HIGHWAY WORK PROPOSAL

Proposal Number: Ø 1

Wisconsin Department of Transportation
DT1502 10/2010 s.66.29(7) Wis. Stats.

COUNTY	STATE PROJECT ID	FEDERAL PROJECT ID	PROJECT DESCRIPTION	HIGHWAY
Milwaukee	1060-33-80	WISC 2014 314	Zoo IC - Zoo Interchange Phase 1 Lincoln - Bluemound, 121st to 70th	USH 45

ADDENDUM REQUIRED

ATTACHED AT BACK

This proposal, submitted by the undersigned bidder to the Wisconsin Department of Transportation, is in accordance with the advertised request for proposals. The bidder is to furnish and deliver all materials, and to perform all work for the improvement of the designated project in the time specified, in accordance with the appended Proposal Requirements and Conditions.

Proposal Guaranty Required, $ 1,000,000.00 Payable to: Wisconsin Department of Transportation	Attach Proposal Guaranty on back of this PAGE.
Bid Submittal Due Date: August 26, 2014 Time (Local Time): 9:00 AM	Firm Name, Address, City, State, Zip Code **SAMPLE** **NOT FOR BIDDING PURPOSES**
Contract Completion Time June 26, 2016	
Assigned Disadvantaged Business Enterprise Goal 8%	This contract is subject to federal oversight.

This certifies that the undersigned bidder, duly sworn, is an authorized representative of the firm named above; that the bidder has examined and carefully prepared the bid from the plans, Highway Work Proposal, and all addenda, and has checked the same in detail before submitting this proposal or bid; and that the bidder or agents, officer, or employees have not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal bid.

Do not sign, notarize, or submit this Highway Work Proposal when submitting an electronic bid on the Internet.

Subscribed and sworn to before me this date _____

(Signature, Notary Public, State of Wisconsin)	(Bidder Signature)
(Print or Type Name, Notary Public, State Wisconsin)	(Print or Type Bidder Name)
(Date Commission Expires)	(Bidder Title)

Notary Seal

For Department Use Only

Type of Work Removals, excavation common, base aggregate, concrete pavement, HMA pavement, concrete barrier, concrete curb and gutter, concrete sidewalks and driveways, storm sewer, erosion control, traffic control, pavement marking, sign structures, permanent signing, lighting, ITS, traffic signals, bridges, retaining walls, restoration, and other incidental items.	
Notice of Award Dated	Date Guaranty Returned

PLEASE ATTACH
PROPOSAL GUARANTY HERE

Effective with November 2007 Letting

PROPOSAL REQUIREMENTS AND CONDITIONS

The bidder, signing and submitting this proposal, agrees and declares as a condition thereof, to be bound by the following conditions and requirements.

If the bidder has a corporate relationship with the proposal design engineering company, the bidder declares that it did not obtain any facts, data, or other information related to this proposal from the design engineering company that was not available to all bidders.

The bidder declares that they have carefully examined the site of, and the proposal, plans, specifications and contract forms for the work contemplated, and it is assumed that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of the specifications, special provisions and contract. It is mutually agreed that submission of a proposal shall be considered conclusive evidence that the bidder has made such examination.

The bidder submits herewith a proposal guaranty in proper form and amount payable to the party as designated in the advertisement inviting proposals, to be retained by and become the property of the owner of the work in the event the undersigned shall fail to execute the contract and contract bond and return the same to the office of the engineer within fourteen (14) days after having been notified in writing to do so; otherwise to be returned.

The bidder declares that they understand that the estimate of quantities in the attached schedule is approximate only and that the attached quantities may be greater or less in accordance with the specifications.

The bidder agrees to perform the said work, for and in consideration of the payment of the amount becoming due on account of work performed, according to the unit prices bid in the following schedule, and to accept such amounts in full payment of said work.

The bidder declares that all of the said work will be performed at their own proper cost and expense, that they will furnish all necessary materials, labor, tools, machinery, apparatus, and other means of construction in the manner provided in the applicable specifications and the approved plans for the work together with all standard and special designs that may be designed on such plans, and the special provisions in the contract of which this proposal will become a part, if and when accepted. The bidder further agrees that the applicable specifications and all plans and working drawings are made a part hereof, as fully and completely as if attached hereto.

The bidder, if awarded the contract, agrees to begin the work not later than ten (10) days after the date of written notification from the engineer to do so, unless otherwise stipulated in the special provisions.

The bidder declares that if they are awarded the contract, they will execute the contract agreement and begin and complete the work within the time named herein, and they will file a good and sufficient surety bond for the amount of the contract for performance and also for the full amount of the contract for payment.

The bidder, if awarded the contract, shall pay all claims as required by Section 779.14, Statutes of Wisconsin, and shall be subject to and discharge all liabilities for injuries pursuant to Chapter 102 of the Statutes of Wisconsin, and all acts amendatory thereto. They shall further be responsible for any damages to property or injury to persons occurring through their own negligence or that of their employees or agents, incident to the performance of work under this contract, pursuant to the Standard Specifications for Road and Bridge Construction applicable to this contract.

In connection with the performance of work under this contract, the contractor agrees to comply with all applicable state and federal statutes relating to non-discrimination in employment. No otherwise qualified person shall be excluded from employment or otherwise be subject to discrimination in employment in any manner on the basis of age, race, religion, color, gender, national origin or ancestry, disability, arrest or conviction record (in keeping with s.111.32), sexual orientation, marital status, membership in the military reserve, honesty testing, genetic testing, and outside use of lawful products. This provision shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship. The contractor further agrees to ensure equal opportunity in employment to all applicants and employees and to take affirmative action to attain a representative workforce.

The contractor agrees to post notices and posters setting forth the provisions of the nondiscrimination clause, in a conspicuous and easily accessible place, available for employees and applicants for employment.

If a state public official (section 19.42, Stats.) or an organization in which a state public official holds at least a 10% interest is a party to this agreement, this contract is voidable by the state unless appropriate disclosure is made to the State of Wisconsin Ethics Board.

Effective with August 2007 Letting

BID PREPARATION

Preparing the Proposal Schedule of Items

A General

(1) Obtain bidding proposals as specified in section 102 of the standard specifications prior to 11:45 AM of the last business day preceding the letting. Submit bidding proposals using one of the following methods:

1. Electronic bid on the internet.
2. Electronic bid on a printout with accompanying diskette or CD ROM.
3. Paper bid under a waiver of the electronic submittal requirements.

(2) Bids submitted on a printout with accompanying diskette or CD ROM or paper bids submitted under a waiver of the electronic submittal requirements govern over bids submitted on the internet.

(3) The department will provide bidding information through the department's web site at http://www.dot.wisconsin.gov/business/engrserv/bid-letting-information.htm. The contractor is responsible for reviewing this web site for general notices as well as information regarding proposals in each letting. The department will also post special notices of all addenda to each proposal through this web site no later than 4:00 P.M. local time on the Thursday before the letting. Check the department's web site after 5:00 P.M. local time on the Thursday before the letting to ensure all addenda have been accounted for before preparing the bid. When bidding using methods 1 and 2 above, check the Bid Express™ on-line bidding exchange at http://www.bidx.com/ after 5:00 P.M. local time on the Thursday before the letting to ensure that the latest schedule of items Expedite file (*.ebs or *.00x) is used to submit the final bid.

(4) Interested parties can subscribe to the Bid Express™ on-line bidding exchange by following the instructions provided at the www.bidx.com web site or by contacting:

Info Tech Inc.
5700 SW 34th Street, Suite 1235
Gainesville, FL 32608-5371
email: mailto:customer.support@bidx.com

(5) The department will address equipment and process failures, if the bidder can demonstrate that those failures were beyond their control.

(6) Contractors are responsible for checking on the issuance of addenda and for obtaining the addenda. Notice of issuance of addenda is posted on the department's web site at http://www.dot.wisconsin.gov/business/engrserv/bid-letting-information.htm or by calling the department at (608) 266-1631. Addenda can ONLY be obtained from the departments web site listed above or by picking up the addenda at the Bureau of Highway Construction, Room 601, 4802 Sheboygan Avenue, Madison, WI, during regular business hours.

B Submitting Electronic Bids

B.1 On the Internet

(1) Do the following before submitting the bid:

1. Have a properly executed annual bid bond on file with the department.
2. Have a digital ID on file with and enabled by Info Tech Inc. Using this digital ID will constitute the bidder's signature for proper execution of the bidding proposal.

(2) In lieu of preparing, delivering, and submitting the proposal as specified in 102.6 and 102.9 of the standard specifications, submit the proposal on the internet as follows:

1. Download the latest schedule of items reflecting all addenda from the Bid Express™ web site.
2. Use Expedite™ software to enter a unit price for every item in the schedule of items.
3. Submit the bid according to the requirements of Expedite™ software and the Bid Express™ web site. Do not submit a bid on a printout with accompanying diskette or CD ROM or a paper bid. If the bidder does submit a bid on a printout with accompanying diskette or a paper bid in addition to the internet submittal, the department will disregard the internet bid.
4. Submit the bid before the hour and date the Notice to Contractors designates.
5. Do not sign, notarize, and return the bidding proposal described in 102.2 of the standard specifications.

(3) The department will not consider the bid accepted until the hour and date the Notice to Contractors designates.

B.2 On a Printout with Accompanying Diskette or CD ROM

(1) Download the latest schedule of items from the Wisconsin pages of the Bid Express™ web site reflecting the latest addenda posted on the department's web site at **http://www.dot.wisconsin.gov/business/engrserv/bid-letting-information.htm**. Use Expedite ™ software to prepare and print the schedule of items. Provide a valid amount for all price fields. Follow instructions and review the help screens provided on the Bid Express™ web site to assure that the schedule of items is prepared properly.

(2) Staple an 8 1/2 by 11 inch printout of the Expedite™ generated schedule of items to the other proposal documents submitted to the department as a part of the bidder's sealed bid. As a separate submittal not in the sealed bid envelop but due at the same time and place as the sealed bid, also provide the Expedite™ generated schedule of items on a 3 1/2 inch computer diskette or CD ROM. Label each diskette or CD ROM with the bidder's name, the 4 character department-assigned bidder identification code from the top of the bidding proposal, and a list of the proposal numbers included on that diskette or CD ROM as indicated in the following example:

Bidder Name

BN00

Proposals: 1, 12, 14, & 22

(3) If bidding on more than one proposal in the letting, the bidder may include all proposals for that letting on one diskette or CD ROM. Include only submitted proposals with no incomplete or other files on the diskette or CD ROM.

(4) The bidder-submitted printout of the Expedite™ generated schedule of items is the governing contract document and must conform to the requirements of section 102 of the standard specifications. If a printout needs to be altered, cross out the printed information with ink or typewriter and enter the new information and initial it in ink. If there is a discrepancy between the printout and the diskette or CD ROM, the department will analyze the bid using the printout information.

(5) In addition to the reasons specified in section 102 of the standard specifications, proposals are irregular and the department may reject them for one or more of the following:

1. The check code printed on the bottom of the printout of the Expedite™ generated schedule of items is not the same on each page.
2. The check code printed on the printout of the Expedite™ generated schedule of items is not the same as the check code for that proposal provided on the diskette or CD ROM.

3. The diskette or CD ROM is not submitted at the time and place the department designates.

C Waiver of Electronic Submittal

(1) The bidder may request a waiver of the electronic submittal requirements. Submit a written request for a waiver in lieu of bids submitted on the internet or on a printout with accompanying diskette or CD ROM. Use the waiver that was included with the paper bid document sent to the bidder or type up a waiver on the bidder's letterhead. The department will waive the electronic submittal requirements for a bidding entity (individual, partnership, joint venture, corporation, or limited liability company) for up to 4 individual proposals in a calendar year. The department may allow additional waivers for equipment malfunctions.

(2) Submit a schedule of items on paper conforming to section 102 of the standard specifications. The department charges the bidder a $75 administrative fee per proposal, payable at the time and place the department designates for receiving bids, to cover the costs of data entry. The department will accept a check or money order payable to: "Wisconsin, Dept. of Transportation."

(3) In addition to the reasons specified in section 102 of the standard specifications, proposals are irregular and the department may reject them for one or more of the following:

1. The bidder fails to provide the written request for waiver of the electronic submittal requirements.
2. The bidder fails to pay the $75 administrative fee before the time the department designates for the opening of bids unless the bidder requests on the waiver that they be billed for the $75.
3. The bidder exceeds 4 waivers of electronic submittal requirements within a calendar year.

(4) In addition to the reasons specified in section 102 of the standard specifications, the department may refuse to issue bidding proposals for future contracts to a bidding entity that owes the department administrative fees for a waiver of electronic submittal requirements.

PROPOSAL BID BOND

Wisconsin Department of Transportation

DT1303 1/2006

Proposal Number	Project Number	Letting Date
Name of Principal		
Name of Surety	State in Which Surety is Organized	

We, the above-named Principal and the above-named Surety, are held and firmly bound unto the State of Wisconsin in the sum equal to the Proposal Guaranty for the total bid submitted for the payment to be made; we jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. The condition of this obligation is that the Principal has submitted a bid proposal to the State of Wisconsin acting through the Department of Transportation for the improvement designated by the Proposal Number and Letting Date indicated above.

If the Principal is awarded the contract and, within the time and manner required by law after the prescribed forms are presented for signature, enters into a written contract in accordance with the bid, and files the bond with the Department of Transportation to guarantee faithful performance and payment for labor and materials, as required by law, or if the Department of Transportation shall reject all bids for the work described, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect. In the event of failure of the Principal to enter into the contract or give the specified bond, the Principal shall pay to the Department of Transportation **within 10 business days of demand** a total equal to the Proposal Guaranty as liquidated damages; the liability of the Surety continues for the full amount of the obligation as stated until the obligation is paid in full.

The Surety, for value received, agrees that the obligations of it and its bond shall not be impaired or affected by any extension of time within which the Department of Transportation may accept the bid; and the Surety does waive notice of any such extension.

IN WITNESS, the Principal and Surety have agreed and have signed by their proper officers and have caused their corporate seals to be affixed this date: **(DATE MUST BE ENTERED)**

PRINCIPAL

(Company Name) **(Affix Corporate Seal)**

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

NOTARY FOR PRINCIPAL

(Date)

State of Wisconsin)
) ss.
_____ County)

On the above date, this instrument was acknowledged before me by the named person(s).

(Signature, Notary Public, State of Wisconsin)

(Print or Type Name, Notary Public, State of Wisconsin)

(Date Commission Expires)

Notary Seal

(Name of Surety) **(Affix Seal)**

(Signature of Attorney-in-Fact)

NOTARY FOR SURETY

(Date)

State of Wisconsin)
) ss.
_____ County)

On the above date, this instrument was acknowledged before me by the named person(s).

(Signature, Notary Public, State of Wisconsin)

(Print or Type Name, Notary Public, State of Wisconsin)

(Date Commission Expires)

Notary Seal

IMPORTANT: A certified copy of Power of Attorney of the signatory agent must be attached to the bid bond.

CERTIFICATE OF ANNUAL BID BOND

Wisconsin Department of Transportation

DT1305 8/2003

Time Period Valid (From/To)
Name of Surety
Name of Contractor
Certificate Holder Wisconsin Department of Transportation

This is to certify that an annual bid bond issued by the above-named Surety is currently on file with the Wisconsin Department of Transportation.

This certificate is issued as a matter of information and conveys no rights upon the certificate holder and does not amend, extend or alter the coverage of the annual bid bond.

Cancellation: Should the above policy be cancelled before the expiration date, the issuing surety will give thirty (30) days written notice to the certificate holder indicated above.

(Signature of Authorized Contractor Representative) (Date)

March 2010

LIST OF SUBCONTRACTORS

Section 66.0901(7), Wisconsin Statutes, provides that as a part of the proposal, the bidder also shall submit a list of the subcontractors the bidder proposes to contract with and the class of work to be performed by each. In order to qualify for inclusion in the bidder's list a subcontractor shall first submit a bid in writing, to the general contractor at least 48 hours prior to the time of the bid closing. The list may not be added to or altered without the written consent of the municipality. A proposal of a bidder is not invalid if any subcontractor and the class of work to be performed by the subcontractor has been omitted from a proposal; the omission shall be considered inadvertent or the bidder will perform the work personally.

No subcontract, whether listed herein or later proposed, may be entered into without the written consent of the Engineer as provided in Subsection 108.1 of the Standard Specifications.

Name of Subcontractor	Class of Work	Estimated Value

DECEMBER 2000

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS - PRIMARY COVERED TRANSACTIONS

Instructions for Certification

1. By signing and submitting this proposal, the prospective contractor is providing the certification set out below.

2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective contractor shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective contractor to furnish a certification or an explanation shall disqualify such person from participation in this transaction.

3. The certification in this clause is a material representation of fact upon which reliance was placed when the department determined to enter into this transaction. If it is later determined that the contractor knowingly rendered an erroneous certification in addition to other remedies available to the Federal Government the department may terminate this transaction for cause or default.

4. The prospective contractor shall provide immediate written notice to the department to whom this proposal is submitted if at any time the prospective contractor learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department to which this proposal is being submitted for assistance in obtaining a copy of those regulations.

6. The prospective contractor agrees by submitting this proposal that, should this contract be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department entering into this transaction.

7. The prospective contractor further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," which is included as an addendum to PR-1273 - "Required Contract Provisions Federal Aid Construction Contracts," without

modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

8. The contractor may rely upon a certification of a prospective subcontractor/materials supplier that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A contractor may decide the method and frequency by which it determines the eligibility of its principals. Each contractor may, but is not required to, check the Disapproval List (telephone # 608/266/1631).

9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

10. Except for transactions authorized under paragraph 6 of these instructions, if a contractor in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

(1) The prospective contractor certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offense enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective contractor is unable to certify to any of the statements in this certification, such prospective contractor shall attach an explanation to this proposal.

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SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 1060-33-80, Zoo IC – Zoo Interchange Phase 1, Lincoln – Bluemound, 121st to 70th, USH 45, Milwaukee County, Wisconsin as the plans show and execute the work as specified in the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 2014 Edition, as published by the department, and these special provisions.

Perform the sanitary sewer and water main work in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest Edition (SSSW). If there is a discrepancy or conflict between the referenced specification and the standard specifications regarding contract administration, part 1 of the standard specifications governs.

If all or a portion of the plans and special provisions are developed in the SI metric system and the schedule of prices is developed in the US standard measure system, the department will pay for the work as bid in the US standard system.
100-005 (20130615)

2. Scope of Work.

The work under this contract shall consist of removals, grading, dense graded base, concrete pavement, concrete curb and gutter, concrete sidewalk, concrete barrier, asphaltic surface, HMA pavement, asphaltic base, storm sewer, sanitary sewer, water main, erosion control, permanent signing, traffic signals, traffic control, pavement marking, street lighting, structures, bridges, retaining walls, noise barriers, overhead sign structures, restoration, and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract.

Structures:

Bridges

B-40-537	B-40-538	B-40-789	B-40-791
B-40-798	B-40-849	B-40-852	B-40-855
B-40-857	B-40-862	B-40-863	B-40-864
B-40-866	B-40-891		

Noise Barriers

N-40-62	N-40-68	N-40-69	N-40-70
N-40-71	N-40-72	N-40-73	N-40-74
N-40-75	N-40-80	N-40-81	

Retaining Walls

R-40-501	R-40-504	R-40-511	R-40-514
R-40-522	R-40-523	R-40-524	R-40-525
R-40-536	R-40-546	R-40-548	R-40-551
R-40-552	R-40-554	R-40-555	R-40-556
R-40-557	R-40-560	R-40-618	R-40-619
R-40-620			

Sign Structures

S-40-22	S-40-27	S-40-28	S-40-43
S-40-44	S-40-47	S-40-50	S-40-51
S-40-65	S-40-85	S-40-87	S-40-104
S-40-116	S-40-117	S-40-118	S-40-119
S-40-121	S-40-122	S-40-124	S-40-129
S-40-130	S-40-131	S-40-132	S-40-134
S-40-135	S-40-136	S-40-137	S-40-146
S-40-147	S-40-148	S-40-149	S-40-158
S-40-443	S-40-444	S-40-788	S-40-789
S-40-790	S-40-989	S-40-991	S-40-992
S-40-993	S-40-995	S-40-996	

104-005 (20090901)

3. Mandatory Pre-Bid Meeting.

Supplement standard spec 102.3.1 with the following:

Prospective bidders are required to attend a mandatory pre-bid meeting on Thursday, July 17, 2014 from 1:00 PM to 4:00 PM in the Hall of Fame Room of the Pettit National Ice Center, located at 500 S. 84th Street, Milwaukee, Wisconsin 53214.

The meeting agenda will include the following:

- Corridor Overview
- Zoo IC – Zoo Interchange Phase 1

The meeting will discuss project specific issues for IDs 1060-33-80.

- The Owner Controlled Insurance Program (OCIP)

The Zoo Interchange project will be constructed under the umbrella of an Owner Controlled Insurance Program (OCIP). Contractor/Consultant participation in this Corridor Project is mandatory and requires enrollment into the OCIP.

This meeting will provide understanding of the coverage provided by the OCIP, the bid deduction process and the coverage needed outside of the OCIP. It is critical that CFO's, Risk Manager/Insurance Broker or Agent, and Estimators attend this meeting.

Please contact Kay Millonzi at (608) 267-7722 with any questions regarding the OCIP.

- Safety
- Contractor Compliance
- DBE Business Outreach Provision

No meeting minutes will be prepared, but a published response will be sent out addressing all questions raised at the meeting.
SEF Rev. 14_0519

4. Prosecution and Progress.

Begin work within ten calendar days after the engineer issues a written notice to do so.

Provide the start date to the engineer in writing within a month after executing the contract but at least 14 calendar days before the preconstruction conference. Upon approval, the engineer will issue the notice to proceed within ten calendar days before the approved start date.

To revise the start date, submit a written request to the engineer at least two weeks before the intended start date. The engineer will approve or deny that request based on the conditions cited in the request and its effect on the department's scheduled resources.

The completion date is based on an expedited work schedule and may require extraordinary forces and equipment; work on Saturdays, Sundays, and nationally recognized legal holidays; and work at night.

Indicate on the proposed schedule of operations that a large force and adequate equipment will be needed to assure that the work will be completed within the established contract time.

Be advised that there may be multiple mobilizations and/or remobilizations to complete construction operations, for example such items as: concrete pavement repair/replacement, paving, traffic control, signing, pavement marking, finishing items and other incidental items. No additional payment will be made, by the department, for additional mobilizations.

Winter weather work, grading, excavation of frozen ground, high ground water, dewatering during winter months, and mitigation efforts for high water table elevations shall not be considered adverse weather delays to construction. Cost for dewatering is considered incidental to construction.

Anticipate cold weather, late fall and early spring concrete paving and ancillary concrete work (curb, median, etc), and winter concrete work. Plan to heat aggregates and water for mixes, and that the heating of the aggregate and water is considered incidental to those concrete items. There will be no adverse weather delay for cold weather construction.

After written notice to proceed, and prior to Final Acceptance of the work, assist with maintenance of existing roadways and bridges as specified in standard spec 104.6.1. This assistance may include performance of work covered under pay items or accommodating local repair forces within the work zones. Maintain all newly constructed work as specified in standard spec 104.6.1.

Place topsoil in all graded areas as designated by the engineer immediately after grading has been completed. Fertilize, seed and mulch or fertilize and sod all areas within five calendar days after placement of topsoil.

CPM Progress Schedule
Refer to the Baseline CPM Progress Schedule items elsewhere in these special provisions.

Schedule of Operations
Traffic shifts shown in a given stage may occur at different times during that stage depending on the controlling elements for a given traffic movement. The department anticipates that the schedule for each stage shall be as follows:

Anticipated schedule:

For the purpose of schedule,

Section 1 is defined as all areas not included in Section 2.

Section 2 (East Leg) is defined as all freeway and local road work areas adjacent to I-94, crossing I-94, and including the I-94 freeway east of Station 195EW+00

Do not move to the next stage until all work in the current stage is completed or as approved by the engineer.

Section 1 and Section 2 (East Leg)

Stage 1A Construction:

Freeway and Ramp Construction

- Begin construction of B-40-852, B-40-857 and B-40-891
- Begin construction of R-40-511, R-40-514, R-40-546, R-40-548, R-40-557 and R-40-560
- Begin Ramp NW roadway construction
- Construct northbound widening NSC
- Remove portion of B-40-106
- Remove B-40-88
- Construct storm sewer Z4000, P4000A, Z4001, P4001A, Z4002, P4002A, Z4004, P4005, Z4007, P4007A, Z4016, and P4017 prior to B-40-891 and R-40-501 construction
- Construct storm sewer Z7654 through Z7687A prior to R-40-557 construction
- Construct storm sewer by tunnel excavation from Z2822 through Z2815
- Construct storm sewer Z6124 through Z6086 through P6198A prior to wall R-40-548 construction
- Construct storm sewer P7654E through P7686B with Backfill Controlled Low Strength from pipe invert to subgrade elevation for a width of 2 times the outside pipe diameter prior to wall R-40-557 construction
- Construct Watertown Plank Road Ramp WE grading

Local Road Construction

W. Bluemound Road

- Remove B-40-129 and B-40-130
- Begin construction of B-40-866

W. Adler Street

- Reconstruct utilities

W. Chester Street

- Construct R-40-618
- Reconstruct utilities

S. 84th Street

- Coordinate and remove portion of B-40-93 for construction of storm sewer P6853 through Z6764

W. O'Connor Street

- Construct R-40-620

W. National Avenue

- Install CCTV-40-0209

Stage 1B Construction:

Freeway and Ramp Construction

- Continue construction of B-40-852, B-40-857 and B-40-891
- Continue construction of R-40-511, R-40-514, R-40-546, R-40-548, R-40-557 and R-40-560
- Continue Ramp NW roadway construction
- Continue storm sewer construction
- Construct southbound widening NSE
- Begin construction of R-40-556
- Construct median storm sewer at W. Bluemound Road prior to B-40-866 pier construction
- Construct median storm sewer between 72nd and 79th Streets
- Construct P6716A, ZT6431, and PT6430 under nighttime lane closures after Ramp FA storm sewer trunk is constructed, prior to removing existing Honey Creek box culvert

Local Road Construction

W. Bluemound Road

- Continue construction of B-40-866
- Begin roadway construction

S. 95th Street

- Begin roadway construction
- Construct storm sewer

S. 84th Street

- Construct storm sewer from Z6764 through Z6725
- Install fiber optic cable on 84th Street to EXCV38F
- Begin roadway construction

Stage 1C Construction:

Freeway and Ramp Construction

- Continue construction of B-40-852, B-40-857 and B-40-891
- Continue construction of R-40-511, R-40-514, R-40-546, R-40-548, R-40-557, R-40-560 and R-40-556
- Continue Ramp NW roadway construction
- Continue storm sewer construction

Local Road Construction

W. Bluemound Road

- Continue construction of B-40-866
- Continue roadway construction

S. 95th Street

- Continue roadway construction

S. 84th Street

- Continue roadway construction

Stage 2A Construction:

Freeway and Ramp Construction

- Continue construction of B-40-849, B-40-852, B-40-857 and B-40-891
- Continue construction of R-40-511, R-40-514, R-40-546, R-40-548, R-40-560 and R-40-556
- Continue Ramp NW roadway construction
- Begin construction of R-40-525 and R-40-524
- Remove B-40-95, B-40-98, B-40-99 and B-40-755
- Begin construction of B-40-789, B-40-798, B-40-849, B-40-855, B-40-791, B-40-537 and B-40-538
- Begin USH 45 SB roadway construction
- Begin IH 94 roadway construction
- Remove B-40-92
- Construct B-40-863
- Construct R-40-551, R-40-552 and R-40-555
- Continue removal of B-40-93
- Construct storm sewer Z3146 and P3147 prior to R-40-504 construction
- Construct storm sewer Z2683, P2684, Z2791, and P2792 prior to R-40-524, B-40-849 and B-40-798 construction
- Construct storm sewer P6354 through Z6374 with coordinated ramp closure for eastbound IH 94 off ramp to S. 84th Street.
- Construct storm sewer by tunnel excavation from Z2815 through Z2683 prior to R-40-525, R-40-524, and B-40-849 construction

Local Road Construction

W. Bluemound Road

- Continue construction of B-40-866
- Continue roadway construction

S. 95th Street

- Continue roadway construction

W. Adler Street

- Begin roadway construction

W. Chester Street

- Construct roadway

S. 92nd Street

- Begin construction of B-40-862
- Begin roadway construction

S. 84th Street

- Continue roadway construction

W. O'Connor Street

- Construct roadway

Stage 2B/2C Construction:

Freeway and Ramp Construction

- Continue construction of B-40-789, B-40-849, B-40-852, B-40-857 and B-40-891
- Continue construction of R-40-511, R-40-514, R-40-546, R-40-548, R-40-560 and R-40-556
- Remove span of B-40-106
- Construct storm sewer P4047 from ZE4046 and construct the portion under Ramp SA, complete P4047 construction prior to eastbound traffic shift
- Continue Ramp NW roadway construction
- Continue construction of R-40-525 and R-40-524
- Continue construction of B-40-798, B-40-855, B-40-791, B-40-537 and B-40-538
- Continue USH 45 SB roadway construction
- Continue IH 94 roadway construction
- Construct B-40-863
- Construct R-40-551, R-40-552 and R-40-555
- Continue removal of B-40-93
- Continue constructing storm sewer Z3146 and P3147 prior to R-40-504 construction
- Construct cross-overs at STH 100

Local Road Construction

W. Bluemound Road

- Continue construction of B-40-866
- Continue roadway construction

S. 95th Street

- Continue roadway construction

W. Adler Street

- Continue roadway construction

W. Chester Street

- Continue roadway construction

S. 92nd Street
- Continue construction of B-40-862
- Continue roadway construction

S. 84th Street
- Continue roadway construction

W. O'Connor Street
- Continue roadway construction

Stage 3A Construction:

Freeway and Ramp Construction
- Continue construction of B-40-849, B-40-852, B-40-857 and B-40-891
- Continue construction of R-40-511, R-40-514, R-40-546, R-40-548, R-40-560, and R-40-556
- Continue Ramp NW roadway construction
- Remove remainder of B-40-106
- Continue construction of R-40-525 and R-40-524
- Continue construction of B-40-798, B-40-855, B-40-791, B-40-537 and B-40-538
- Continue USH 45 SB roadway construction
- Continue IH 94 roadway construction
- Remove B-40-91 and B-40-131
- Continue removal of B-40-93
- Construct storm sewer Z4283, P4284, Z4285, P4286,Z4289, P4290, Z4291, P4292, Z4295, P4296,Z4297, P4298, and Z4201 prior to R-40-536 construction
- Construct storm sewer P2714, Z2717, P2718, Z2721, P 2722, and Z2723 prior to R-40-849 and R-40-524 construction
- Construct P7886 through P7892 with Backfill Controlled Low Strength from pipe invert to subgrade elevation for a width of 2 times the outside pipe diameter due to wall R-40-558 construction under contract 1060-33-81

Local Road Construction

W. Adler Street
- Continue roadway construction

W. Chester Street
- Continue roadway construction

S. 92nd Street
- Continue construction of B-40-862
- Continue roadway construction

Section 1:

Section 1 Stage 4A Construction:

Freeway and Ramp Construction

- Continue construction of B-40-798, B-40-855, B-40-791, B-40-537, B-40-538 and B-40-849
- Continue construction of R-40-525
- Continue USH 45 SB roadway construction
- Begin IH 894/USH 45 NB roadway construction

S. 92nd Street

- Continue construction of B-40-862
- Continue roadway construction

Section 1 Stage 5A Construction:

Freeway and Ramp Construction

- Construct median gaps

Local Road Construction

- None

Section 1 Stage 5B Construction:

Final configuration

Freeway and Ramp Construction

- None

Local Road Construction

- None

Section 2 (East Leg)

Section 2 (East Leg) Stage 3B Construction:

Freeway and Ramp Construction

- None (Winter Shut Down)

Local Road Construction

- None (Winter Shut Down)

Section 2 (East Leg) Stage 4A/4B Construction:

Freeway and Ramp Construction

- Remove B-40-90
- Construct B-40-864
- Continue construction of R-40-551, R-40-552 and R-40-554
- Continue IH 94 roadway construction

Local Road Construction

S. 84th Street
- Continue roadway construction
- Construct R-40-619

Kearney Street
- Continue roadway construction

Section 2 (East Leg) Stage 5A Construction:

Freeway and Ramp Construction
- Construct median gaps
- Reconstruct IH 94 EB median shoulders
- Mill and overlay IH 94 EB roadway at east end of project

Local Road Construction
- None

Section 2 (East Leg) Stage 5B Construction:

Final configuration

Freeway and Ramp Construction
- None

Local Road Construction
- None

Contractor Coordination

Provide an individual to serve as the contractor's sole point of contact for field utility coordination and communication for the duration of the project.
SEF Rev. 13_1107

To minimize service outages during construction the existing 16-inch water main on 92nd Street bridge, between W. Chester Street and Adler Street, shall not be shut off or abandoned prior to the replacement and establishment of the new 16-inch water main loop serving the area. The following water main work and associated water services shall be installed, tested, connected, and in service as part of the new 16-inch water main loop;

- In W. Adler Street, from S. 91st Street to S. 95th Street;
- In W. Chester Street, from S. 92nd Street to S. 91st Street Extended water main;
- In S. 91st Street extended water main, from W. Chester Street to W. Adler Street.

The existing 12-inch water main crossing the highway at S. 87th Place extended shall remain in service until the aforementioned work is completed. Simultaneous water main shutoffs at S. 87th Place extended and the 92nd Street bridge are prohibited. Contact Josh

Iwen, (414) 286-3640, of City of Milwaukee - Water ten business days in advance to coordinate outages of their facilities. Staging changes are not allowed unless reviewed by Milwaukee Water Works and approved by the engineer.

The City of Milwaukee has an existing 16-inch water main crossing IH 94 near S. 92nd Street at Station 211EW+02 and an existing 12-inch water main crossing IH 94 near S. 88th Street at Station 224EW+87. Both crossings will be reconstructed as shown in the plans. Only one of these crossings can be taken out of service at a time. Reconstruct and adjust the water mains as shown in the plans. Contact Josh Iwen, (414) 286-3640, of City of Milwaukee - Water ten business days in advance to coordinate outages of their facilities.

The City of Milwaukee Water Utility staff will inspect the construction of water main under this contract. Notify Steve Brengosz, (414) 708-2808, or Mark Scheller,(414) 286-2427, for materials inspection and the City of Milwaukee Construction Section. (414) 286-2497, for installation inspection four business days prior to starting construction.

The existing Adler Water Booster Station near Adler Street and S. 87th Place that is being relocated to Adler and S. 85th Street as shown in the plans. A City of Milwaukee communications duct package serving this booster station crosses IH 94 as an attachment to the S. 92nd Street structure and then runs easterly along the north curb line of W. Adler Street to the existing booster station. This duct package cannot be disturbed until communications can be re-established to the station from the east along S. 84th Street and Adler Street as follows: Construct, reconstruct and adjust City of Milwaukee communications facilities along O'Connor Street, S. 84th Street and Adler Street as shown in the plans. Upon completion of the communications facilities in the S. 84th Street area, City of Milwaukee staff will splice the reinstalled cable and fiber lines. Allow 30 calendar days for City of Milwaukee staff to complete the splicing. Coordinate construction activities with City of Milwaukee. Provide written notice to Brian Pawlak, (414) 286-5970, of the City of Milwaukee 10 business days in advance to coordinate construction activities. Communications to the existing Adler Water Booster Station must be maintained at all times, including during the construction, testing and approval of the Relocated Booster Station.

City of Milwaukee has an existing communications line attached below the Bluemound Road structure over USH 45. Construct, reconstruct and adjust the communications facilities at Bluemound Road and USH 45 as shown in the plans. City of Milwaukee staff will splice the reinstalled communications lines. Allow 30 calendar days for City of Milwaukee staff to complete the splicing. Coordinate construction activities with City of Milwaukee. Provide written notice to Brian Pawlak, (414) 286-5970, of the City of Milwaukee ten business days in advance to coordinate construction activities.

Coordinate traffic signal reconstruction at N. 95th Street and Bluemound Road and at N. 97th Street and Bluemound Road with the City of Milwaukee – Signals staff. The City of Milwaukee will remove the signals at these two intersections and will reinstall signals at N. 95th Street and Bluemound Road. Allow 5 calendar days for City staff to perform signal

removals and 5 calendar days for signal installation. Provide written notice to Joseph Blakeman, (414) 286-8070, or Al Nichols. (414) 286-3686, of the City of Milwaukee 10 business days in advance to coordinate construction activities.

A City of Wauwatosa sanitary sewer will be reconstructed near 97th Street and Wisconsin Avenue. Reconstruction of that portion of the sewer crossing Wisconsin Avenue between a manhole at Station 24WX+49, 23' RT and an MMSD manhole at Station 24WX+49, 10' LT must be completed in 7 calendar days. Reconstruction of this portion of sewer must be performed during off peak hours. Construct the sanitary sewer as shown in the plans.

AT&T Wisconsin has transite conduit packages attached below the S. 92nd Street structure over IH 94, and attached below the Bluemound Road and Wisconsin Avenue structures over USH 45. They will remove the transite conduit in conjunction with the structure demolition. Allow AT&T Wisconsin two nights in each location to complete their removals. Provide the necessary traffic control devices and lane closures for them to complete their work. Lane rental assessments will apply to these closures. Provide written notice to Jay Bulanek, (414) 535-7407 office, of AT&T Wisconsin 21 business days in advance to coordinate transite removal activities.

American Transmission Company will be constructing overhead electric transmission towers and pulling new overhead circuits during construction. Once temporary barrier is placed in Stage 1A for the east to north ramp from Station 810BB+69, 26' LT to Wisconsin Avenue but before Stage 1B, allow American Transmission Company 5 business days to install the foundation at Station 811BB+79, 28' LT. Contact William Aeschbacher, (262) 506-6918 office / (262) 364-8356 cell, of We Energies 10 business days in advance to coordinate foundation work.

We Energies - Electric has an underground electric duct package running in the median of S. 84th Street, crossing IH 94 at Station 237EW+85, and an overhead pole line that runs along the east side of S. 84th Street which crosses IH 94 at Station 238EW+11 that cannot be taken out of service simultaneously. We Energies will place all underground conductors in the duct package to the overhead line prior to construction. Once the existing box culvert has been removed and the proposed storm sewer (P6765) crossing S. 84th Street has been installed, allow We Energies 30 calendar days to re-establish their underground duct package, install electric cable, and perform associated splice work. After the completion of the re-establishing of underground electric feeders, allow We Energies 15 calendar days to remove the overhead electric lines crossing IH 94. Contact Amy Plato, (414) 385-6149 office / (414) 335-7543 cell, of We Energies ten business days in advance to coordinate outages of their facilities.

We Energies - Electric has transite conduit packages attached below the S. 92nd Street structure over IH 94, and attached below the Bluemound Road and Wisconsin Avenue structures over USH 45. They will remove the transite conduit in conjunction with the structure demolition. Allow We Energies two nights in each location to complete their removals. Provide the necessary traffic control devices and lane closures for them to complete their work. Lane rental assessments will apply to these closures. Provide written

notice to Amy Plato, (414) 385-6149 office / (414) 335-7543 cell, of We Energies 21 business days in advance to coordinate transite removal activities.

Advance Notification
Notify the engineer if there are any changes in the schedule, early completions, or cancellations of scheduled work. Coordinate the locations of messages of portable changeable message sign with the engineer and WisDOT STOC. Notify the engineer of proposed changes for alternate routes and detours and provide a revised signing plan for the review by and approval of the engineer.

Provide the engineer with a schedule of lane and ramp closures for the following week by 9:00 AM on Wednesday of the previous week. In addition, provide the following minimum advance notification to the engineer for incorporation into the Wisconsin Lane Closure System.

Service Ramp Closures	3 business days
Short Term System Ramp Closures	7 calendar days
Lane Closures	3 business days
Full Freeway Closures	14 calendar days
Construction Stage Changes	14 calendar days
Long Term System Ramp Closures	14 calendar days
Detours	14 calendar days

Obtain prior acceptance from the engineer and the WisDOT Statewide Traffic Operations Center for Full Freeway Closures. Notify local emergency and police agencies seven calendar days prior to freeway closure.

Notify the residents that live along Adler Street and along Chester Street five business days in advance of restricting access to their houses for the purpose of concrete paving operations.

Notify the engineer and Karl Hackbarth of the Milwaukee County Zoo at (414) 256-5413 five business days in advance of commencing any work that affects the Milwaukee County Zoo property.

Ramp Closures
All entrance and exit ramps shall be posted three business days in advance of their closure with dates and time of closure.

No two consecutive entrance ramps or consecutive exit ramps may be closed unless it is shown in the traffic control plans or approved by the engineer.

Portable Changeable Message Signs
Obtain acceptance from the engineer regarding the wording of all messages on portable changeable message signs.

Freeway and Ramp Work Restrictions

Definitions

The following definitions apply to this contract for freeway work restrictions:

System Ramps	Freeway to freeway ramps
Service Ramps	Freeway to/from local road ramps

Weekday Peak Hours

- 5:30 AM – 9:00 AM Monday, Tuesday, Wednesday, Thursday, and Friday
- 2:00 PM – 7:00 PM Monday, Tuesday, Wednesday, Thursday, and Friday

Weekday Midday

- 9:00 AM – 2:00 PM Monday, Tuesday, Wednesday, Thursday, and Friday

Weekend Peak Hours

- 10:00 AM – 7:00 PM Saturday, Sunday

Weekend Off-Peak Hours

- 8:00 AM – 10:00 AM Saturday, Sunday
- 7:00 PM – 11:00 PM Saturday
- 7:00 PM – 9:30 PM Sunday

Weekday Off-Peak Hours

- 7:00 PM – 9:30 PM Monday, Tuesday, Wednesday, Thursday
- 7:00 PM – 11:00 PM Friday

Night Time Hours

- 9:30 PM – 5:30 AM (Sunday PM to Monday AM, Monday PM to Tuesday AM, Tuesday PM to Wednesday AM, Wednesday PM to Thursday AM, Thursday PM to Friday AM)
- 11:00 PM – 8:00 AM (Friday PM to Saturday AM, Saturday PM to Sunday AM)

Full Freeway Closure/Hours

- 11:00 PM – 4:30 AM Sunday through Thursday nights
- 11:00 PM – 6 AM Friday and Saturday nights

Do not close freeway lanes or shoulders and ensure that the freeways are entirely clear for traffic during Weekday Peak Hours, Weekday Midday, and Weekend Peak Hours, except as shown in the traffic control plans. One freeway lane and/or the shoulder may be closed, but maintain at least two freeway lanes open to traffic, during Weekday Off-Peak and Weekend Off-Peak Hours. Provide a minimum of one lane in each direction of the freeway that is entirely clear for traffic during Night Time Hours except as allowed during full closure. Close system ramps and service ramps only during Full Freeway Closure time periods,

unless otherwise specified in the plan, or unless otherwise approved by the engineer for safety or operational reasons associated with other adjacent lane or freeway closures.

Follow plan details for closures. Lane restrictions of the freeway beyond that shown on the traffic control plans are subject to lane rental assessments and must be approved by the engineer. If plan details are not provided in the traffic control plan, furnish plans for review by the engineer so that approval, or disapproval, is obtained at least three business days prior to the closure of roadway, lane, and ramp as identified in Contractor Coordination.

Do not, at any time, conduct construction operations in the median area and adjacent outside shoulder area of the freeway at the same time without obtaining prior permission of the engineer, beyond that shown on the traffic control plans.

Rolling Closure
Short term freeway mainline rolling closures may be allowed for a maximum of 15 minutes for the removal and erection of sign structures, equipment moves across the road, or other required work as determined by the engineer. The department will allow short term rolling closures only between 2:00 AM and 4:00 AM, and they may only be performed by freeway law enforcement.

Obtain approval from the engineer before coordinating these closures with freeway law enforcement. Coordinate 14 calendar days in advance of closure. Present the scheduled time for the short term rolling closure at the weekly traffic meeting a minimum of one week prior to the closure.
SEF Rev. 13_0815

Full closure and detouring of freeway roads will be restricted to Full Freeway Closure Hours unless otherwise specified. The freeway may be closed to facilitate the removal of structures and erection of girders, storm sewer trunk line crossings, to perform work related to major traffic shifts and other work approved by the engineer. Provide signed detour routes, as shown in the plans, fully open and free of construction during all full freeway and system ramp closures.

To minimize the total number of full freeway closures for girder erection and bridge demolition activities, contractor is allowed extended full freeway closures between 10:00 PM and 5:00 AM Sunday through Thursday nights and between 11 PM and 7 AM for Friday and Saturday nights. A full freeway closure is defined as one direction of the freeway. Closing both directions of the freeway constitutes using two full freeway closures. A total of forty extended full freeway closures are allowed. Bridge superstructure demolition activities will require a full freeway closure in both directions. Lane rental assessments will apply to these closures. These closures are to be utilized only for bridge demolition and girder erection activities for the following bridges:

- Bluemound Road demolition and reconstruction
- Wisconsin Avenue demolition
- 92nd Street demolition and reconstruction
- SW ramp demolition
- 73rd Street pedestrian bridge demolition
- US 45 northbound temporary bridge over I-94 eastbound
- US 45 northbound temporary bridge over I-94 westbound

Do not close long term Bluemound Rd over USH 45 prior to October 16, 2014, or as directed by the engineer.

Do not close long term the northbound exit ramp to W. Wisconsin Avenue prior to October 16, 2014, or as directed by the engineer.

Do not close any freeway lanes long-term prior to October 16, 2014, or as approved by the engineer.

Complete the landscaping work, including but limited to, tree planting, seeding and mulch, and sodding along the berm south of Greenfield Avenue prior to November 21, 2014.

Do not close long term the existing Ramp SW prior to March 14, 2015, or as approved by the engineer.

Do not close long term the existing Ramp ES prior to March 14, 2015, and prior to the completion of all of the work necessary to activate dynamic message sign mounted on S-40-443, or as approved by the engineer.

Do not close long term Wisconsin Avenue until Bluemound Road is fully reopened to two traffic lanes in each direction including sidewalks.

Do not close long term 84th Street and the westbound exit and entrance ramp at 84th Street as shown in Stage 1A prior to October 16, 2014, or as approved by the engineer.

Do not close long term 92nd Street until 84th Street is reopened to traffic in each direction.

Do not close long term the eastbound exit ramp to S. 84th Street prior to March 1, 2016, or as approved by the engineer.

Do not close long term W. Kearney Street prior to March 1, 2016, or as approved by the engineer.

Do not close the westbound exit ramp to S. 84th Street and the westbound exit ramp to STH 100 at the same time.

Do not move to Stage 3 in Section 2(East Leg) until the IH 94 westbound exit ramp to S. 84th Street is open to traffic.

Do not close the westbound entrance ramp from 84th Street and the westbound entrance ramp from 70th Street at the same time.

IH 94 WEST may be closed between 70th Street and 84th Street for a onetime only continuous closure of IH 94 WEST within the weekend timeframe of 11:00 PM Friday night to 6:00 AM Sunday morning or 11:00 PM Saturday night to 5:00 AM Monday morning to facilitate the installation of storm sewer pipes P6652 & P6663 and storm sewer structure Z6661. Lane rental assessments will apply to this closure.

Ramp NW may be closed for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of Pier 1 of B-40-855. It is anticipated this closure will take place after IH 94 westbound traffic is shifted to temporary road EWD. Do not overlap the NW ramp seven calendar day closure with the allowed seven calendar day closure of the WN ramp. Lane rental assessments will not apply to this seven calendar day closure, but any additional closures needed to facilitate construction of Pier 1 of B-40-855 will require the use of lane rental credits or lane rental assessments.

Ramp WN may be closed for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of temporary road NEA adjacent to existing USH 45 northbound roadway. Do not overlap the WN seven day closure with the allowed seven day closure of the NW ramp. Lane rental assessments will not apply to this seven calendar day closure.

The eastbound I-94 exit ramp to 84th Street may be closed in Section 2, Stage 2 for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of storm sewer pipes P6354 and P6370A and drainage structures Z6370 and Z6374 located in that ramp. This closure will not be allowed during the State Fair. Lane rental assessments will not apply to this seven calendar day closure.

The westbound Watertown Plank Road entrance ramp to southbound US 45 may be closed in Section 1, Stage 4 for a onetime only period not to exceed 21 consecutive calendar days to facilitate construction of that ramp. Lane rental assessments will not apply to this 21 calendar day closure

The eastbound HWY100 entrance ramp to eastbound IH 94 may be closed in Section 1, Stage 2A for a onetime only period not to exceed 60 consecutive calendar days to facilitate construction of that ramp. Lane rental assessments will not apply to this 60 calendar day closure

Ramp SW steel erection operations over IH 94 west are allowed a onetime only continuous closure of IH 94 west within the weekend timeframe of 11:00 PM Friday night to 6:00 AM Sunday morning or 11:00 PM Saturday night to 5:00 AM Monday morning. Lane rental assessments will apply to this closure.

Ramp SW steel erection operations over IH 94 east and USH 45 south are allowed a onetime only continuous closure of IH 94 east and USH 45 south within the weekend timeframe of 11:00 PM Friday night to 5:00 AM Monday morning. This closure will not be allowed at the same time as the steel erection operations over IH 94 West. Lane rental assessments will apply to this closure.

Open the Southbound US45 exit ramp to Bluemound Road prior to September 4, 2015.

Eastbound IH 94 between 84th and the east end of the project may be reduced to two through lanes to facilitate roadway construction between Station 276EW+75 and Station 285EW+00. This closure will be allowed during Section 2 (East Leg) Stage 5, shall not take place prior to March 15, 2016 and shall not exceed 42 calendar days in duration.

Do not begin or continue any work that closes traffic lanes or ramps outside the allowed time periods specified in this contract. If the contractor fails to open freeway lanes of traffic and/or ramps to traffic by the specified times, assessments shown in the Lane Rental Assessment Table in the article Lane Rental Assessment will be placed upon the contractor based on the hourly rental rate for the closure type and hourly definition that the non-compliant closure occurs. The total assessment to the contractor will be the summation of the separate assessments for each lane and each ramp closure violation.

Permitting the contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the department of any of its rights under the contract.

Work Zone Ingress/Egress.
Provide engineer approved signage and parallel deceleration and acceleration lanes for freeway access into and out of the work zones at locations approved by the engineer.

At the weekly traffic meetings, provide an Emergency Work Zone Access Plan and required updates, as approved by the engineer, to direct emergency responders accessing a mainline median barrier restricted work zone.

Locations of work zone egress or ingress for construction vehicles, other than as shown in the plans, is subject to approval from the engineer. Access into the work zones are not allowed directly from the freeway during peak, weekday midday, and off-peak hours. Access into the work zones from the freeway will be allowed during night-time hours, subject to approval by the engineer, if operations can be safely accomplished and do not result in non-construction traffic entering the work zones. Exiting work zones directly onto the freeway are only allowed when operations do not obstruct or slow traffic on the freeway. All construction vehicles shall yield to all through traffic at all locations.
SEF Rev. 13_0425

Local Street Work Restrictions

Definitions

The following definitions apply to this contract for local street work restrictions:

Peak Hours

- 6:00 AM – 9:00 PM Monday, Tuesday, Wednesday, Thursday, Friday
- 11:00 AM – 8:00 PM Saturday
- 1:00 PM – 5:00 PM Sunday

Off-Peak Hours

- 9:00 PM – 6:00 AM Monday, Tuesday, Wednesday, Thursday
- 9:00 PM – 11:00 AM Friday PM to Saturday AM
- 8:00 PM – 1:00 PM Saturday PM to Sunday PM
- 5:00 PM – 6:00 AM Sunday PM to Monday AM

Bluemound Road

Maintain access to the Milwaukee County Zoo from W. Bluemound Road at N. 99th Street at all times.

Maintain access from the Milwaukee County Zoo to W. Bluemound Road at N. 98th Street at all times.

Maintain access to and from the Zoofari Conference Center at N. 98th Street and W. Bluemound Road at all times. This access shall be separate from the Milwaukee County Zoo exit road.

84th Street

Maintain access to and from the Pettit National Ice Center on S. 84th Street at all times.

Maintain access to the City of Milwaukee Fire Department's Fire station located in the southeast corner of S. 84th Street and W. Honey Creek Parkway at all times.

Adler Street

W. Adler Street may be closed to through traffic and reduced to one lane with one way traffic to facilitate utility, retaining wall and roadway construction. Maintain access to W. Adler Street and all adjacent side streets at all times. Maintain access to and from residences adjacent to the work zone at all times, except during concrete paving operations.

Ryerson Steel has a truck entrance from W. Adler Street to their facility at approximately Station 1022AD+00. Maintain access at this driveway and between this driveway and S. 84th Street at all times.

The City of Milwaukee Adler Water Booster Station is to be relocated under this contract. The contractor should plan for a minimum of four months for procurement of the new station. Complete installation and testing of the Adler Water Booster Station prior to May 30, 2015 in Stage 2 of this contract. The existing water booster station is located on Adler Street at 87th Street. Do not remove the old booster station until the new station, located on Adler Street at 85th Street, has been installed, tested, and approved by the City of Milwaukee. After removing the old water booster station, abandon the existing 16-inch water main in Adler Street as shown in the water main plans.

Construct wall R-40-546 from the Interstate side of the wall to reduce construction impacts to Adler Street. This includes all drilling operations, materials delivery and removal, and all materials and equipment staging and storage.

Chester Street

W. Chester Street west of 92nd Street may be closed to through traffic. Maintain access to and from residences adjacent to the work zone at all times, except during concrete paving operations.

W. Chester Street east of 92nd Street may be closed to through traffic. Maintain access to and from the multi-family residences on the cul-de-sac at all times, except during concrete paving operations.

Honey Creek Corporate Center Building #4 is located on W. Chester Street east of 92nd Street. Access to this facility is only available from 92nd Street and from 84th Street via the Honey Creek Corporate Center. Access shall be maintained from 92nd Street until work east of the driveway is complete. Then access shall be maintained from 84th Street until work west of the driveway is complete. Either the 92nd Street or 84th Street access point shall be available at all times.

Construct wall R-40-548 from the Interstate side of the wall to reduce construction impacts to Chester Street. This includes all drilling operations, materials delivery and removal, and all materials and equipment staging and storage.

General

Provide Milwaukee County Transit System - Coordinator of Street Supervision, Dave Ziarek, (414) 343-1764, with a schedule of W. Bluemound Road, S. 92nd Street, S. 84th Street and W. Wisconsin Avenue closures 14 calendar days prior to closure. Also coordinate the location of each Temporary Bus Stop Pad with Dave Ziarek 14 calendar days prior to installation.

Comply with all local ordinances that apply to local street work operations, including those pertaining to working during night time hours. Furnish any ordinance variance issued by the municipality or required permits to the engineer in writing 3 business days prior to performing such work.

Keep sidewalks open unless otherwise shown on the plans, or to facilitate the removal of structures and erection of girders or as approved by the engineer. Maintain pedestrian access to adjacent properties, businesses, schools, and at bus stops or provide where necessary, as directed by the engineer. Protect pedestrians from falling debris at all times when sidewalks are open.

Provide adequate temporary sidewalk and bridging between the curb and right-of-way line over freshly paved concrete or other obstructions in the sidewalk area, as directed by the engineer.

Construct temporary sidewalk surfaces with a minimum of 2 inches of temporary asphaltic surface, any grade of concrete, skid resistant steel plating, or alternative material as approved by the engineer and a minimum of 4-feet wide. Compact the surface of temporary asphaltic surface until smooth and capable of supporting a wheelchair. The separate payment for the construction of temporary sidewalks including materials, labor, removal and restoration, will be made by the department under the bid item Temporary Crosswalk/Sidewalk, unless otherwise shown on the plans.

Inform property owners and tenants at least 48 hours prior to removing a driveway approach that serves that property. Schedule sidewalk and driveway approach removal and replacement so that the time lapse between removal and replacement is minimal.

Do not close residential approaches or remove from service without giving sufficient notice to the occupants of the premises to remove their vehicles prior to driveway removal or closing of the driveway approach access. If necessary, make other access arrangements, agreed to in writing and signed by the contractor and the property owner serviced by the driveway. Obtain approval from the engineer prior to alternating construction sequencing.

Existing trees, street light poles, hydrants and other utility poles are to remain in place during construction unless otherwise noted in the plan. Conduct an on-site visit prior to bidding to determine any special measures required for proper clearance between the trees, hydrants and poles and the paving equipment. No additional compensation will be made.

All Work Restrictions

When engaged in roadway cleaning operations, use equipment having vacuum or water spray mechanisms to eliminate the dispersion of particulate matter into the atmosphere. If vacuum equipment is employed, it must have suitable self-contained particulate collectors to prevent discharge from the collection bin into the atmosphere.

Excavation material and cleared and grubbed material should be stockpiled on upland areas an adequate distance away from wetlands, storm sewer inlets, floodplains, and the waterways as determined by engineer.

Provide the Wisconsin State Patrol, Milwaukee County Highway Maintenance, the City of Milwaukee Police Department, the City of Wauwatosa Police Department, the City of West Allis Police Department, and Milwaukee County Sheriff's Department with a 24-hour emergency contact number for when maintenance is required.

Interim and Final Completion of Work
Supplement standard spec 108.11 by adding the following to the end of the subsection:

The department will not grant time extensions for the following:

- Severe weather as specified in standard spec 108.10.2.2.
- Labor disputes that are not industry wide.
- Delays in material deliveries.

Each day is defined as a twenty-four hour period beginning at 12:01 AM.

For the purpose of completion dates,

Section 1 is defined as all areas not included in Section 2.

Section 2 (East Leg) is defined as all freeway and local road work areas adjacent to I-94, crossing I-94, and including the I-94 freeway east of station 195EW

Interim Completion of Work 5/22/2015
Supplement standard spec 108.11 as follows.

If the contractor fails to complete all of the work necessary to open Bluemound Road to all traffic lanes in each direction including:

- Bluemound Road pavement marking, sidewalks, signage and lighting;
- The 95th Street traffic signal and all associated detection, signage, pedestrian heads, conduit, and lighting;
- The Bluemound/95th Street intersection including all approaches, pavement marking, sidewalks, lighting, and signage;
- 95th Street between Bluemound and Wisconsin Avenue including pavement marking, sidewalks, lighting, and signage;
- Wisconsin Avenue work at and east of 95th Street including pavement marking sidewalks, lighting and signage.

prior to 12:01 AM on May 23, 2015, the department will assess the contractor $75,000 in interim liquidated damages per day for each calendar day after 12:01 AM on May 23, 2015. An entire calendar day will be charged for any period of time within a calendar day that the road remains closed beyond 12:01 AM on May 23, 2015.

See article Incentive/Disincentive for Interim Completion of Work for additional information.

Interim Completion of Work 9/3/2015
Supplement standard spec 108.11 as follows.

If the contractor fails to complete all of the work necessary to open the Southbound US45 exit ramp to Bluemound Road prior to 12:01 AM on September 4, 2015, the department will assess the contractor $5,000 in interim liquidated damages per day for each calendar day after 12:01 AM on September 4, 2015, the exit ramp is not open. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM on September 4, 2015.

Interim Completion of Work N-W Ramp
Supplement standard spec 108.11 as follows

If the contractor fails to complete all work and coordination measures necessary on the ramp from SB US45 to WB I-94, the N-W Ramp, to restore traffic on the ramp within seven calendar days of the closure date, the department will assess the contractor $30,000 in interim liquidated damages for each calendar day that the ramp remains closed after 12:01 AM, on the eighth calendar day after the closure begins. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM, on the eighth day, the N-W Ramp is not open.

Interim Completion of Work W-N Ramp
Supplement standard spec 108.11 as follows

If the contractor fails to complete all work and coordination measures necessary on the system ramp from EB I-94 to NB US 45, the W-N Ramp to restore traffic on the ramp within seven calendar days of the closure date, the department will assess the contractor $25,000 in interim liquidated damages for each calendar day that the ramp remains closed after 12:01 AM, on the eighth calendar day after the closure begins. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM, on the eighth day, the W-N Ramp is not open..

Interim Completion of Work 84th Street Ramp
Supplement standard spec 108.11 as follows

If the contractor fails to complete all storm sewer work as shown in Section 2, Stage 2 and coordination measures necessary on the EB I-94 exit ramp to 84th Street to restore traffic on the ramp within seven calendar days of the closure date, the department will assess the contractor $10,000 in interim liquidated damages for each calendar day that the ramp remains closed after 12:01 AM, on the eighth calendar day after the closure begins. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM, on the eighth day, the exit ramp is not open.

Interim Completion of Work Watertown Plank Road Ramp
Supplement standard spec108.11 as follows

If the contractor fails to complete all concrete paving as shown in Section 1, Stage 4 and coordination measures necessary on the westbound Watertown Plank Road entrance ramp to southbound US 45 to restore traffic on the ramp within 21 calendar days of the closure date, the department will assess the contractor $10,000 in interim liquidated damages for each calendar day that the ramp remains closed after 12:01 AM, on the 22nd calendar day after the closure begins. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM, on the 22nd day, the entrance ramp is not open.

Interim Completion of Work HWY 100 Ramp
Supplement subsection 108.11 of the standard specifications as follows

If the contractor fails to complete all concrete paving as shown in Section 1, Stage 2A and coordination measures necessary on the eastbound HWY100 entrance ramp to eastbound IH 94 to restore traffic on the ramp within 60 calendar days of the closure date, the department will assess the contractor $10,000 in interim liquidated damages for each calendar day that the ramp remains closed after 12:01 AM, on the 61st calendar day after the closure begins. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM, on the 61st day, the entrance ramp is not open.

Interim Completion of Work 11/24/2015
Supplement standard spec 108.11 as follows.

If the contractor fails to complete all of the work necessary to open Structure B-40-855 and the pavement for the service ramp S-W that carries traffic from northbound I-894 to WB I-94 prior to 12:01 AM on November 25, 2015, the department will assess the contractor $70,000 in interim liquidated damages per day for each calendar day after 12:01 AM on November 25, 2015, that the S-W Ramp is not open to vehicular traffic. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM, on November 25, 2015.

Interim Completion of Work 12/21/2015
Supplement standard spec 108.11 as follows:

If contract time expires prior to completing all **Section 1** contract work and all work to get **Section 2(East Leg)** into Stage 3B (Winter Shutdown), by 12:01 AM on December 22, 2015, the department will assess the contractor $50,000 in interim liquidated damages per calendar day for each calendar day after 12:01 AM on December 22, 2015, that **Section 1** is not completed and **Section 2 (East Leg)** is not into Stage 3B (Winter Shutdown). An entire calendar day will be charged for any period of time within a calendar day that Section 1 is not completed and Section 2 (East Leg) is not into Stage 3B(Winter Shutdown) beyond 12:01 AM, on December 22, 2015.

Interim Completion of Work EB I-94
Supplement standard spec 108.11 as follows

If the contractor fails to complete all work and coordination measures necessary on EB I-94 to restore traffic to 3 lanes within 42 calendar days of the closure date, the department will assess the contractor $50,000 in interim liquidated damages for each calendar day that the ramp remains closed after 12:01 AM, on the 43rd calendar day after the closure begins. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM, on the 43rd day, the roadway is not open to three lanes.

Final Completion of Work 06/26/2016
Supplement standard spec 108.11 as follows:

If contract time expires prior to completing all contract work, by 12:01 AM on June 27, 2016, the department will assess the contractor $50,000 in liquidated damages per calendar day for each calendar day after 12:01 AM on June 27, 2016, that the project is not completed. An entire calendar day will be charged for any period of time within a calendar day that the project remains uncompleted beyond 12:01 AM, on June 27, 2016.

Winter Maintenance
Milwaukee County will perform snow removal operations for freeway and ramp lanes that are open to traffic. The Cities of Milwaukee, Wauwatosa, and West Allis will perform snow removal operations for local streets that are open to traffic. Provide for snow removal in those areas closed to traffic as required to facilitate safe construction operations and as required to eliminate snow melt run-off from crossing active roadways. Provide Milwaukee County Highway Maintenance and Milwaukee County Sheriff's Department with a 24-hour emergency contact number for when maintenance is required.
SEF Rev. 12_0330

Migratory Birds
Swallow and other migratory birds' nests have been observed on or under the existing bridge. All active nests (when eggs or young are present) of migratory birds are protected under the federal Migratory Bird Treaty Act.

The nesting season for swallows and other birds is usually between May 1 and August 30. Either prevent active nests from becoming established, or apply for a depredation permit from the US Fish and Wildlife Service for work that may disturb or destroy active nests. The need for a permit may be avoided by removing the existing bridge structure prior to nest occupation by birds, or clearing nests from all structures before the nests become active in early spring. As a last resort, prevent birds from nesting by installing a suitable netting device on the remaining structure prior to nesting activity. Include the cost for preventing nesting in the cost of Removing Old Structure.

5. Lane Rental Assessment.

A General

This contract includes a lane rental charge procedure under which a rental charge is assessed for each freeway shoulder closure, each freeway lane closure, each service ramp closure, each system ramp closure, and each full closure of a directional freeway roadway from the time of notice to proceed until the project is complete. If a lane is obstructed at any time due to operations, it is considered a closure. The purpose of lane rental is to discourage unnecessary short term closures, especially during time periods outside night time hours.

A.1 Lane Rental Assessment Table

The hourly rental rate will be assessed for each shoulder closure, each freeway lane closure, each service ramp closure, each system ramp closure, and each full closure of a freeway roadway as follows:

Lane Rental Assessment Table										
Freeway Closure Type	Peak Hours		Weekday Midday and Weekend Peak Hours		Weekday Off-Peak		Weekend Off-Peak Hours		Night Time Hours	
	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits
Shoulder when at least 8 feet, shoulder is reduced to less than 8 feet	$2,500	0	$1,900	0	$950	1280	$400	480	$50	1324
Single Lane when 2 or more lanes next to closure are open to traffic	$35,000	0	$30,000	0	$7,200	1280	$1,800	960	$200	7970
Single Lane when only 1 lane next to closure is open to traffic	$63,500	0	$50,000	0	$20,000	0	$9,200	0	$900	2650
2 lanes when 2 lanes next to closure are open to traffic	$40,000	0	$25,000	0	$13,400	0	$6,900	0	$700	1600
2 lanes when 1 lane next to closure is open to traffic	$63,500	0	$50,000	0	$20,000	0	$9,200	0	$900	3700

Lane Rental Assessment Table										
Freeway Closure Type	Peak Hours		Weekday Midday and Weekend Peak Hours		Weekday Off-Peak		Weekend Off-Peak Hours		Night Time Hours	
	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits	Hourly Rental	Closure Hour Credits
Service Ramp	$2,000	43	$1,700	43	$1,500	14	$1,000	11	$700	6700
System Ramp	$42,500	85	$20,000	86	$10,000	28	$4,700	21	$700	4500
Full Roadway Closure (One Direction of the Freeway)	$120,000	0	$80,000	54	$40,000	0	$25,000	33	$1650	2156

The monetary amount represents the average hourly cost of the interference and inconvenience to the road user for each closure and the cost to the department for closure implementation. Lane rental in excess of the maximum credited hours specified will be assessed. The assessment will be the total number of hours that each shoulder, lane, roadway, or ramp closure exceeds the "closure hour credits", multiplied by the "hourly rental" rate as defined in the Lane Rental Assessment Table.

The rental assessment will be 15-minute increments for closure time periods equal to or less than 60 minutes in length. All shoulder, lane, roadway, or ramp closure event durations will be rounded up or down to the nearest quarter hour for the purposes of this computation. Assessments will be administered via deductions made from the monies due to the contractor based on the hourly rental rate for the closure type and hourly definition that the non-compliant closure occurs. The deduction will be made based on the applicable rate for any and all closures whether work is being performed or not. The engineer, or designated representative, will be the sole authority in determining time period length for the lane rental charge.

Lane rentals will not be assessed for upstream service interchange ramp closures used to reduce vehicle demand heading into downstream roadway or ramp closures.

Lane rental will not be assessed for mainline closures noted in the plans under the title "Traffic Control/Construction Stage XX". Additional lane or ramp closures shown beyond those in the plans under the title "Traffic Control/Construction Stage XX" will be assessed if the closures exceed the credited hours.

Lane rental will not be assessed for ramp closures noted in the plans under the title "Traffic Control/Construction Stage XX" if the plans and construction operations already include such closures. Additional ramp closures shown beyond those in the plans under the

title "Traffic Control/Construction Stage XX" will be assessed if the closures exceed the credited hours.

Lane rental for shoulder shall only apply to shoulders along the traveled way of the freeway. A shoulder is considered closed when a paved shoulder area with 8 feet or more of width is reduced to a dimension less than 8-feet wide by contractor's equipment or traffic control devices, excluding spot locations of advance traffic control devices "in use" for other lane or ramp closures. Lane rental for shoulder shall not apply to shoulders along ramps or along closed traffic lane(s).

Lane rental will not be assessed for maintenance of temporary surfaces, if in the opinion of the engineer, maintenance of the damaged pavement was completed expeditiously, and the lack of maintenance would cause safety concerns to the traveling public.

Lane rental will not be assessed for closures due to crashes, accidents or emergencies.

A1.1 Lane Rental Assessment and Liquidated Damages
On those days when charged with the liquidated damage fee; and a shoulder, ramp or lane closure is in effect to facilitate construction operations that are exceeding credited hours; both the lane rental assessment and the liquidated damages fee will be charged.

B (Vacant)

C (Vacant)

D Measurement
The department will assess Lane Rental Assessment by the dollar under the administrative item Failing to Open Road to Traffic. The charge will be the total dollar amount of each freeway closure type category where the total number of hours that each shoulder, lane, ramp, or roadway closure exceeds the project maximum number of "closure hour credits," as defined in the Lane Rental Assessment Table, multiplied by the "hourly rental" as defined in the Lane Rental Assessment Table. The Lane Rental Assessment total will not be reduced or offset with freeway closure type categories where the total closure hours were less than "closure hour credits." Lane Rental Assessment will be in effect from the time of notice to proceed until such time that the project is complete.

E (Vacant)

6. Traffic.

General
Keep IH 894, IH 94, USH 45, all system ramps and all service ramps open to through traffic at all times for the duration of this project except as noted below and in the Prosecution and Progress article in these special provisions.

Residential and Business Property Access
Maintain access to properties along W. Bluemound Road, N. 97th Street, N. 95th Street, W. Adler Street (and all adjacent side streets), W. Chester Street, S. 92nd Street, S. 84th Street, W. O'Connor Street, W. Kearney Street and S. 100th Street for local residents, businesses, and emergency vehicles. Maintain and keep open the access to all driveways and parking lots where alternative access is not available at all times by closing one driveway at a time, building half the driveway at a time and/or plating concrete work. Plating of concrete work, as directed by the engineer, is included in the item that is being plated. In parking lots that are being reconstructed, stage operations so that parking and access is maintained on existing or proposed base aggregate or pavement.

Pedestrian Access
Maintain sidewalk at all times except under direction of the engineer. Provide a temporary surface for pedestrian access at all times in areas of sidewalk construction. Construct the temporary surface to meet Americans with Disabilities Act Accessibility Guidelines (ADAAG) requirements consisting of temporary asphaltic surface, any grade of concrete, skid resistant steel plating, or alternative material as approved by the engineer. Gravel or base course material is not acceptable. Maintain sidewalk access to all businesses and residences at all times. The Temporary Crosswalk/Sidewalk bid item is payment for maintaining crosswalks and sidewalks through the construction zone at signalized intersections.

Maintain pedestrian movements crossing the construction zone at all intersections at all times, unless otherwise directed by the engineer. Construct pedestrian crossings of intersections to meet the requirements of the ADAAG consisting of temporary asphaltic surface, any grade of concrete, skid resistant steel plating, or alternative material as approved by the engineer. Gravel or base course material is not acceptable. At all times, ADAAG accessible pedestrian walkways shall be maintained free from mud, sand, and construction debris. The Temporary Crosswalk/Sidewalk bid item is payment for maintaining crosswalks through the construction zone where existing crosswalks exist. Closures of sidewalk must be approved by the engineer and conform to signing shown on the traffic control plan. At locations where crosswalks crossing W. Bluemound Road, S. 92nd Street, S. 84th Street, W. O'Connor Street and W. Kearney Street exist on both sides of the intersection, closure of one of the two crosswalks is permitted as long as all other crossings are completely open. At intersections where only one crosswalk exists crossing W. Bluemound Road, S. 92nd Street, S. 84th Street, W. O'Connor Street and W. Kearney Street, stage work to maintain the crosswalk at all times.

Schedule of Operations
Traffic shifts shown in a given stage may occur at different times during that stage depending on the controlling elements for a given traffic movement as approved by the engineer. The department anticipates that the schedule for each stage shall be as follows:

Section 1 is defined as all areas not included in Section 2.

Section 2 (East Leg) is defined as all freeway and local road work areas adjacent to I-94, crossing I-94, and including the I-94 freeway east of Station 195EW

Stage 1A Traffic, Section 1and Section 2(East Leg):

- Shift USH 45 northbound traffic at Bluemound Road to median
- Close northbound exits to Bluemound Road and Wisconsin Avenue
- Shift IH 94 eastbound traffic at 76th Street to median
- Close IH 94 westboud entrance ramp from 84th Street
- Close IH 94 westbound exit ramp to 84th Street
- Close Bluemound Road
- Close 84th Street
- Close O'Connor Street between 84th and Honey Creek Drive
- Reduce Adler to 1 lane between 94th Place and 90th Street

Stage 1B Traffic, Section 1and Section 2(East Leg):

- Shift USH 45 northbound traffic at Bluemound Road to road NSC
- Shift USH 45 southbound traffic at Bluemound Road to outside
- Close southbound entrance ramp from Wisconsin Avenue to USH 45 southbound
- Shift IH 94 eastbound traffic at 76th Street to outside widening
- Close median lane of IH 94 westbound at 68th Street
- Shift IH 94 westbound traffic at 76th Street to outside
- Open 84th Street to one lane in each direction

Stage 1C Traffic, Section 1and Section 2(East Leg):

- Shift USH 45 southbound traffic at Bluemound Road to median

Stage 2A Traffic, Section 1and Section 2(East Leg):

- Shift IH 894/USH 45 northbound traffic to road NSA
- Close Ramp SW
- Shift IH 94 eastbound traffic at STH 100 to median
- Shift IH 94 westbound and Ramp NW traffic to outside at Ramp NW gore
- IH 94 westbound remains at two lanes between 84th and 68th Streets
- Shift IH 94 westbound traffic at 76th Street to median
- Close Ramp ES
- Close entrance ramp from STH 100 to IH 94 eastbound
- Close 92nd Street
- Close Schlinger Avenue at IH 894/USH 45
- Reduce Adler Street to 1 lane from 94th Place to 84th Street

Stage 2B Traffic, Section 1and Section 2(East Leg):

- Shift IH 94 eastbound traffic at STH 100 to new roadway
- Shift IH 94 westbound and Ramp NW traffic to temporary roadway at Ramp NW gore
- IH 94 westbound remains at two lanes between 84th and 68th Streets

- Open entrance ramp from STH 100 to IH 94 eastbound
- Open IH 94 westbound entrance ramp from 84th Street
- Close IH 94 westbound entrance ramp from 70th Street

Stage 3A Traffic, Section 1and Section 2(East Leg):

- Shift USH 45 southbound traffic at Watertown Plank Road to median
- Open Bluemound Road
- Open 95th Street
- Close Wisconsin Avenue
- Shift IH 94 eastbound traffic to road EWB
- Shift IH 94 westbound traffic to existing eastbound road at STH 100
- Shift IH 94 westbound traffic to road EWD
- Close IH 94 westbound exit ramp to STH 100
- Shift IH 94 eastbound traffic to new outside roadway between 96th and 86th Streets
- IH 94 westbound remains at two lanes between 84th and 68th Streets
- Shift IH 94 westbound traffic to new outside roadway between 96th and 70th Streets
- Open IH 94 westbound exit ramp to 84th Street
- Open westbound entrance ramp from 70th Street to IH 94 westbound
- Open O'Connor Street
- Open 84th Street to two lanes in each direction

Stage 4A/4B Traffic, Section 1:

- Shift USH 45 southbound traffic to new southbound roadway
- Shift USH 45 southbound traffic at Watertown Plank Road to outside
- Close southbound entrance ramp from Watertown Plank Road westbound to USH 45 southbound for 21 calendar days.
- Shift Ramp NE to existing northbound roadway at Wisconsin Avenue
- Shift Ramp NE to road NEA
- Open new Ramp NW
- Open new USH 45 southbound exit ramp to Bluemound Road
- Open westbound exit ramp to STH 100 (from Ramp NW only)

Stage 5A Traffic, Section 1:

- Shift IH 894/USH 45 southbound traffic to new northbound roadway at IH 94, open southbound entrance ramp from Watertown Plank Road westbound to USH 45 southbound
- Open Ramp SW
- Open 92nd Street
- Open Schlinger Avenue
- Shift Ramp WS to road WSA

Stage 5B Traffic, Section 1(Final Configuration):

- Closure of Wisconsin Avenue remains in place
- Closure of northbound Bluemound Ramps remain in place
- Closure of Ramp ES remains in place

Stage 3B Traffic, Section 2(East Leg):

- Winter shut down

Stage 4A/4B Traffic, Section 2(East Leg):

- Shift IH 94 eastbound traffic to new eastbound and westbound roadway between 96th and 70th Streets
- IH 94 eastbound traffic reduced to two lanes between 84th and 68th Streets at end of Stage 4
- IH 94 westbound remains at two lanes between 84th and 68th Streets
- Close IH 94 eastbound exit ramp to 84th Street
- Close eastbound entrance ramp from 84th Street to IH 94
- Close IH 94 eastbound exit ramp to 70th Street
- Close Kearney Avenue at 84th Street
- Close Kearney Avenue between 73rd and 70th Streets
- Reduce 84th Street to one lane in each direction

Stage 5A Traffic, Section 2(East Leg):

- Shift IH 94 eastbound traffic to new eastbound roadway
- IH 94 eastbound traffic remains reduced to two lanes between 84th and 68th Streets
- Open IH 94 eastbound exit ramp to 84th Street
- Open Kearney Street

Stage 5B Traffic, Section 2(East Leg) (Final Configuration):

- Open entrance ramp from 84th Street to IH 94 eastbound
- Open IH 94 eastbound exit ramp to 70th Street

7. Holiday and Special Event Work Restrictions.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying USH 45, IH 94, IH 894 traffic, and entirely clear the traveled way and shoulders of such portions of the highway of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic during the following holiday periods:

- From noon Wednesday, November 26, 2014 to 6:00 AM Monday, December 1, 2014 for Thanksgiving.
- From noon Tuesday, December 23, 2014 to 6:00 AM Friday, December 26, 2014 for Christmas
- From noon Tuesday, December 30, 2014 to 6:00 AM Friday, January 2, 2015 for New Year's Day;
- From noon Friday, May 22, 2015 to 6:00 AM Tuesday, May 26, 2015 for Memorial Day;
- From noon Friday, July 3, 2015 to 6:00 AM Monday, July 6, 2015 for Independence Day;
- From noon Friday, September 4, 2015 to 6:00 AM Tuesday, September 8, 2015 for Labor Day;
- From noon Wednesday, November 25, 2015 to 6:00 AM Monday, November 30, 2015 for Thanksgiving;
- From noon Wednesday, December 23, 2015 to 6:00 AM Saturday, December 26, 2015 for Christmas;
- From noon Wednesday, December 30, 2015 to 6:00 AM Saturday, January 2, 2016 for New Year's Day;
- From noon Friday, May 27, 2016 to 6:00 AM Tuesday, May 31, 2016 for Memorial Day.

Provide any proposals to work within the work zone(s) adjacent to the highway carrying USH 45, IH 94, IH 894 traffic during the established holiday periods to the engineer for approval. Proposals will include a plan that establishes work type, hours of operations, and will certify no ingress/egress to the site by construction or worker vehicles from USH 45, IH 94, IH 894 consistent with the above restrictions for equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic as noted above.

Holiday work restrictions do not apply to roadways or ramps already closed long term during construction as shown on the plans. New long term closures of ramps and roadways must be coordinated with the holiday work restrictions.

Special event work restrictions do not apply to roadways or ramps already closed long term during construction as shown on the plans. New long term closures of ramps and roadways must be coordinated with the special event work restrictions.

Freeway Restrictions

During Summer Fest, keep open the following roadways until one hour after the event closes each night:

- System ramps (those that are not already closed long-term per the staging plans).
- Service interchange ramps at the Watertown Plank, 84th Street, and 68th/70th Street service interchanges (those that are not already closed long-term per the staging plans).
- Maintain two open lanes on IH 94 WEST , one open lane on IH 94 EAST, and one open lane on USH 45, north of I-94, in both directions.

During Wisconsin State Fair, keep open the following roadways until one hour after the event closes each night:

- System ramps (those that are not already closed long-term per the staging plans).
- Service interchange ramps (those that are not already closed long-term per the staging plans).
- Maintain two open lanes on IH 94 and USH 45 in both directions.

On days with a Milwaukee Brewer home game at Miller Park, maintain two outbound lanes on westbound IH 94 from Miller Park up until four hours after the start of the game. IH94 restrictions during other special events at Miller Park will be determined on an as needed basis.

Local Road Restrictions
Work will be restricted on these local roads during these special events.

- On Bluemound Road, no work allowed on weekend days during the Milwaukee County Zoo's A la Carte event (one weekend/year).

- On Bluemound Road, no work allowed on Family Free Days at the Milwaukee County Zoo (4 Saturdays/year).

- On 84th Street and Kearney, no work allowed on days with the Wisconsin State Fair festival at State Fair Park (11 days in July/August).

These restrictions also apply to hauling of materials.

8. Utilities.

This contract comes under the provisions of Administrative Rule TRANS 220.

Additional information regarding recently relocated utility facilities may be available on permits issued to the utility companies. These permits can be viewed at the Region Office during normal working hours. Contact WisDOT SE Freeways Utility Coordinator Maria Rojas at (414) 750-4362 for further information.

Underground and overhead utility facilities are located within the project limits. Utility adjustments are required for this construction project as noted below. Coordinate construction activities with a call to Diggers Hotline or a direct call to the utilities that have facilities in the area as required per state statute. Use caution to ensure the integrity of underground facilities and maintain code clearances from overhead facilities at all times.

Some utility work, as described below, is dependent on prior work being performed by the contractor at a specific site. Provide the engineer and the affected utility a good faith notice of when the utility is to start work at the site. Notice shall be given 14 to 16 calendar days in advance of when the site will be available to the utility. Follow up with a confirmation notice to the engineer and the utility not less than 3 working days before the site will be ready for the utility to begin its work.

Contact utility companies listed in the plans prior to preparing bids to obtain current information on existing utility locations and the status of any new utility relocation work.

Utility companies will be performing utility work and adjustments within the limits and during the life of the project. The contractor shall cooperate and coordinate construction activities with these companies.

There may be abandoned utility facilities within the project limits. If a conflict with an abandoned utility facility is encountered, contact the appropriate utility owner/representative to coordinate construction activities and proper removal and disposal of said facility as necessary.

Utility working days shown herein are as defined in Wisconsin Administrative Code Chapter Trans 220.

Known utilities in the projects are as follows:

AT&T Corporation has existing underground communications facilities within the project limits in the following locations:

- An underground communications package beginning from beyond the easterly project limits running westerly along the north fence line of IH 94 to a handhole at Station 786TMD+95, 20'RT, where it turns and runs northerly along the east side of 70th Street to a handhole 200' north of O'Connor Street. From there it turns and runs westerly in the ATC/We Energies transmission corridor to the 96th Street Substation located in the northeast quadrant of the Zoo Interchange. From this point the line runs southwesterly along the east property line of the 96th Street Substation, crossing IH 94 at Station 198EW+05, and continues southwesterly to the Hank Aaron State Trail. From there it turns and runs westerly in the Hank Aaron State Trail to Station 130EW+35, 108'RT where it turns and runs westerly along the south right-of-way of IH 94 to Station 121EW+70, 96'RT. From there it turns and runs southwesterly along the south right-of-way of IH 94 to Station 95EW+71, 140'RT where it turns and runs northerly, crossing IH 94 at Station

95EW+71, to Station 95EW+71, 148' LT. From there it turns and runs westerly along the north right-of-way of IH 94 to beyond the westerly project limits. This line will remain in place without adjustment.

- An underground communications package beginning at a handhole at Station 299EW+01, 81'RT running southerly in S. 66th Street to the Hank Aaron State Trail where it turns and runs westerly in the Hank Aaron State Trail to Station 184HA+13, 33' LT. From there it turns and runs southwesterly to a handhole at Station 783GE+70, 24' LT where it turns and runs southerly along the east fence line of USH 45/IH 894 to beyond the southerly project limits. AT&T Corporation will abandon this line in place from Station 784GE+65, 149'RT to Station 767GA+21, 13' LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground communications package beginning at the 96th Street Substation in the northeast quadrant of the Zoo Interchange at Station 803FH+32, 297' LT running southwesterly to Station 802FH+00, 63' LT where it turns and runs northwesterly to Station 525EN+69, 157'RT. From there it turns and runs westerly, crossing USH 45 at Station 299NS+93, to Station 490NW+07, 62'RT where it turns and runs southwesterly to Station 485NW+32, 41'RT. AT&T Corporation no longer occupies this facility however WisDOT FTMS has facilities occupying this conduit package. WisDOT FTMS will remove these facilities prior to December 31, 2014.

AT&T Corporation will construct a new underground communications package prior to construction beginning at Station 784GE+65, 149'RT running southerly along the east right of way of USH 45/IH 894, crossing Schlinger Avenue near Station 531SCH+64, and continues southerly to Station 768GE+00, 56'RT. From there it turns and runs southwesterly to Station 784GE+65, 75'LT.

AT&T Corporation also has an abandoned conduit package within the project limits in the following locations:

- An underground communications package beginning at a handhole at Station 786TMD+95, 20'RT and running westerly along the south side of the northerly fence of IH 94, crossing S. 84th Street at Station 42F+14 and crossing S. 92nd Street at Station 66TJ+35, and continues westerly to Station 802FH+00, 63' LT.
- An underground communications package beginning at Station 485NW+32, 41'RT running westerly along the north fence of IH 94 to Station 558SA+91, 19' LT where it turns and runs northwesterly to Station 577SS+85, 101'RT. From there it turns and runs westerly, crossing HWY 100 at Station 577SS+85, and continues westerly along the north fence of IH 94 to Station 95EW+70, 148' LT.
- An underground communications package beginning from beyond the easterly project limits running westerly along the north side of the south fence of IH 94, crossing S. 84th Street at Station 38F+96 and S. 92nd Street at Station 63TJ+77, to Station 800FC+00, 0' LT where it turns and runs southwesterly along the easterly right-of-way of USH 45/IH 894 to Station 783GE+70, 24' LT.

- An underground communications package beginning at a handhole at Station 530SCH+34, 24’ LT and running westerly along the north side of Schlinger Avenue to beyond the westerly project limits.

Contact Ken Nine, (574) 904-6336 cell, of JMC Engineers & Associates, Inc. 7 days in advance to coordinate locations and any excavation near their facilities.

AT&T Wisconsin has underground and overhead communication facilities within the project limits in the following locations:

- An overhead communications line beginning from beyond the southerly project limits of the UPRR Berm running northerly on We Energies poles along the west side of IH 894 / USH 45 to a pole at Station 228NS+64, 198’LT. AT&T Wisconsin will relocate to new We Energies poles along the west right of way of IH 894 / USH 45 prior to construction.
- An overhead communications line beginning from beyond the southerly project limits running northerly on We Energies poles along the east right-of-way of IH 894 / USH 45 to a pole at Station 278NS+85, 275’RT. This line will remain in place without adjustment.
- An overhead communications line beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running northerly on We Energies poles along the east right-of-way of USH 45 to a pole at Station 318NS+15, 109’RT where it turns and runs easterly to beyond the easterly project limits. AT&T Wisconsin will relocate this line prior to construction.
- An underground communications line beginning from beyond the westerly project limits of Bluemound Road running easterly, crossing USH 45 on the Bluemound Road Structure at Station 323NS+06, to beyond the easterly project limits of Bluemound Road. The conduit from a manhole at Station 194BL+79, 17’LT to Station 202BL+86, 20’LT is composed of transite material and it will be removed by AT&T Wisconsin in conjunction with the demolition of the Bluemound Road structure and pavement removal. Allow AT&T Wisconsin 2 working days to perform removal of the transite conduits on the structure and 3 working days once the pavement has been removed in the areas east and west of the existing structure. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 21 days prior to the demolition of the structure to coordinate removal. AT&T Wisconsin will also lower and adjust this line from Station 191BL+20, 16’ LT to a manhole at Station 192BL+05, 17’ LT prior to construction. AT&T Wisconsin will also adjust this line at Station 192BL+62, 17’ LT during construction. Contact Jay Bulanek, (414) 535-7407, of AT&T Wisconsin 7 days prior to the pavement removal in this location and allow AT&T Wisconsin 1 day to complete the adjustment. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning from beyond the westerly project limits of Wisconsin Avenue running easterly, crossing USH 45 on the Wisconsin Avenue Structure at Station 334NS+66, to beyond the easterly project limits of Wisconsin Avenue. The conduit from a manhole at Station 25WX+26, 34’LT to Station 32WX+56, 34’LT is composed of transite material and it will be removed

by AT&T Wisconsin in conjunction with the demolition of the Wisconsin Avenue structure and removal of pavement. Allow AT&T Wisconsin 2 working days to perform removal of the transite conduits on the structure and 3 working days once the pavement has been removed in the areas east and west of the existing structure. Contact Jay Bulanek, (414) 535-7407, of AT&T Wisconsin 21 days prior to the demolition of the structure to coordinate removal. AT&T Wisconsin will also adjust this line at Station 24WX+34, 34' LT and at Station 33WX+00, 30' LT during construction. Contact Jay Bulanek, (414) 535-7407, of AT&T Wisconsin 7 days prior to the pavement removal in this location and allow AT&T Wisconsin 1 day to complete the adjustment. The remaining portions of this line will remain in place without adjustment.

- An underground communications line beginning from beyond the westerly project limits of Wisconsin Avenue running easterly along the north right of way of Wisconsin Avenue to Station 24WX+77, 91' LT where it turns and runs northerly along the west right of way of USH 45 to Station 743WC+50, 27' RT where it turns and runs northwesterly to beyond the westerly project limits. AT&T Wisconsin will relocate this line from Station 340NS+86, 150' LT to beyond the westerly project limits prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 153EW+57, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground communications line beginning from beyond the westerly Adler Street limits running easterly along the south side of Adler Street to Station 995AD+01, 32'RT where it turns and runs southerly to beyond the southerly project limits of S. 92nd Street. This line will remain in place without adjustment.
- An underground communications line beginning from beyond the southerly project limits of S. 92nd Street running northerly, crossing IH 94 at Station 210EW+18, to a manhole at Station 66TJ+61, 32'LT. The conduit from a manhole at Station 63TJ+61, 32'LT to Station 66TJ+61, 32'LT is composed of transite material and it will be removed by AT&T Wisconsin in conjunction with the demolition of the 92nd Street structure and removal of pavement. Allow AT&T Wisconsin 2 working days to perform removal of the transite conduits on the structure and 3 working days once the pavement has been removed in the areas north and south of the existing structure. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 21 days prior to the demolition of the structure to coordinate removal. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning at a manhole at Station 66TJ+61, 32'LT running westerly to a pedestal located at Station 49CH+06, 43'RT where it continues westerly to a pole located at Station 48CH+20, 34'RT. From there it rises up the pole and crosses Chester Street overhead to a pole at Station 48CH+20, 26'LT and beyond the northerly project limits of Chester Street. AT&T Wisconsin will abandon this line in place within the project limits prior to construction.
- An underground communications line beginning at a manhole at Station 66TJ+61, 32'LT running easterly along the south side of Chester Street to a pedestal at

Station 821FH+38, 40' RT. AT&T Wisconsin will abandon this line in place prior to construction.

- An overhead communications line beginning from beyond the project limits of Adler Street running easterly, crossing Adler Street at Station 1020AD+47, to a pole located at Station 1021AD+17, 116'LT. From there it turns and runs southerly, crossing Adler Street at Station 1022AD+61, to a pole at Station 1022AD+80, 37'RT. From there it turns and runs easterly underground along the south side of Adler Street to Station 1023AD+78, 36'RT where it turns and runs southerly to beyond the southerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning beyond the southerly project limits running northerly in the northbound lanes of 84th Street to beyond the northerly project limits. AT&T Wisconsin will remove a transite duct from a manhole at Station 44+76, 35' RT to Honey Creek Parkway prior to construction. AT&T Wisconsin will also lower this line from a manhole at Station 44+76, 35' RT to Station 45F+50, 35' RT and at Station 47F+65, 37' RT prior to construction. Contact Jay Bulanek, (414) 535-7407, of AT&T Wisconsin 10 working days prior to the removal of the existing box culvert and installation of storm sewer pipe P6827 in 84th Street. AT&T Wisconsin will reconnect this communication line once the box culvert has been removed and storm sewer pipe P6827 has been installed. Allow AT&T Wisconsin 2 working days to complete their work. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning from beyond the northerly project limits of O'Connor Street running southerly to a pedestal at Station 742FA+62, 37' LT where it turns and runs westerly to a pedestal at Station 740FA+64, 25'LT. AT&T Wisconsin will abandon this line in place prior to construction.
- An underground communications line beginning at a pedestal at Station 740FA+64, 25'LT running easterly along the north side of O'Connor Street to beyond the easterly project limits of O'Connor Street. This line will remain in place without adjustment.
- An underground communications duct package beginning beyond the southerly project limits running northerly, crossing IH 94 at Station 278EW+56, to beyond the northerly project limits. This line will remain in place without adjustment. Adjust foundations for walls N-40-70, N-40-71 and N-40-81 as necessary to avoid this duct package.
- An underground communications line beginning from beyond the easterly project limits of Burleigh Street running westerly in the median of Burleigh Street to beyond the westerly project limits. This line will remain in place without adjustment.

AT&T Wisconsin will relocate, construct and reconstruct communication facilities in the project area at the following locations prior to construction:

- A new underground communications line beginning at a manhole in Bluemound Road at Station 192BL+05, 19' LT running easterly in the westbound lanes of Bluemound Road to a manhole at Station 194BL+79, 17'LT where it turns and

runs northerly down the middle of 97th Street to a manhole at Station 40TF+30, 1'RT. From there it turns and runs easterly, crossing USH 45 at Station 325NS+20, to a manhole located at Station 41TRN+54, 18'RT. From there it turns and runs southerly down the middle of 95th Street to a manhole in Bluemound Road at Station 202BL+86, 20'LT.

- A new underground communications line beginning at a manhole in Wisconsin Avenue at Station 25WX+26, 34'LT running southerly along the east side of S. 97th Street to a manhole at Station 47TF+08, 34'RT. From there it turns and runs easterly, crossing USH 45 at Station 331NS+54, to a manhole located at Station 47TRN+18, 18'RT. From there it turns and runs northerly in S. 95th Street to a manhole in Wisconsin Avenue at Station 32WX+56, 34'LT.
- A new underground communications line beginning from beyond the northerly project limits of Chester Street running southerly to Station 48CH+18, 6' LT where it turns and runs easterly in the westbound lanes of Chester Street to Station 51CH+92, 4' RT. From there it turns and runs northerly to beyond the northerly project limits of Chester Street.
- A new underground communications line beginning a manhole at Station 38F+71, 22' RT running northerly in the northbound lanes of S. 84th Street to a manhole at Station 44F+75, 34' RT.
- A new underground communications line beginning at a manhole at Station 38F+71, 22' RT running westerly to beyond the westerly project limits of S. 84th Street.

AT&T Wisconsin also has abandoned facilities within the project limits in the following locations:

- An underground communications line beginning beyond the southerly project limits running northerly, crossing IH 94 at Station 155EW+00, to beyond the northerly project limits.
- An underground communications line beginning at Station 987AD+34, 22'RT running northerly to Station 987AD+37, 27'LT where it turns and runs easterly on the north side of Adler Street to a manhole at Station 995AD+16, 16'LT.

Contact Jay Bulanek, (414) 535-7407 office, of AT&T Wisconsin 7 days in advance to coordinate locations and any excavation near their facilities."

American Transmission Company has overhead 138kv electric transmission lines within the project limits in the following locations:

- Two overhead 138kv electric transmission lines beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running northwesterly, crossing IH 94 between Station 125EW+00 to 126EW+50, to beyond the northerly project limits of IH 94. These lines will remain in place without adjustment.
- Three overhead 138kv electric transmission lines beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running southeasterly along the south side of IH 94 where they turn and runs northeasterly, crossing IH 94 between Station

171EW+35 to Station 174EW+78, and continue northeasterly, crossing USH 45 between Station 299NS+50 to Station 302NS+08, to 96th Street Substation in the northeast quadrant of the Zoo Interchange. These lines will remain in place without adjustment.

- Two overhead electric transmission lines beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running southerly, crossing IH 94 between Station 196EW+92 to Station 198EW+68, and continuing southerly along the east side of USH 45/IH 894 to beyond the southerly project limits. ATC will remove these lines and towers prior to and during construction. Contact Barbra Mikolajczyk, (262) 506-6804 of American Transmission Company to coordinate tower staging and construction activities.
- An underground electric transmission line beginning from beyond the northerly project limits running southerly in the median of S. 70th Street to beyond the southerly project limits. This line will remain in place without adjustment.

ATC will be constructing overhead electric transmission towers and pulling new overhead circuits prior to and during the project in the following locations:

South Leg (West Circuit)	South Leg (East Circuit)	North Leg Circuit
-Station 238NS+53, 195'RT	-Station 238NS+59, 294'RT	-Station 306NS+17, 524'RT
-Station 245NS+03, 130'RT	-Station 244NS+72, 220'RT	-Station 307NS+86, 354'RT
-Station 249NS+59, 105'RT	-Station 249NS+75, 179'RT	-Station 311NS+28, 195'RT
-Station 255NS+95, 106'RT	-Station 256NS+21, 181'RT	-Station 315NS+29, 186'RT
-Station 262NS+24, 108'RT	-Station 262NS+69, 183'RT	-Station 318NS+72, 174'RT
-Station 268NS+01, 111'RT	-Station 267NS+02, 185'RT	-Station 322NS+32, 215'RT
-Station 271NS+31, 112' LT	-Station 271NS+35, 187' LT	-Station 326NS+82, 206'RT
-Station 277NS+37, 142' LT	-Station 277NS+28, 217' LT	-Station 330NS+25, 172'RT
-Station 282NS+55, 225' LT	-Station 282NS+23, 288' LT	-Station 334NS+04, 256'RT
-Station 288NS+07, 399' LT	-Station 288NS+21, 517' LT	-Station 337NS+03, 397'RT
-Station 293NS+44, 578' LT	-Station 293NS+60, 707' LT	-Station 340NS+43, 329'RT
		-Station 343NS+86, 230'RT
		-Station 347NS+13, 161'RT
		-Station 349NS+75, 155'RT
		-Station 353NS+26, 239'RT
		-Station 355NS+95, 463'RT

Coordinate construction activities with ATC. Due to outage constraints for the multi-state electric grid, these transmission lines cannot be de-energized during construction. Use caution when operating overhead equipment in this area and maintain OSHA safe working clearance to the overhead conductors at all times. Notify ATC 48 hours before beginning any work within or around overhead electric transmission lines.

ATC also has abandoned underground electric lines within the project limits in the following locations:

- An underground 138kv electric transmission line beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running northeasterly, crossing the Hank Aaron State Trail at Station 130HA+65, to Station 143EW+44, 165'RT where it turns and runs southeasterly, crossing STH 100 at Station 568SN+81, to Station 169EW+62, 103'RT. From there it turns and runs northeasterly, crossing IH 94 in a We Energies tunnel at Station 171EW+15, and continues northeasterly, crossing USH 45 in a We Energies tunnel at Station 301NS+65, to 96th Street Substation in the northeast quadrant of the Zoo Interchange.
- An underground 138kv electric transmission line beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running northeasterly, crossing the Hank Aaron State Trail at Station 131HA+42, to Station 143EW+43, 196'RT, where it turns and runs southeasterly, crossing STH 100 at Station 568SN+11, to Station 169EW+82, 142'RT. From there it turns and runs easterly to Station 171EW+23, 112'RT where it turns and runs northeasterly, crossing IH 94 at Station 172EW+56, continues northeasterly, crossing USH 45 at Station 301NS+17, to 96th Street Substation in the northeast quadrant of the Zoo Interchange.

Contact Jim Briggs, (414-651-1830), of American Transmission Company 7 days in advance to coordinate locations and any excavation near their facilities.

Midwest Fiber Network has existing underground communications line in a WisDOT conduit package beginning beyond the westerly project limits of Bluemound Road running easterly in the median of Bluemound Road to a vault at Station 194BL+45, 8' LT where it turns and runs northeasterly, crossing Bluemound Road, to a vault at Station 196BL+40, 69' LT. From there it turns and runs northwesterly to a STOC cabinet at Station 196BL+11, 130' LT. Midwest Fiber network will remove this cable from the vault at Station 194BL+45, 8' LT to the STOC cabinet at Station 196BL+11, 130' LT prior to construction. The remaining portions of this line will remain in place without adjustment.

Prior to construction, Midwest Fiber Networks will construct a new line from a vault at Station 194BL+45, 8' LT running northeasterly, crossing Bluemound Road, to the north side of Bluemound Road where it turns and runs northerly to a manhole at Station 40+19, 39' LT. From there it turns and runs easterly, crossing USH 45 at Station 324NS+93, to a manhole at Station 41TRN+25, 48' LT. From there it turns and runs southerly along the west side of S. 95th Street, crossing Bluemound Road, and continues southerly along the west side of S. 95th Street to beyond the southerly project limits of S. 95th Street.

Contact Richard Trgovec, (414) 459-3554 office, of Midwest Fiber Network 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Cable has existing cable facilities in City of Milwaukee conduit within the project limits in the following locations:

- An underground cable in City of Milwaukee - Conduit beginning beyond the southerly project limits and running northerly in the southbound lanes of S. 68th Street

to beyond the northerly project limits. This line will remain in place without adjustment.

- An underground cable in City of Milwaukee - Conduit beginning beyond the southerly project limits and running northerly along the west side of S. 76th Street to a manhole at Station 263EW+91, 186'RT where it turns and runs westerly in the westbound lanes of Kearney Street to a manhole at Station 755FB+19, 55'RT. From there it turns and runs northerly, crossing IH 94 at Station 255EW+31, to a manhole at Station 555CR+16, 4' LT where it turns and runs westerly along the north side of O'Connor Street to a manhole at Station 548CR+33, 20' LT. From there it continues westerly in the westbound lanes of O'Connor Street to a manhole at Station 741FA+04, 10' LT where it turns and runs northerly to a manhole at Station 740FA+51, 247' LT. From there it turns and runs westerly through the Milwaukee Firehouse to a manhole in S. 84th Street at Station 45F+51, 12' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning at a manhole at Station 548CR+33, 20' LT and running northerly along the west side of S. Honey Creek Drive to beyond the northerly project limits of O'Connor Street. This line will remain in place without adjustment.
- An underground cable in City of Milwaukee - Conduit beginning at a manhole at Station 741FA+03, 8' LT and running westerly to a manhole at Station 42F+29, 11' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning beyond the northerly project limits and running southerly in the southbound lanes of S. 84th Street to a manhole at Station 36F+82, 20' LT where it turns and runs westerly in the westbound lanes of Adler Street to an manhole at Station 995AD+68, 28' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning beyond the northerly project limits and running southerly in the northbound lanes of S. 92nd Street, crossing IH 94 on the S. 92nd Street Structure, to a manhole at Station 995AD+68, 28' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning beyond the easterly project limits of Bluemound Road and running westerly in the median of Bluemound Road to a manhole at Station 203BL+48, 7' LT where it turns and runs southerly to Station 203BL+32, 36'RT. From there it turns and runs westerly in the eastbound lanes of Bluemound Road, crossing USH 45 on the Bluemound Road Structure, to a manhole at Station 192BL+33, 47'RT where it turns and runs southerly into the Milwaukee County Zoo. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

Contact Brian Pawlak, (414) 286-5970 office, of the City of Milwaukee - Cable 7 days in advance to coordinate locations and construction activities.

Milwaukee, City of - Conduit has underground communication conduit within the project limits in the following locations:

- An underground communications line beginning beyond the southerly project limits and running northerly in the southbound lanes of S. 68th Street to beyond the northerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning beyond the southerly project limits running northerly along the west side of S. 76th Street to a manhole at Station 263EW+91, 186'RT where it turns and runs westerly in the westbound lanes of Kearney Street to a manhole at Station 755FB+19, 55'RT. From there it turns and runs northerly, crossing IH 94 at Station 255EW+31, to a manhole at Station 555CR+16, 4' LT where it turns and runs westerly along the north side of O'Connor Street to a manhole at Station 548CR+33, 20' LT. From there it continues westerly in the westbound lanes of O'Connor Street to a manhole at Station 741FA+04, 10' LT where it turns and runs northerly to a manhole at Station 740FA+51, 247' LT. From there it turns and runs westerly through the Milwaukee Firehouse to a manhole in 84th Street at Station 45F+51, 12' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning at a manhole at Station 548CR+33, 20' LT running northerly along the west side of S. Honey Creek Drive to beyond the northerly project limits of O'Connor Street. This line will remain in place without adjustment.
- An underground communications line beginning at a manhole at Station 741FA+03, 8' LT running westerly to a manhole at Station 42F+29, 11' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning beyond the northerly project limits running southerly in the southbound lanes of S. 84th Street to a manhole at Station 36F+82, 20' LT where it turns and runs westerly in the westbound lanes of Adler Street to an manhole at Station 995AD+68, 28' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning from beyond the northerly project limits and running southerly in the northbound lanes of S. 92nd Street, crossing IH 94 on the S. 92nd Street Structure, to a manhole at Station 995AD+68, 28' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning beyond the easterly project limits of Bluemound Road running westerly in the median of Bluemound Road to a manhole at Station 203BL+48, 7' LT where it turns and runs southerly to Station 203BL+32, 36'RT. From there it turns and runs westerly in the eastbound lanes of Bluemound Road, crossing USH 45 on the Bluemound Road Structure, to a manhole at Station 192BL+33, 47'RT where it turns and runs southerly into the Milwaukee County Zoo. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

City of Milwaukee - Conduit also has abandoned facilities within the project limits in the following locations:

- An underground communications line beginning at a manhole at Station 564CR+61, 06' LT running westerly along the north side of O'Connor Street to a manhole at Station 555CR+16, 4' LT.
- An underground communications line beginning at a manhole at Station 548CR+33, 20' LT and running westerly along the north side of O'Connor Street to a manhole at Station 741FA+04, 9' LT.

Contact Karen Rogney, (414) 286-3243, of the City of Milwaukee – Conduit 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Lighting has overhead and underground street lighting facilities along Adler Street, Kearney Street, Chester Street, O'Connor Street, S. 70th Street, S. 73rd Street Pedestrian Bridge, S. 76th Street, S. 84th Street, S. 92nd Street, S. 95th Street, Bluemound Road, and Wisconsin Avenue. The City of Milwaukee will install interim overhead lighting facilities and remove permanent lighting required for construction. City forces will install permanent lighting facilities during construction and will need a minimum of 15 working days to install the permanent overhead.

Contact Dennis Miller (414) 286-5942 office / (414) 708-4251 cell) or George Berdine, (414) 708-4245 or Thomas Hughs, (414) 286-3457 office / (414) 708-3175 cell, of the City of Milwaukee - Lighting 10 days in advance to coordinate installation of the interim lighting as well as the removal, reconstruction, and reconnection of the street lighting system.

Milwaukee, City of - Sanitary has sanitary sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 984AD+32, 12'RT running easterly down the middle of Adler Street to a manhole at Station 989AD+82, 4'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 990AD+75, 26'RT running easterly along the south side of Adler Street to a manhole at Station 995AD+52, 23'RT where it turns and runs northeasterly to a manhole at Station 995AD+77, 3' LT. From there it turns and runs easterly in the middle of Adler Street to a MMSD manhole in S. 84th Street at Station 37F+08, 13'RT. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning in Adler Street running southerly to beyond the southerly project limits in the following streets: S. 94th Place, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street. These lines will remain in place without adjustment.
- An underground sanitary sewer beginning at a manhole at Station 137KE+42, 4'RT running easterly along the south side of Kearney Street to beyond the eastern project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 45CH+21, 17'RT running easterly in the middle of Chester Street to a manhole at Station 49CH+51,

2'RT where it turns and runs northerly to beyond the northern project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

- An underground sanitary sewer beginning at a manhole at Station 67TJ+47, 23'RT running northerly in the middle of the northbound lanes of S. 92nd Street to beyond the northern project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 52CH+93, 4'RT running easterly along the north side of Chester Street to a manhole at Station 59CH+49, 32'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 1005AD+12, 3' LT running northerly to a manhole at Station 1005AD+14, 25' LT and continues northerly, crossing IH 94 at Station 220EW+13, to a manhole at Station 59CH+49, 32'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 737FA+74, 45' LT running easterly in the middle of O'Connor Street to a manhole at Station 561CH+32, 8' LT where it turns and runs northerly to beyond the northerly project limits of O'Connor Street. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning from beyond the southern project limits running northerly in the middle of S. 84th Street to a manhole at Station 36F+86, 2'RT where it turns and runs northwesterly to a manhole at Station 36F+93, 12'. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning from beyond the easterly project limits of S. 84th Street running southwesterly to a manhole at Station 47F+12, 67'RT where it turns northwesterly to manhole at Station 47F+81, 1' LT. From there it turns and runs easterly to a MMSD manhole at Station 47F+81, 12'RT. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning in the Milwaukee County Zoo from beyond the westerly project limits running easterly, crossing USH 45 at Station 315NS+81, to a manhole at Station 315NS+96, 146'RT and continues to beyond the easterly project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 41TRN+94, 26' RT running northerly to a manhole at Station 47TRN+96, 32' RT. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 330NS+10, 432' RT and running westerly, crossing USH 45 at Station 329NS+75, to a manhole at Station 329NS+65, 94' LT. From there it turns northerly to a manhole at Station 333NS+99, 133' LT where it turns and runs westerly to a manhole at Station 333NS+82, 315' LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 195BL+67, 45' RT running westerly along the south side of Wisconsin Avenue to beyond the westerly

project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.

- An underground sanitary sewer beginning at a manhole at Station 203BL+43, 53' RT running easterly along the south side of Wisconsin Avenue to beyond the easterly project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 203BL+35, 55' LT running easterly along the north side of Wisconsin Avenue to beyond the easterly project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning in the median of S. 84th Street at a MMSD manhole at Station 44F+96, 12' RT running westerly to a manhole at Station 44F+95, 61' LT and continues westerly to a manhole at Station 44F+98, 100' LT. From there it turns into a private sanitary sewer continuing westerly to beyond the westerly project limits of S. 84th Street. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.

City of Milwaukee - Sanitary also has abandoned facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at Station 231EW+26, 133' RT running easterly to Station 239EW+00, 67' LT.
- An underground sanitary sewer beginning at Station 234EW+52, 42' RT running easterly to Station 235EW+16, 291' RT.
- An underground sanitary sewer beginning at a manhole at Station 36F+85, 2' RT running northerly in the median of S. 84th Street to a manhole at Station 39F+42, 2' RT.
- An underground private sanitary sewer beginning at Station 735FD+52, 130' LT running southwesterly to a manhole at Station 734FD+42, 39' LT. From there it turns westerly to a manhole at Station 728FD+51, 19' RT where it turn and runs northerly to beyond the northerly project limits of IH 94.
- An underground private sanitary sewer beginning at Station 729FD+70, 18' RT running northerly to beyond the northerly project limits of IH 94.

Contact Jason Barman, (414) 286-3267 office, of the City of Milwaukee - Sanitary 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Signals has existing signal facilities at the IH 94 on/off ramps of 68th Street, at the IH 94 on/off ramps of 70th Street, at the IH 94 on/off ramps of 76th Street, at Wisconsin Avenue/ S. 95th Street intersection, and at Wisconsin Avenue/ S. 97th Street intersection. Abandon, remove, leave in place, and reconstruct these facilities at the IH 94 on/off ramps of 70th Street as shown in the plans.

Contact Al Nichols, Traffic Operations Supervisor, (414) 286-3686 office / (414) 708-5148 cell, of City of Milwaukee - Signals or Mr. Joseph Blakeman, Traffic Control Engineer, (414) 286-8070, of City of Milwaukee - Signals 10 working days prior to signal

changes between staging sequencing at Wisconsin Avenue/ S. 95th Street intersection and at Wisconsin Avenue/ S. 97th Street intersection. Allow City of Milwaukee forces 5 working days to complete signal modifications.

Contact Al Nichols, (414) 286-5941 office / (414) 708-5148 cell, of the City of Milwaukee - Signals 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Water has underground water facilities within the project limits in the following locations:

- An underground water main beginning from beyond the westerly project limits running easterly along the south side of Bluemound Road to Station 195BL+15, 64' RT where it turns and runs southeasterly to Station 195BL+51, 120' RT. From there it turns and runs easterly, crossing USH 45 at Station 321NS+30, to Station 198BL+75, 200' RT where it turns and runs northeasterly to Station 199BL+31, 54' RT. From there it turns and runs easterly along the south side of Bluemound Road to beyond the easterly project limits of Bluemound Road. This line will remain in place without adjustment.
- An underground water main beginning at Station 202BL+78, 55' RT running southerly in the southbound lanes of S. 95th Street to beyond the southerly project limits of S. 95th Street. This line will remain in place without adjustment.
- An underground water main beginning from beyond the easterly project limits of Bluemound Road running westerly along the north right-of-way of Bluemound Road to Station 202BL+60, 62' LT where it turns and runs northerly along the east right-of-way of S. 95th Street to Station 32WX+50, 16' RT. From there it turns and runs easterly in the eastbound lanes of Wisconsin Avenue to beyond the easterly project limits of Wisconsin Avenue. This line will remain in place without adjustment.
- An underground water main beginning from beyond the easterly project limits of USH 45 running westerly, crossing USH 45 at Station 314NS+27, to Station 314NS+08, 136' LT where it turns and runs southwesterly along the west right-of-way of USH 45 to Station 492NW+43, 45' RT. From there it turns and runs westerly to beyond the westerly project limits of USH 45 into the Milwaukee County Zoo. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning from beyond the southerly project limits of Adler Street running northerly to Station 983AD+79, 12' RT where it turns and runs easterly in the eastbound lanes of Adler Street to Station 987AD+27, 5' RT. From there it turns and runs northwesterly to Station 987AD+55, 19' LT where it turns and runs easterly in the westbound lanes of Adler Street to a water main in S. 84th Street at Station 36F+71, 18' RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning in Adler Street running southerly beyond the southerly project limits in the following streets: S. 94th Place, S. 94th Street, S. 93rd Street, S. 92nd Street, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street. Abandon, remove, leave in place, and reconstruct the lines in S. 87th Place, S. 87th Street, and

S. 86th Street as shown in the plans. The remaining lines will remain in place without adjustment.

- An underground water main beginning from beyond the northerly project limits of Chester Street running southerly in the median of Chester Street to Station 43CH+56, 6' RT where it turns and runs easterly in the westbound lanes of Chester Street to Station 59CH+51, 42' RT. From there it turns and runs northerly to beyond the northern project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning at Station 49CH+60, 7' LT running northerly along the west side of S. 92nd Street to beyond the northerly project limits of S. 92nd Street. This line will remain in place without adjustment.
- An underground water main beginning from beyond the northerly project limits running southerly down the northbound lanes of S. 92nd Street to Station 66TJ+83, 16' RT where it turns and runs southeasterly to Station 66TJ+40, 52' RT. From there it turns and runs southerly, crossing IH 94 at Station 211EW+03, to where it tees into a water main in Adler Street at Station 63TJ+55, 52' RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning at Station 1009AD+88, 12' LT running northerly, crossing IH 94 at Station 224EW+87, to beyond the northerly project limits of IH 94. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning from beyond the southerly project limits running northerly in the southbound lanes of S. 84th Street to Station 36F+71, 17' LT. This line will remain in place without adjustment.
- An underground water main beginning from beyond the southerly project limits running northerly in the northbound lanes of S. 84th Street to beyond the northerly project limits. This line will remain in place without adjustment.
- An underground water main beginning in S. 84th Street at Station 43F+17, 41' RT running easterly in the westbound lanes of O'Connor Street to beyond the eastern project limits of O'Connor Street. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning in O'Connor Street running northerly beyond the northerly project limits in the following streets: S.83rd Street, S. 82nd Street, Honey Creek Drive, S. 80th Street, and S. 79th Street. These lines will remain in place without adjustment.
- An underground water main beginning at Station 46F+40, 43' RT running northeasterly along the south side of Honey Creek Parkway to beyond the westerly project limits of S. 84th Street.
- An underground water main running north-south, crossing IH 94 at Station 262EW+18. This line will remain in place without adjustment.
- An underground water main beginning from beyond the southerly project limits running northerly in S. 68th Street to beyond the northerly project limits. This line will remain in place without adjustment.

Additionally, The City of Milwaukee owns and operates a Water Booster Station near Station 1011AD+00, 28' LT. Salvage and abandon the existing Water Booster Station

according to the plan. Install a new Water Booster Station near Station 1019AD+50, 34' LT as shown in the plans.

City of Milwaukee water also has abandoned facilities within the project limits in the following locations:

- An underground water main beginning at Station 195BL+51, 120' RT and running easterly on the south side of Bluemound Road, crossing USH 45 at Station 322NS+10, to Station 199BL+71, 58' RT.
- An underground water main beginning at Station 43CH+55, 5' LT running southerly to Station 43CH+84, 39' LT where it turns and runs westerly in Chester Street to Station 45CH+30, 5' RT.
- An underground water main beginning at Station 36F+81, 17' LT running northerly in the southbound lanes of S. 84th Street to Station 39F+77, 15' LT where it turns and runs easterly to Station 39F+77, 18' RT.
- An underground water main beginning at Station 38F+50, 18' RT running northerly in the northbound lanes of S. 84th Street to Station 39F+99, 18' RT.
- An underground water main beginning at Station 231EW+02, 131' RT running easterly to Station 238EW+79, 70' LT.
- An underground water main beginning at Station 234EW+57, 32' RT running southerly to Station 235EW+27, 303' RT.
- An underground water main running north-south throughout the project limits, crossing IH 94 at Station 264EW+31.

Contact Dave Goldapp, (414) 286-6301, of City of Milwaukee - Water 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee County – Electric and Communications has an underground electric line and a communication line beginning at an existing vault at Station 172EW+16, 307' RT running northwesterly together to a vault at Station 171EW+08, 212' RT where it turns and runs northerly in the center of the existing Zoo Maintenance Tunnel to a vault at Station 171EW+48, 146' LT and continues northerly to beyond the northerly project limits. These lines will remain in place without adjustment.

Milwaukee County Electric and Communications also has abandoned facilities within the project limits in the following locations:

- An underground electric and communications line beginning at a vault at Station 172EW+16, 307' RT running northwesterly to the Zoo Maintenance Tunnel at Station 171EW+35, 177'RT. The line then continues on the north side of the Zoo Maintenance Tunnel at Station 171EW+54, 105'LT where it turns and runs northwesterly to a vault at Station 171EW+48, 146' LT.
- An underground communications line beginning from beyond the easterly project limits of USH 45 running westerly, crossing USH 45 at Station 345NS+50, to Station 345NS+47, 69' LT where it turns and runs northerly along the west fence of USH 45 to beyond the northerly project limits.

Contact Karl Hackbarth, (414) 256-5413 office, of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee County - Sanitary has no utility facilities within the project limits.

Milwaukee County – Storm has existing underground storm sewer facilities within the project limits in the following locations;

- An underground storm sewer beginning at an inlet at Station 571SW+42, 23’ LT running easterly, crossing the Zoo Maintenance Path to a inlet at Station 571SW+55, 27’ LT where it turns and runs northerly to an inlet at Station 571SW+83, 44’ LT and continues northerly into the Milwaukee County Zoo, beyond the northerly project limits of IH 94. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground storm sewer beginning at an inlet at Station 43XJ+88, 240’ LT running southwesterly through the Milwaukee County Zoo parking lot to an inlet at Station 42XJ+83, 434’ LT where it turns and runs southerly to an inlet at Station 495NW+37, 58’ LT. From there it turns and runs southwesterly into the Milwaukee County Zoo, beyond the westerly project limits of the NW ramp. This line will remain in place without adjustment.
- An underground storm sewer beginning at an inlet at Station 195BL+08, 90’ RT and running northerly to a manhole at Station 195BL+11, 73’ RT where it turns and runs westerly along the south side of Bluemound Road to a manhole at Station 192BL+33, 47’ RT. From there it turns and runs northerly and connects into a City of Wauwatosa storm sewer. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

Contact Karl Hackbarth, (414) 256-5413 office),of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee County – Water has an underground water main beginning at the Milwaukee County Zoo running southerly, east of the Zoo Maintance Tunnel and crossing IH 94 at Station 172EW+71, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.

Milwaukee County Water also has an abandoned water main beginning from beyond the easterly project limits of USH 45running westerly, crossing USH 45 at Station 345NS+47, to beyond the westerly project limits of USH 45.

Contact Karl Hackbarth, (414) 256-5413 office, of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

MMSD has existing underground sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning from beyond the southerly project limits of IH 94 running northerly along the east side of Underwood Parkway South, crossing under IH 94 at Station 101EW+73, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground sanitary sewer beginning from beyond the southerly project limits of S. 116th Street running northerly in the median of S. 116th Street, crossing IH 94 at Station 127EW+20, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground sanitary sewer beginning from beyond the northerly project limits of IH 94 running southerly along the east side of HWY 100 to a manhole at Station 575SS+69, 65' RT where it turns and runs southeasterly to a manhole at Station 574SS+93, 123' RT. From there it turns and runs southerly, crossing IH 94 at Station 156EW+72, to a manhole at Station 566SS+67, 133' RT where it turns and runs westerly to a manhole at Station 566SS+56, 70' RT. From there it turns and runs southerly along the east side of HWY 100 to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.
- A 39" MIS sanitary sewer beginning from beyond the westerly project limits of HWY 100 running easterly, crossing HWY 100 at Station 564+30, and continues easterly, crossing IH 94 at Station 168EW+88, to a manhole at Station 480NW+25, 41' RT. From there it turns and runs northeasterly to a manhole at Station 483NW+44, 36' RT where it turns and runs northerly through the Milwaukee County Zoo parking lot to a manhole in Bluemound Road at Station 186BL+91, 20' LT. From there it turns and runs easterly to a manhole at Station 188BL+62, 20' LT where it turns and runs northerly in the northbound lane of N. 99th Street to a manhole in Wisconsin Avenue at Station 18WX+78, 11' LT. From there it turns and runs easterly in the westbound lanes of Wisconsin Avenue, crossing USH 45 at Station 334NS+43, to beyond the easterly project limits of Wisconsin Avenue. This line will remain in place without adjustment. MMSD will install a cured-in-place liner in the existing 39" MIS between a manhole at Station 474NW+41, 18' RT and a manhole Station 484NW+49, 132' LT prior to and during construction. The lining project will be completed by December 31st, 2014. The general sequence of work includes: 1) cleaning and televising of the pipe segment, 2) insertion of the liner, which will include erection of a liner-insertion tower above the manholes, 3) curing of the liner material using hot water at approximately 180 degrees-F for a period up to 36 hours, and 4) pressure testing and reconnection of the pipeline segments. Access to city water is required during the curing process. Access to a sanitary sewer is required during cleaning. Work will proceed up to 24 hours per day. The MMSD will by-pass the liner project area by pumping from an existing manhole at Station168EW+60, 9'RT and running above ground lines to an existing manhole at Station 491NW+20, 545'LT. It is anticipated that the by-pass pumping operation will utilize the existing Zoo maintenance tunnel to cross below IH 94. Contact Debra Jensen (414-225-2143) of MMSD to coordinate construction activities in the area of the liner project and associated by-pass pumping operations.
- An underground sanitary sewer beginning at a manhole at Station 165EW+33, 157' RT running southerly, crossing the Hank Aaron State Trail at Station 156HA+08, to S. 105th Street. This line will remain in place without adjustment.

- A 96" MIS sanitary sewer beginning from beyond the southerly project limits of S. 84th Street running northerly along the southbound lanes of S. 84th Street to beyond the northerly project limits of S. 84th Street. This line will remain in place without adjustment.
- An underground sanitary sewer beginning from beyond the southerly project limits of S. 84th Street running northerly in the southbound lanes of S. 84th Street to a manhole at Station 35F+52, 27' LT where it turns and runs northeasterly to a manhole at Station 36F+84, 12' RT. From there it turns and runs northerly in the median of S. 84th Street to a manhole at Station 37F+08, 13' RT and continues northerly to a manhole at Station 37F+33, 14' RT where it turns westerly and connects into the 96" MIS sewer at Station 37F+36, 33' LT. This line will remain in place without adjustment.
- An underground sanitary sewer beginning from beyond the easterly project limits of S. 84th Street running westerly to a manhole at Station 37F+06, 47' RT and continues to a manhole at Station 37+08, 13' RT. This line will remain in place without adjustment.
- An existing flow meter at Station 37+47, 3' RT. This flow meter will remain in place without adjustment.

MMSD also has abandoned sanitary sewer and storm sewer within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 480NW+25, 41' RT running easterly to an abandoned manhole at Station 482NW+87, 144' RT where it turns and runs to a manhole at Station 483NW+43, 36' RT.
- An underground sanitary sewer beginning at a manhole at Station 575SS+70, 66' RT running southerly along the east side of HWY 100, crossing IH 94 at Station 156EW+64, to a manhole at Station 566SS+56, 70' RT.
- An underground sanitary sewer beginning in the median of S. 84th Street at a manhole at Station 36F+84, 11' RT running easterly to a manhole at Station 36F+86, 32' RT where it turns and runs northeasterly to a manhole at Station 37F+06, 47' RT.
- An underground sanitary sewer beginning in the northbound lanes of S. 84th Street at a manhole at Station 36F+86, 32' RT running northerly to a manhole at Station 37F+24, 37' RT.
- An underground storm sewer overflow beginning in the median of S. 84th Street at a manhole at Station 37F+08, 12' RT running northeasterly to a manhole at Station 37F+24, 37' RT where it turns and runs northerly to Station 39F+29, 37' RT. From there it turns and runs northwesterly to an existing storm sewer at Station 40F+07, 8' LT.
- An underground sanitary sewer beginning in the median of S. 84th Street at a manhole at Station 37F+33, 14' RT running northerly in the northbound lanes of S. 84th Street to a manhole at Station 43F+35, 14' RT.

The MMSD will adjust manholes throughout the project limits during construction. Contact Debra Jensen, (414) 225-2143, of MMSD 5 days prior to any paving operations to coordinate manhole adjustments.

Contact Debra Jensen, (414) 225-2143, of MMSD 7 days in advance to coordinate locations and any excavation near their facilities.

Sprint has an underground communications line beginning from beyond the northerly project limits of IH 94 running southerly approximately 5' west of the east right-of-way of the Union Pacific Railroad, crossing IH 94 at Station 161EW+17, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.

Sprint also has an abandoned communications line beginning beyond the northerly project limits of IH 94 running southerly approximately 20' east of the west right-of-way of the Union Pacific Railroad, crossing IH 94 at Station 159EW+09, to beyond the southerly project limits of IH 94.

Contact James Burton, (708) 955-6659, of Sprint 7 days in advance to coordinate locations and any excavation near their facilities.

TCA has underground and overhead communication facilities within the project limits in the following location:

- An overhead communications line beginning beyond the northerly project limits running southeasterly on We Energies poles, crossing IH 94 at Station 123EW+57, to a pole at Station 124EW+14, 185' RT where it turns and runs easterly to a pole at Station 130EW+51, 192' RT. From there it drops to an underground facility and runs northerly to the previously described AT&T Corporation line at Station 130EW+79, 126' LT where it turns and runs joint with AT&T Corporation in the Hank Aaron State Trail to Station 153HA+44, 25' LT. From there it turns and runs south to a We Energies pole at Station 153HA+44, 53' RT beyond the southerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning from beyond the westerly project limits of Schlinger Avenue running easterly along the north side of Schlinger Avenue to a We Energies pole at Station 531SCH+79, 33' LT where it turns and runs overhead along the east right-of-way of IH 894/ USH 45 to a pole at Station 182HA+95, 93' RT. From there it turns and runs easterly to beyond the easterly project limits of USH 45. TCA will adjust this line near Station 529SCH+75, 25' LT prior to construction. The remaining portion of this line will remain in place without adjustment.
- An overhead communications line beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 276EW+95, to beyond the northerly project limits. TCA will raise this line over IH 94 prior to construction.

TCA also has an abandoned underground communications line beginning at a handhole at Station 530SCH+33, 25' LT and running northeasterly to Station 784GE+67, 197' RT.

Contact Debbie Sadler, (414) 459-3572 office / (414) 651-0036 cell, of Northwind Technical Services 7 days in advance to coordinate locations and any excavation near their facilities.

Time Warner Cable has existing overhead and underground communications facilities within the project limits in the following locations:

- An overhead communications line beginning from beyond the southerly project limits of USH 45 running northerly on We Energies poles along the west side of IH 894 / USH 45 to a pole at Station 228NS+64, 198' LT. Time Warner Cable will relocate this line to new We Energies poles prior to construction.
- An overhead communications line beginning from beyond the southerly project limits of S. 100th Street running northerly on We Energies poles along the east side of S. 100th Street to a pole at Station 43TD+92, 25' RT. Time Warner Cable will relocate this line outside the project limits prior to construction.
- An overhead communications line beginning from beyond the southerly project limits of USH 45 running northerly on We Energies poles along the east right-of-way of IH 894/ USH 45 to a pole at Station 775GE+80, 50' RT where it turns and runs northeasterly, crossing Schlinger Avenue at Station 531SCH+73, to a pole at 780GE+92, 60' RT. From there it turns and runs easterly along the north side of Schlinger Avenue to beyond the easterly project limits of Schlinger Avenue. This line will remain in place without adjustment.
- An overhead communications line beginning from beyond the easterly project limits of USH 45 running westerly to a We Energies pole at Station 808BB+42, 132' RT where it turns and runs northerly along the east right-of-way of USH 45 to a pole at Station 822BB+98, 31' LT. From there it turns and runs easterly to a pole at Station 199BL88+63' RT where it turns and runs westerly, crossing USH 45 at Station 322NS+21, to a pole at Station 194BL+59, 50' RT. From there it turns into an underground line and runs northerly to a manhole at Station 194BL+66, 7' RT. Time Warner Cable will abandon the underground portions in place and relocate the overhead portions throughout the project limits prior to construction.
- An underground communications line beginning at a manhole at Station 194BL+66, 7' RT running westerly in the median of Bluemound Road to beyond the westerly project limits of Bluemound Road. Time Warner Cable will abandon this line in place from the manhole at Station 194BL+66, 7' RT to Station 189+26, 16' RT prior to construction.
- An overhead communications line on We Energies poles beginning from beyond the westerly project limits of S. 97th Street running easterly to a pole at Station 39TF+69, 108' LT where it turns into an underground line and continues easterly to Station 38TF+86, 30' LT. From there it turns and runs southerly, crossing Bluemound Road, to a manhole at Station 194BL+66, 7' RT. Time Warner Cable will abandon the underground portions of this line in place prior to construction.
- An underground communications line beginning at Station 194BL+87, 55' LT running westerly along the north side of Bluemound Road to beyond the westerly project limits. Time Warner Cable will abandon this line in place throughout the project limits prior to construction.

- An underground communications line beginning from beyond the northerly project limits of Kearney Street running southerly to the north right-of-way of Kearney Street at Station 816FH+84, 11' LT where it turns and runs easterly along the north side of Kearney Street to Station 820+73, 4' LT. From there it turns and runs northerly to beyond the northerly project limits of Kearney Street. Time Warner Cable will abandon this line in place prior to construction.
- An overhead communications line on We Energies poles beginning from beyond the westerly project limits of Adler Street running easterly, crossing Adler Street at Station 1020AD+48 to a pole at Station 1021AD+18, 115' RT. This line will remain in place without adjustment.
- An overhead communications line on We Energies poles beginning from beyond the southerly project limits of S. 84th Street running northerly along the east side of S. 84th Street, crossing IH 94 at Station 283EW+11, to beyond the northern project limits of S. 84th Street. Time Warner Cable will relocate this line from Station 37F+03, 55' RT to Station 44F+61, 46' RT prior to construction.
- An overhead communications line on We Energies poles beginning from beyond the southerly project limits of Kearney Street in an ally between S. 76th Street and S. 75th Street running northerly to a pole at Station 266EW+16, 227' RT where it turns and runs easterly along the south side of Kearney Street to a pole at Station 273EW+03, 180' RT. From there it turns into an underground communications line and runs northerly, crossing Kearney Street, to Station 273EW+28, 133' RT where it turns easterly to a pole at 276EW+54, 119' RT. From there it rises up a We Energies pole and runs northerly, crossing IH 94 at Station 276EW+95, to beyond the northerly project limits of O'Connor Street. Time Warner Cable will abandon in place the underground portions of this line and raise the overhead crossing over IH 94 prior to construction.
- An underground communications line beginning from beyond the southerly project limits of Burleigh Street running northerly, crossing Burleigh Street in the area of the temporary Wauwatosa Water Booster Station to beyond the northerly project limits of Burleigh Street. This line will remain in place without adjustment.

Time Warner Cable will relocate, construct and reconstruct communication facilities in the project area at the following locations prior to construction:

- A new underground line beginning at a pole at Station 39TF+69, 108' LT running easterly to a manhole at Station 39TF+72, 37' LT where it continues easterly, crossing USH 45 at Station 324NS+38, to a manhole at Station 201BL+19, 79' LT. From there it turns and runs southerly, crossing Bluemound Road at Station 201BL+19, to Station 201BL+18, 71' RT where it turns and runs westerly to Station 199BL+79, 78' RT. From there it turns and runs southerly to beyond the southerly project limits of Bluemound Road.

Time Warner Cable also has abandoned facilities within the project limits in the following locations:

- Two underground communications lines beginning at a pole at Station 526SCH+17, 47’ RT running easterly along the south side of Schlinger Avenue to Station 531SCH+10, 60’ RT.
- An underground communication line beginning at a pole at Station 36F+85, 51’ RT running northerly along the east side of S. 84th Street where it turns and runs easterly along the south side of Kearney Street to Station 741FB+31, 77’ RT.

Contact Steve Cramer, (414) 277-4045, of Time Warner Cable 7 days in advance to coordinate locations and any excavation near their facilities.

TW Telecom has an existing underground communications line beginning at a manhole at Station 194BL+65, 7’ RT running southerly, crossing Bluemound Road, to a pole at Station 194BL+60, 51’ RT where it turns into an overhead facility and runs westerly along the south side of Bluemound Road on We Energies poles to a pole at Station 192BL+62, 53’ RT. From there it turns and runs southerly to a pole at Station 192BL+60, 75’ RT where it turns into an underground line and runs southwesterly to beyond the southerly project limits of Bluemound Road into the Milwaukee County Zoo. TW Telecom will abandon the underground portion in place from Station 194BL+65, 7’ RT to Station 194BL+60, 51’ RT prior to construction. We Energies will remove the overhead portions of this line within the project limits prior to construction.

TW Telecom will construct a new underground communications line beginning at a manhole at Station 189BL+31, 2’ RT running southerly, crossing Bluemound Road, to Station 189BL+31, 59’ RT where it turns and runs easterly along the south side of Bluemound Road to Station 192BL+54, 59’ RT. From there it turns and runs southerly to a handhole at Station 192BL+55, 80’ RT.

Contact Brahim Gaddour, (414) 908-1027, of TW Telecom 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa, City of - Lighting has existing lighting facilities within the project limits in the following locations:

- Lighting facilities beginning from beyond the westerly project limits of Wisconsin Avenue running easterly along the south side of Wisconsin Avenue, crossing USH 45 on the Wisconsin Avenue Bridge, to a light at Station 31WX+72, 32’ RT. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.
- Lighting facilities beginning at a light at Station 28WX+11, 32’ RT running northerly, crossing Wisconsin Avenue at Station 28WX+09, to a light at Station 28WX+06, 53’ LT where it turns and runs easterly along the north side of Wisconsin Avenue, crossing USH 45 on the Wisconsin Avenue Bridge, to a light at Station 32WX+14, 46’ LT. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

- Lighting facilities beginning at Station 25WX+77, 54’ RT running southerly along the east side of S. 97th Street to a light at Station 41F+42, 16’ RT. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact Bill Wehrley, (414) 479-8929, of City of Wauwatosa - Lighting 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa, City of – Sewer has existing underground sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 195+BL30, 51’ LT running westerly along the north side of Bluemound Road to beyond the westerly project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 39TF+75, 25’ LT running northerly in the median of S. 97th Street to a manhole at Station 25WX+37, 23’ RT where it turns and runs westerly in the east bound lanes of Wisconsin Avenue to a manhole at Station 24WX+48, 23’ RT. From there it turns and runs into a MMSD manhole at Station 24WX+49, 10’ LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a MMSD manhole at Station 127EW+19, 187’ RT running northwesterly to a manhole at Station 125EW+94, 151’ RT and continues northwesterly, crossing IH 94 at Station 123EW+41, to Station 120EW+97, 174’ LT. From there it turns and runs northerly to a manhole at Station 120EW+94, 197’ LT where it turns and runs northwesterly in the center of Ripley Avenue to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

City of Wauwatosa - Sewer has an abandoned sanitary sewer beginning at a manhole at Station 127EW+02, 183’ RT and running northwesterly, crossing IH 94 at Station 123EW+79, to a manhole at Station 120EW+94, 197’ LT.

Contact Bill Wehrley, (414) 479-8929, of City of Wauwatosa - Sewer 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa Water Utility has existing underground water facilities within the project limits in the following locations:

- A 24” transmission water main beginning from beyond the easterly project limits of Wisconsin Avenue running westerly along the north side of Wisconsin Avenue to Station 33WX+44, 52’ LT where it turns and runs northwesterly to Station 33WX+00, 76’ LT. From there it turns and runs westerly, crossing USH 45 at Station 355NS+08, to Station 24WX+92, 76’ LT where it turns and runs southwesterly to Station 24WX+49, 55’ LT. From there it turns and runs westerly to beyond the westerly project limits of Wisconsin Avenue. Abandon, remove, leave in place, and reconstruct this line as shown in the plans. Additionally, a temporary

Water Booster Station and associated water main at Burleigh Street is necessary to construct as part of this relocation. Construct the temporary Water Booster Station and associated water main as shown in the plans.

- An underground water main beginning from beyond the easterly project limits of Burleigh Street running westerly in the median of Burleigh Street to beyond the westerly project limits. Construct the temporary Water Booster Station and associated water main in this area as shown in the plans.
- An underground water main beginning from beyond the westerly project limits running easterly along the north side of W. Fairview Avenue, crossing Curtis Road, to Station 115EW+65, 136' LT where it turns and runs northerly along the east side of N. 120th Street to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

Contact Jim Wojcehowicz, (414) 479-8965, of the Wauwatosa Water Utility 7 days in advance to coordinate locations and any excavation near their facilities.

We Energies – Electric has overhead and underground electric facilities within the project limits in the following locations:

- An overhead electric line beginning from beyond the southerly project limits of IH 94 running northerly to Station 103EW+50, 151'RT where it turns northeasterly, crossing IH 94 at Station 103EW+96, to Station 104EW+42, 151'LT and continues northerly to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An overhead electric line beginning from beyond the westerly project limits of W. Fairview Avenue running easterly along the north side of W. Fairview Avenue, crossing N. 121st Street, to a pole at Station 113EW+94, 183'LT where it turns and runs northerly to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- Two overhead electric lines running parallel beginning from beyond the northerly project limits of IH 94 running southerly to Station 123EW+17, 149'LT where it turns and runs southeasterly, crossing IH 94 at Station 123EW+68, to Station 124EW+30, 166'RT. From there one line turns and runs easterly along the south side of W. Fairview Avenue, crossing W. Fairview Avenue at Station 24FV+98, to beyond the easterly project limits of Fairview Avenue. The other line continues southerly to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.
- An underground electric duct package beginning from beyond the northerly project limits of IH 94 running southerly along the east right-of-way of HWY 100, crossing IH 94 at Station 158EW+00, to beyond the southerly project limits of IH 94. This duct package will remain in place without adjustment.
- An underground electric duct package beginning from beyond the southerly project limits of IH 94 running northeasterly, crossing IH 94 at Station 171EW+13 in a We Energies utility tunnel, and continues northeasterly, crossing USH 45 at Station 301NS+66 in a We Energies utility tunnel, to the 96th Street Substation in the

northeast quadrant of the Zoo Interchange, beyond the easterly project limits of USH 45. This line will remain in place without adjustment.

- An overhead electric line beginning from beyond the southerly project limits of S. 100th Street running northerly along the west fence of USH 45, crossing Schlinger Avenue at Station 526SCH+83, to a pole at Station 43+92, 25' RT. We Energies will abandon this line in the project limits during construction once all service disconnections have been terminated.
- An underground electric duct package beginning at the 96th Street Substation running southerly, crossing IH 94 at Station 200EW+94 in a We Energies utility tunnel, to Station 985AD+24, 7' LT where it turns and runs southwesterly along the southeast right-of-way of the Zoo Interchange, crossing Schlinger Avenue at Station 531SCH+58, where it turns and runs southerly along the east right-of-way of USH 45/IH 894 to beyond the southerly project limits. This line will remain in place without adjustment.
- An overhead electric line beginning from beyond the easterly project limits of USH 45 running westerly along the south side of the Hank Aaron State Trail to the east right-of-way of USH 45/IH 894 where it turns and runs southerly along the east right-of-way of USH 45/IH 894, crossing Schlinger Avenue at Station 531SCH+73, and continues to beyond the southerly project limits. This line will remain in place without adjustment.
- An underground electric line beginning at the We Energies utility tunnel at Station 985AD+24, 7' LT running easterly in Adler Street to a manhole in S. 84th Street at Station 36F+66, 30' RT. We Energies will abandon this line from Station 985AD+24, 7' LT to Station 1016AD+33, 3' RT and from Station 1022AD+40, 1' RT to the manhole at Station 36F+66, 30' RT prior to construction.
- An overhead electric line running east-west throughout the project limits, crossing S. 92nd Street at Station 61TJ+88. This line will remain in place without adjustment.
- An underground electric line beginning at a pole at Station 61TJ+88, 43' RT running westerly to a manhole at Station 61TJ+94, 11' LT where it turns and runs northerly, crossing IH 94 on the S. 92nd Street structure, to beyond the northerly project limits. We Energies will abandon this line from Station 63TJ+29, 9' LT to Station 67TJ+34, 11' LT prior to construction. The conduit attached to the structure is composed of transite material and it will be removed by We Energies in conjunction with the demolition of the structure. Allow We Energies 2 working days to perform removal of the transite conduits. Contact Amy Plato (414-385-6149 office / 414-335-7543 cell) of We Energies 21 days prior to the demolition of the structure to coordinate removal.
- An underground electric line beginning at a manhole at Station 67TJ+34, 11' LT running southerly in S. 92nd Street to Station 66TJ+79, 12' LT where it turns and runs easterly in Chester Street to a manhole at Station 52CH+06, 10' RT. From there it turns and runs northerly to a pole beyond the northerly project limits of Chester Street. We Energies will abandon this line in place prior to construction.
- An overhead pole line beginning from beyond the northerly project limits of Chester Street running southerly, crossing Chester Street at Station 48CH+20, to a pole at Station 48CH+20, 34' RT. We Energies will abandon this line within the project limits prior to construction.

- An underground electric line beginning at a manhole at Station 1019AD+46, 4’ RT running northeasterly to the north side of Adler Street where it turns and runs southeasterly along the north side of Adler Street to a pole at Station 1020AD+63, 28’ LT. This line will remain in place without adjustment.
- An underground electric duct package beginning from beyond the southerly project limits of S. 84th Street running northerly in the median of S. 84th Street, crossing under IH 94 at Station 237EW+85, to beyond the northerly project limits of S. 84th Street. Contact Amy Plato, (414) 385-6149 office / (414) 335-7543 cell, of We Energies - Electric 10 working days prior to the removal of the box culvert. We Energies - Electric will take an outage on this line during the duration of the box culvert removal and installation of the proposed storm sewer and will reconnect this electric line after the excavation area is backfilled. Allow We Energies - Electric 30 working days to reestablish their conduit, pull new cable, and splice over electrical feeds before overhead operations begin related to B-40-863 or B-40-864. Contact Amy Plato, (414) 385-6149 office / (414) 335-7543 cell, of We Energies - Electric 10 working days prior to the backfill of the excavation related to the box culvert removal and installation of the proposed storm sewer. The remaining portions of this line will remain in place without adjustment.
- An overhead electric line beginning from beyond the southerly project limits of S. 84th Street running northerly along the east side of S. 84th Street, crossing IH 94 at Station 283EW+11, to beyond the northerly project limits of S. 84th Street. Once We Energies - Electric has reestablished their conduit in S. 84th Street, allow We Energies - Electric 15 working days prior to overhead operations related to B-40-863 or B-40-864 to remove portions of the overhead line from Station 36F+85, 51’ RT to Station 44F+62, 46’ RT. The remaining portions of this line will remain in place without adjustment.
- An underground electric line beginning at a manhole at Station 38F+36, 7’ RT running westerly to a pole at Station 38F+58, 135’ LT where it rises to an overhead line and continues westerly to beyond the westerly project limits of Adler Street. We Energies will adjust this line at Station 38F+56, 68’ LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground electric line beginning at a pole at Station 261EW+99, 133’ RT running westerly to Station 260EW+54, 111’ LT. This line will remain in place without adjustment.
- An overhead electric line beginning beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 266EW+86, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An overhead electric line beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 276EW+95, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground electric line beginning from beyond the northerly project limits running southerly along the east side of S. 70th Street, crossing IH 94 at Station 286EW+42, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.

- An underground electric line beginning from beyond the northerly project limits running southerly along the east side of S. 70th Street, crossing IH 94 at Station 292EW+23, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.
- An underground electric line beginning from beyond the westerly project limits of USH 45 in the Milwaukee County Zoo running northeasterly to Station 491NW+08, 54' LT running northeasterly through the Milwaukee County Zoo along the west right-of-way of USH 45 to Station 496NW+62, 63' LT where it turns and runs northerly to Station 47XJ+53, 18' RT. From there it turns and runs northwesterly to beyond the westerly project limits of Bluemound Road. This line will remain in place without adjustment.
- An overhead electric line beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running northerly along the east fence of USH 45 to Station 198BL+41, 84' RT where it turns and runs easterly along the south side of Bluemound Road to Station 199BL+88, 63' RT. From there it turns and runs northeasterly, crossing Bluemound Road at Station 200BL+33, to Station 42TRN+19, 26' LT where it turns and runs easterly to beyond the easterly project limits. We Energies will abandon and remove this line from the 96th Street Substation to a pole at Station 42TRN+19, 26' LT prior to construction. We Energies will also reset a pole at Station 42TRN+19, 26' LT to Station 42TRN+21, 72' LT prior to construction.
- An overhead electric line beginning at a pole at Station 199BL+88, 63' RT running westerly along the south side of Bluemound Road, crossing USH 45 at Station 322NS+21, to a pole at Station 192BL+62, 52' RT where it turns and runs southerly to beyond the southerly project limits of Bluemound Road. We Energies will remove this line from Station 199BL+88, 63' RT to Station 192BL+62, 52' RT prior to construction.
- Two underground direct buried electric lines beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running northerly along the east fence of USH 45 to Station 198BL+30, 80' RT where it turns and runs easterly to Station 201BL+98, 62' RT. From there it turns and runs northerly along the west side of S. 95th Street to Station 51TRN+42, 0' LT where it turns and runs easterly to the east right-of-way of USH 45. From there it turns and runs northerly along the east right-of-way of USH 45 to beyond the northerly project limits of USH 45. We Energies will abandon this line in place from the 96th Street Substation to Station 51TRN+42, 0' LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An overhead electric line beginning from beyond the easterly project limits of S. 95th Street running westerly, crossing S. 95th Street at Station 48TRN+20 to a pole at Station 48TRN+20, 11' LT where it turns and runs northwesterly to a pole at Station 31WX+51, 43' RT. We Energies will abandon this line from Station 48TRN+16, 119' RT to Station 31WX+51, 43' RT prior to construction.
- An empty electric conduit on the Bluemound Road Structure in the westbound lanes crossing USH 45 at Station 323NS+21. The conduit attached to the structure is composed of transite material and it will be removed by We Energies in conjunction with the demolition of the structure. Allow We Energies 2 working days to perform removal of the transite conduits. Contact Amy Plato, (414) 385-

6149 office / (414) 335-7543 cell, of We Energies 21 days prior to the demolition of the structure to coordinate removal

- An empty electric conduit on the Wisconsin Avenue Structure in the westbound lanes crossing USH 45 at Station 734BA+69. The conduit attached to the structure is composed of transite material and it will be removed by We Energies in conjunction with the demolition of the structure. Allow We Energies 2 working days to perform removal of the transite conduits. Contact Amy Plato, (414) 385-6149 office / (414) 335-7543 cell, of We Energies 21 days prior to the demolition of the structure to coordinate removal.
- An overhead electric line beginning from beyond the southerly project limits of USH 45 running northerly along the west side of IH 894 / USH 45 to beyond the northerly project limits of the Berm near the Union Pacific Rail Road. We Energies will relocate this line in the project area prior to construction.

We Energies - Electric will relocate, construct and reconstruct electric facilities in the project area at the following locations prior to construction:

- A new overhead pole line crossing the Hank Aaron State Trail at Station 173HA+00.
- A new underground electric conduit beginning at the We Energies Utility tunnel at Station 985AD+31, 5' LT running easterly in the eastbound lanes of Adler Street to Station 1016AD+32, 2' RT.
- A new overhead electric line beginning from beyond the southerly project limits of S. 91st Street running northerly to a pole at Station 998AD+25, 34' RT where it turns and runs northwesterly, crossing IH 94 at Station 212EW+94, to beyond the northerly project limits of Chester Street.
- A new underground electric conduit beginning at a manhole at Station 1022AD+35, 3' RT running easterly in Adler Street to a manhole at Station 36F+65, 28' RT.
- Two new direct buried electric lines running in tandem approximately 10' apart beginning at 96th Street Substation running northerly along the east side of Milwaukee Montessori School to 95th Street and continues northerly along the west side of 95th Street to Station 202BL+24, 76' RT. From there they turn and run westerly to Station 201BL+53, 64' RT where they turn and run northerly, crossing Bluemound Road at Station 201BL+50 and Station 201BL+58, and continue northerly along the west side of 95th Street to Station 51TRN+44, 68' LT. From there they turn and run easterly to Station 51TRN+42, 0' LT.
- A new underground electric line beginning at 96th Street Substation and running northerly along the east right-of-way of USH 45 in private easement to the south side of Bluemound Road where it turns and runs easterly along the south side of Bluemound Road to Station 201BL+32, 88' RT. From there it turns and runs northerly, crossing Bluemound Road at Station 201BL+32, to Station 42TRN+21, 66' LT where it turns and runs easterly, crossing S. 95th Street to a new pole at Station 42TRN+21, 62' RT.

- An new overhead electric line beginning from beyond the southerly project limits of USH 45 running northerly along the west right-of-way of IH 894 / USH 45 to a pole at Station 228NS+23, 241’ LT where it turns and runs easterly to a pole at Station 228NS+31, 194’ LT.

We Energies - Electric also has abandoned electric lines within the project limits in the following locations:

- An underground electric line beginning beyond the southerly project limits of IH 94 running northeasterly, crossing the Hank Aaron State Trail at Station 131HA+56, to Station 142EW+42, 330’RT where it turns and runs southeasterly to Station 148EW+15, 357’RT. From there it turns and runs easterly to Station 154EW+07, 168’RT where it turns northeasterly to Station 154EW+34, 34’RT. From there it turns and runs easterly, crossing STH 100 at Station 569SN+93, to Station 156EW+16, 8’RT where it turns southeasterly to Station 159EW+96, 198’RT, crossing the Union Pacific Railroad, to Station 162EW+97, 173’RT. From there it turns and runs southeasterly to Station 164EW+47, 214’RT where it turns easterly to Station 169EW+89, 77’RT and then runs northeasterly, crossing IH 94 at Station 171EW+15, to beyond the northerly project limits of IH 94.
- An abandoned conduit beginning at the We Energies Adler Tunnel running westerly to Station 985AD+28, 6’ LT where it turns and runs southwesterly, crossing under the Hank Aaron State Trail at Station 182+00 and Schlinger Avenue at Station 530SCH+14 and Greenfield Avenue at Station 519G+22 to beyond the southerly project limits.
- An underground electric line beginning from beyond the southerly project limits of IH 94 running northerly to Station 752FB+72, 28’ RT where it turns and runs westerly to Station 747FB+82, 8’ RT.
- An underground electric line beginning from beyond the westerly project limits of USH 45 in the Milwaukee County Zoo running northeasterly to Station 492NW+54, 67’ LT where it turns and runs northerly to Station 315NS+50, 123’ LT. From there it turns and runs westerly to Station 43XJ+35, 22’ RT where it turns and runs northerly to Station 49XJ+41, 42’ RT. From there it turns and runs westerly to beyond the westerly project limits of Bluemound Road.

Contact Amy Plato, (414) 335-5585 office / (414) 335-7543 cell, of We Energies 7 days in advance to coordinate locations and any excavation near their facilities.

We Energies – Gas has underground gas facilities within the project limits in the following locations:

- An underground gas main beginning from beyond the westerly project limits of Schlinger Avenue running easterly on the south side of Schlinger Avenue to Station 526SCH+83, 31’ RT where it turns and runs northerly to Station 526SCH+83, 10’ RT. From there it turns and runs easterly in the eastbound lanes of Schlinger Avenue to beyond the easterly project limits of Schlinger Avenue. We Energies - Gas will abandon this line in place from Station 525SCH+75, 27’ RT to

Station 527SCH+17, 10’ RT. The remaining portions of this line will remain in place without adjustment.

- An underground gas main beginning from beyond the westerly project limits of Bluemound Road running easterly in the median of Bluemound Road, crossing USH 45 at Station 322NS+73 on the Bluemound Road structure over USH 45, and continues easterly to beyond the easterly project limits of Bluemound Road. We Energies - Gas will abandon this main in place from Station 191+02, 8’ RT to Station 206BL+54, 7’ RT prior to construction. The main on the bridge will be purged and abandoned in place prior to construction. Contact Amy Plato, (414) 335-5585 office / (414) 335-7543 cell, of We Energies - Gas 10 days prior to bridge demolition to confirm proper abandonment. Remove the pipe attached to the structure during demolition. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 191BL+88, 50’ LT running easterly along the north side of Bluemound Road to Station 194BL+96, 54’ LT where it turns and runs northerly along the west right-of-way of S. 97th Street to Station 25WX+05, 26’ RT. From there it turns and runs westerly along the south side of Wisconsin to beyond the westerly project limits of Wisconsin Avenue. We Energies - Gas will abandon portions of this main in place from Station 191BL+88, 50’ LT to Station 24WX+68, 28’ RT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 191BL+88, 8’ RT running northerly along the west side of S. 98th Street to Station 22WX+00, 30’ RT. We Energies - Gas will abandon portions of this main in place from Station 191BL+88, 8’ RT to Station 191BL+97, 190’ LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the westerly project limits of Wisconsin Avenue running easterly in the westbound lanes of Wisconsin Avenue to Station 28WX+58, 21’ LT, where it turns and runs northeasterly to Station 28WX+97, 60’ LT. From there it turns and runs easterly to Station 31WX+43, 60’ LT where it turns and runs southeasterly to Station 31WX+78, 18’ LT. From there it turns and runs easterly to beyond the easterly project limits of Wisconsin Avenue. We Energies - Gas will abandon this main in place from Station 21WX+93, 20’ LT to Station 35WX+12, 21’ LT prior to construction. The main on the bridge will be purged and abandoned in place prior to construction. Contact Amy Plato, (414) 335-5585 office / (414) 335-7543 cell, of We Energies - Gas 10 days prior to bridge demolition to confirm proper abandonment. Remove the pipe attached to the structure during demolition. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the westerly project limits of Wisconsin Avenue running easterly on the north side of Wisconsin Avenue to Station 25WX+75, 70’ LT, where it turns and runs southeasterly to Station 26WX+02, 49’ LT. From there it turns and runs easterly and ties into another gas main at Station 28WX+84, 47’ LT. We Energies-Gas will abandon this main in place from Station 22WX+26, 55’ LT to Station 28WX+84, 47’ LT prior to

construction. The remaining portions of this line will remain in place without adjustment.

- An underground gas main beginning from beyond the easterly project limits of Wisconsin Avenue running westerly on the north side of Wisconsin Avenue to Station 32WX+05, 54’ LT, where it turns and runs southwesterly and ties into another gas main at Station 31WX+76, 20’ LT. We Energies - Gas will abandon this main in place from Station 35WX+16, 51’ LT to Station 31WX+76, 20’ LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 203BL+40, 10’ RT running northerly, crossing Bluemound Road to Station 203+41, 54’ RT where it turns and runs westerly to Station 203BL+03, 54’ LT. From there it turns and runs northerly along the east side of S. 95th Street to Station 32WX+70, 34’ LT where it turns and runs easterly in the westbound lanes of Wisconsin Avenue to Station 33WX+82, 34’ LT. From there it turns and runs northeasterly to a gas regulation station at Station 34+23, 69’ LT. We Energies - Gas will abandon portions of this line in place from Station 203BL+40, 10’ RT to Station 42TRN+22, 55’ RT and from Station 48TRN+12, 61’ RT to the gas regulation station prior to construction. The remaining portions of this line and the gas regulation station will remain in place without adjustment.
- An underground gas main beginning at Station 203BL+03, 66’ LT running easterly along the north side of Bluemound Road to Station 207BL+82, 63’ LT. We Energies Gas will abandon this line in place prior to construction.
- An underground gas main beginning at Station 205BL+82, 9’ RT running northerly along the west side of S. 94th Street to beyond the northerly project limits of S. 94th Street. We Energies - Gas will abandon portions of this line in place from Station 205BL+82, 9’ RT to Station 206BL+08, 147’ LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the easterly project limits of Bluemound Road running westerly along the south side of Bluemound Road to Station 203BL+03, 63’ RT where it turns and runs southerly along the east side of S. 95th Street to beyond the southerly project limits. We Energies - Gas will abandon this line from Station 204BL+00 to Station 35TRS+88, 12’ RT prior to construction.
- An underground gas main beginning at Station 32WX+72, 33’ RT running easterly along the south side of Wisconsin Avenue to beyond the easterly project limits of Wisconsin Avenue. We Energies - Gas will abandon this line from Station 32WX+72, 33’ RT to Station 34WX+06, 32’ RT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 156EW+80, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground gas main beginning from beyond the southerly project limits running northerly in the southbound lanes of 92nd Street, crossing IH 94 at Station 21EW+42 on the S. 92nd Street Structure over IH 94, and continues northerly to beyond the northerly project limits of S. 92nd Street. We Energies - Gas will

abandon this line in place from Station 61TJ+81, 19' LT to Station 67TJ+51, 25' LT prior to construction. The main on the bridge will be purged and abandoned in place prior to construction. Contact Amy Plato, (414) 335-5585 office / (414) 335-7543 cell, of We Energies - Gas 10 days prior to bridge demolition to confirm proper abandonment. Remove the pipe attached to the structure during demolition. The remaining portions of this line will remain in place without adjustment.

- An underground gas main beginning at Station 45CH+04, 18' RT running easterly in the eastbound lanes of Chester Street to Station 50CH+41, 17' RT, where it turns and runs northerly to Station 50CH+42, 16' LT. From there it turns and runs easterly along the north side of Chester Street to Station 59CH+04, 20' RT. We Energies - Gas will abandon this entire line in place prior to construction.
- An underground gas main beginning from beyond the southerly project limits of Adler Street running northerly to Station 983AD+67, 17' LT where it turns and runs easterly along the south side of Adler Street to a gas main in S. 84th Street at Station 36F+37, 32' LT. We Energies - Gas will abandon this line in place throughout the project limits.
- An underground gas main beginning in Adler Street running southerly beyond the southerly project limits in the following streets: S. 94th Place, S. 94th Street, S. 93rd Street, S. 92nd Street, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street. We Energies - Gas will abandon these lines in place in all streets prior to construction.
- An underground gas main beginning from beyond the southerly project limits of S. 84th Street running northerly in the southbound lanes of S. 84th Street to beyond the northerly project limits of S. 84th Street. Contact Paul Osmanski, (414) 315-1278, of We Energies - Gas 10 working days prior to the demolition of the box culvert. We Energies - Gas will abandon portions of this line in place from Station 36F+37, 33' LT to Station 45F+23, 57' LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 43F+41, 26' LT running easterly along the north side of O'Connor Street to 76th Street. We Energies - Gas will abandon this line in place from Station 43F+41, 26' LT to Station 544CR+85, 25' LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 741FA+29, 11' LT running northerly along the east side of S. 83rd Street to beyond the northerly project limits. We Energies - Gas will abandon this line in place from Station 741FA+29, 11' LT to beyond the northerly project limits of S. 83rd Street.
- Two underground gas mains running north-south throughout the project limits, crossing IH 94 at Station 260EW+90 and Station 260EW+98. These lines will remain in place without adjustment.
- An underground gas main beginning from beyond the westerly project limits of W. Dixon Street running easterly in W. Dixon Street and continues easterly along the north right-of-way of O'Connor Street to S. 68th Street. This line will remain in place without adjustment.

- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly in the southbound lanes of S. 68th Street, crossing under IH 94 at Station 292EW+28, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

We Energies - Gas will relocate, construct and reconstruct underground gas facilities in the project area at the following locations prior to construction:

- A new underground gas line beginning at Station 525SCH+75, 28' RT running northerly to Station 525SCH+75, 1' RT where it turns and runs easterly in the median of Schlinger Avenue to Station 527SCH+17, 1' RT. From there it turns and runs southerly to Station 527SCH+17, 10' RT.
- A new underground gas line beginning in Bluemound Road at Station 191BL+00, 8' RT running northerly to Station 191BL+02, 46' LT where it turns and runs easterly to Station 191BL+68, 46' LT. From there it turns and runs northerly along the west side of S. 98th Street to Station 191+78, 193' LT where it turns and runs easterly to S. 97th Street at Station 39F+71, 56' LT. From there it turns and runs northerly along the west side of 97th Street to Station 48TF+00, 7' LT where it turns and runs easterly, crossing USH 45 at Station 332NS+56, to Station 48TRN+25, 62' RT. From there it turns and runs northerly along the east right-of-way of S. 95th Street to Station 49TRN+61, 62' RT where it turns and runs easterly along the south side of Wisconsin Avenue to Station 34WX+06, 38' RT. From there it turns and runs northerly, crossing Wisconsin Avenue, to a gas regulation station.
- A new underground gas line beginning at Station 190BL+96, 8' RT running southerly to Station 190BL+92, 62' RT where it turns and runs easterly to Station 192BL+56, 68' RT. From there it turns and runs southerly to beyond the southerly project limits of Bluemound Road.
- A new underground gas line beginning at Station 204BL+00, 63' RT running westerly along the south side of Bluemound Road to Station 203BL+12, 64' RT where it turns and runs southerly along the east right-of-way of S. 95th Street to Station 35TRS+88, 12' RT.
- A new underground gas line beginning at Station 42TRN+22, 55' RT running southerly along the east right-of-way of S. 95th Street to Station 203BL+00, 66' LT where it turns and runs easterly along the north right-of-way of Bluemound Road to Station 207BL+82, 67' LT.
- A new underground gas line beginning at Station 205BL+85, 76' LT running northerly to Station 206BL+07, 147' LT.
- A new underground gas line beginning in Wisconsin Avenue at Station 21WX+92, 22' LT running northerly to Station 21WX+92, 41' LT where it turns and runs easterly to Station 22WX+45, 41' LT. From there it turns and runs southerly to Station 22WX+45, 5' RT where it turns and runs easterly in the eastbound lanes of Wisconsin to Station 25WX+20, 5' RT. From there it turns and runs southerly to Station 48TF+16, 10' LT where it turns and runs easterly, crossing USH 45 at Station 332NS+68, to an alley east of 95th Street to Station 35WX+90, 170' RT. From there it turns and runs northerly along the west side of S. 94th Street to

Station 35WX+87, 35’ RT where it turns and runs westerly to Station 34WX+73, 35’ RT. From there it turns and runs northerly to Station 34WX+73, 64’ LT where it turns and runs northwesterly to a gas regulation station at Station 34WX+23, 69’ LT.

- A new underground gas line beginning from beyond the southerly project limits of Adler Street running northerly along the east side of Alder Street to Station 983AD+60, 21’ RT where it turns and runs easterly along the south side of Adler Street to S. 84th Street at Station 36F+31, 44’ LT.
- New underground gas line beginning in Adler Street running southerly beyond the southerly project limits in the following streets: S. 94th Place, S. 94th Street, S. 93rd Street, S. 92nd Street, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street.
- A new underground gas line beginning at Station 43CH+29, 19’ LT running easterly along the north right-of-way of Chester Street to Station 47CH+83, 28’ LT.
- A new underground gas line beginning at Station 68TJ+81, 48’ RT running southerly along the east right-of-way of S. 92nd Street to Station 50CH+48, 16’ LT where it turns and runs easterly along the north side of Chester Street to Station 53CH+51, 21’ LT.
- A new underground gas line beginning at Station 45F+25, 57’ LT running easterly, crossing S. 84th Street at Station 45F+25, to Station 45F+25, 52’ RT where it turns and runs southerly to Station 44F+65, 52’ RT. From there it turns and runs easterly S. 83rd Street at Station 741FA+03, 248’ LT where it turns and runs southerly to O’Connor Street at Station 741FA+44, 30’ LT. From there it turns and runs along the north side of O’Connor Street to Station 544CR+85, 48’ LT where it turns and runs southerly and ties into a main at Station 544CR+85, 24’ LT.

We Energies - Gas also has abandoned facilities within the project limits in the following locations:

- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 156EW+26, to beyond the northerly project limits of IH 94.
- An underground gas line beginning from beyond the southerly project limits of IH 94 running northerly to the Zoo Maintenance Tunnel at Station 171EW+46, 57’ RT. The line continues on the north side of the Zoo Maintenance Tunnel at Station 171+74, 105’ LT to beyond the northerly project limits.
- An underground gas main beginning from at Station 42TD+50 running northerly through the Zoo IC Core to approximately the SW Ramp.
- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 264EW+39, to beyond the northerly project limits of IH 94.
- An underground gas main beginning beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 265EW+41, to beyond the northerly project limits of IH 94.

Additionally, We Energies will remove abandoned gas main in conflict with proposed construction in locations where the gas main coating may contain hazardous material. The removal of such abandoned gas main will occur during construction. Contact Paul Osmanski, (414) 944-5796, of We Energies 10 days prior to any activity that will expose the existing gas main to coordinate removal activities.

Contact Amy Plato, (414) 335-5585 office / (414) 335-7543 cell, of We Energies 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Communications has an existing underground communications line beginning beyond the southerly project limits of S. 84th Street running northerly along the east side of S. 84th Street to WisDOT FTMS vault at Station 38F+19, 65' RT where it turns and runs westerly in a WisDOT FTMS conduit system. Abandon, remove, leave in place, and reconstruct the communication facilities as shown in the plans.

Contact Peter Daniels, (414) 302-8374 office, of City of West Allis - Communications 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Lighting has existing lighting facilities within the project limits in the following locations:

- Lighting facilities beginning from beyond the southerly project limits of S. 100th Street running northerly along the east side of S. 100th Street to a light pole at Station 778GD+10, 5' LT. Abandon, remove, leave in place, and reconstruct the lighting facilities as shown in the plans.
- Lighting facilities beginning from beyond the easterly project limits running westerly along both, the north and south side of Schlinger Avenue, to Station 526SCH+92 where they both cross Schlinger Avenue and connect into each other. Abandon, remove, leave in place, and reconstruct the lighting facilities as shown in the plans.
- Lighting facilities beginning from beyond the southerly project limits running northerly along the west side of S. Curtis Road, crossing under IH 94 at Station 111EW+81, to Station 111EW+86, 137'LT where it turns and runs easterly, crossing S. Curtis Road, to a pedestal at Station 113EW+22, 126'LT. These facilities will remain in place without adjustments.
- Lighting facilities beginning at a pedestal at Station 113EW+22, 126'LT and running southerly along the east side of S. Curtis Road, crossing under IH 94 at Station 112EW+66, to Station 113EW+00, 154' RT where it turns and runs easterly along the north side of W. Fairview Street to Station 127EW+31, 152' RT. From there it turns and runs southerly along the east side of W. Fairview Street to beyond the southerly project limits. These facilities will remain in place without adjustments.

Contact Peter Daniels, (414) 302-8374 office, of City of West Allis - Lighting 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Sewer has existing sanitary sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 767GD+39, 58' LT running northerly along the west side of S. 100th Street to a manhole at Station 773GD+65, 57' LT where it turns and runs easterly to a manhole at Station 773GD+64, 9' LT. From there it turns and runs northerlq1y along the east side of S. 100th Street to a manhole at Station 779GD+99, 1'RT. The City of West Allis will abandon this line from the manhole at Station 773GD+65, 57' LT to the manhole at Station 779GD+99, 1'RT prior to construction.
- An underground sanitary sewer beginning at a City of Wauwatosa sanitary manhole at Station 125EW+93, 152' RT running westerly along the south side of W. Fairview Avenue to a manhole at Station 117EW+38, 172' RT. This line will remain in place without adjustment.

The City of West Allis - Sewer will construct a new underground sanitary sewer line beginning at a manhole at Station 773GD+65, 34' LT running northerly in the median of S. 100th Street to a manhole at Station 779GD+24, 24' LT. The City of West Allis will construct this line prior to construction:

Contact Joe Burtch, (414) 302-8379 office, of City of West Allis – Sewer 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Water has existing underground water facilities within the project limits in the following locations:

- An underground water main beginning from beyond the southerly project limits running northerly in the southbound lanes of S. 100th Street, crossing Schlinger Avenue at Station 526SCH+34, and continues northerly to Station 41TD+96, 18' LT. This line will remain in place without adjustment.
- An underground water main beginning from beyond the westerly project limits of S. 100th Street running easterly along the south side of Schlinger Avenue to beyond the easterly project limits. This line will remain in place without adjustment.
- An underground water main beginning from beyond the southerly project limits running northerly along the west side of S. 116th Street to Station 127EW+06, 166'RT where it turns and runs westerly along the south side of W. Fairview Avenue to Station 121EW+53, 132' RT. This line will remain in place without adjustments.
- An underground water main beginning from beyond the southerly project limits running northerly along the east side of Curtis Road to Station 112EW+68 136' LT where it turns and runs westerly along the south side of W. Fairview Avenue to beyond the westerly project limits. This line will remain in place without adjustment.
- An underground water main beginning at Station 112EW+88, 195' RT running easterly along the south side of W. Fairview Avenue to Station 117EW+67, 190' RT. This line will remain in place without adjustment.

Contact Joe Burtch, (414) 302-8379 office, of City of West Allis - Water 7 days in advance to coordinate locations and any excavation near their facilities.

West Shore Pipeline has an underground gas pipeline beginning from beyond the southerly project limits of IH 94 running northeasterly to Station 101EW+64, 318' RT where it turns and runs northwesterly along the east side of Underwood Parkway South, crossing IH 94 at Station 101EW+42, to beyond the northerly project limits of IH 94. This facility will remain in place without adjustments. Contact Aric Aufdermauer, (414) 391-8102, of West Shore Pipeline 48 hours before any excavation or other construction activities within 25 feet of the described gas pipeline.

Contact Aric Aufdermauer, (414) 391-8102, of West Shore Pipeline 7 days in advance to coordinate locations and any excavation near their facilities.

Windstream has existing underground and overhead communications facilities within the project limits in the following locations:

- An overhead communications line on We Energies poles beginning beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 266EW+87, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground communications line in We Energies conduit beginning from beyond the southerly project limits running northerly along the east right-of-way of USH 45/ IH 894, crossing Schlinger Avenue at Station 531SCH+58 and the Hank Aaron State Trail at Station 181HA+66, and continues northerly around the east right-of-way of the SE Ramp to the We Energies Adler Tunnel along the north side of Adler Street. From there it goes into the Adler Tunnel, crossing IH 94 at Station 201EW+00, to Station 801FH+65, 77' LT and continues northerly to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

Windstream has an abandoned communication facility in an abandoned We Energies conduit at the We Energies Adler Tunnel running westerly to Station 985AD+28, 6' LT where it turns and runs southwesterly, crossing under the Hank Aaron State Trail at Station 182+00 and Schlinger Avenue at Station 530SCH+14 and Greenfield Avenue at Station 519G+22 to beyond the southerly project limits

Contact Jim Kostuch, (262) 792-7938 office, of WindStream 7 days in advance to coordinate locations and any excavation near their facilities.

WisDOT – Lighting has existing lighting facilities along IH 94, IH 894, USH 45 and along the interchange ramps throughout the project area. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact Eric Perea, (262) 574-5422 office / (414) 750-0935 cell, of WisDOT - Lighting 7 days in advance to coordinate locations and any excavation near their facilities.

WisDOT – Signals has existing signal facilities at the IH 94 on/off ramps at 84th Street, at the IH 94 on/off ramps at HWY 100, at Bluemound Road/ 95th Street intersection, and at Bluemound Road/ 97th Street intersection. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact WisDOT Traffic Signal Operations (414-750-2605) 7 days in advance to coordinate construction.

WisDOT STOC has existing communication facilities located throughout the project limits. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact Jeff Madson, (414) 225-3723, of WisDOT - STOC 7 days in advance to coordinate locations and any excavation near their facilities.

9. Other Contracts.

A Description

Coordinate your work in accordance to standard spec 105.5.

Modifications to the traffic control plan may be required by the engineer to be safe and consistent with adjacent work by others.

It is expected that routine maintenance by the city and county personnel may be required at certain times concurrently with the work being done under this contract.

The following contracts are anticipated to be under construction within the time period of this contract, unless otherwise indicated:

Contract ID 1060-33-72, Zoo IC - Watertown Plank Road Interchange reconstruction from Wisconsin Avenue to Underwood Parkway. The WisDOT contact is Jeff Bohen at (414) 750-2928; jeff.bohen@dot.wi.gov.

Contract ID 1060-33-75, Zoo IC - UPRR and STH 100 Bridge reconstruction over IH 94 and the Hank Aaron State Trail. The WisDOT contact is Joshua LeVeque at (414) 750-1468; joshua.leveque@dot.wi.gov.

Contract ID 1060-33-78, Zoo IC - S. 76th Street Bridge reconstruction over IH 94 from Kearney Street to O'Connor Street. The WisDOT contact is Jeff Bohen at (414) 750-2928; jeff.bohen@dot.wi.gov.

Contract ID 1060-33-81, Zoo Interchange Phase 2 reconstruction. The WisDOT contact is James Keegan at (414) 750-3311; james.keegan@dot.wi.gov.

Contract ID 1060-33-94, Zoo IC – Swan Boulevard and Discovery Parkway roundabout construction from USH 45 to Underwood Parkway. The WisDOT contact is Christopher Hager at (414) 750-1487; christopher.hager@dot.wi.gov.

Contract ID 1060-33-97, Zoo IC - Integrated Corridors 2 at various intersections in Milwaukee and Waukesha Counties. The WisDOT contact is Christopher Hager at (414) 750-1487; christopher.hager@dot.wi.gov.

Contract ID 1060-35-80, Zoo IC - Bluemound Road Water Main construction across USH 45 south of USH 18. The WisDOT contact is Jeff Bohen at (414) 750-2928; jeff.bohen@dot.wi.gov.

Contract ID 1060-35-91, Zoo IC – 2014 TMP Projects at various intersections in Milwaukee County. The WisDOT contact is Christopher Hager at (414) 750-1487; christopher.hager@dot.wi.gov.

Contract ID 1090-33-60, Rock Freeway resurfacing from the Hale Interchange to IH 43. The WisDOT contact is Ken Kiepczynski at (414) 659-3055; Kenneth.Kiepczynski@dot.wi.gov.

Contract ID 1100-20-60, USH 45 resurfacing from W. Burleigh Road to Good Hope Road. The WisDOT contact is Ken Kiepczynski at (414) 659-3055; Kenneth.Kiepczynski@dot.wi.gov.

Contract ID 2160-14-70, S. 76th Street resurfacing from W. Greenfield Avenue to W. Pierce Street. The WisDOT contact is Kathleen Kramer at (262) 548-8772; kathleen1.kramer@dot.wi.gov.

Contract ID 1120-11-86, IH 41 Conversion State Line to Green Bay, Russell Road - SCL Dodge County Signing, USH 41, SE Region under a department contract. Work under this contract is anticipated to be LET in either the 2014 or 2015 construction season. Work areas under contract 1120-11-86 fall within the physical limits of work under this contract. Coordinate activities in these areas with the 1120-11-86 contractor.

10. Railroad Insurance and Coordination – Canadian Pacific Railway.

A Description

Comply with standard spec 107.17 for all work affecting Soo Line Railroad Company, d/b/a Canadian Pacific Railway Company property.

Although this is the Hank Aaron State Trail (HAST) a Rails to Trails corridor with no existing tracks it still considered an active line with the Soo Line Railroad Company d/b/a Canadian Pacific Railway Company being the underlying property owner. As a result railroad insurance is still required.

A.1 Railroad Insurance Requirements

In addition to standard spec 107.26, provide railroad protective liability insurance coverage as specified in standard spec 107.17.3. Insurance is filed in the name of Soo Line Railroad Company, d/b/a Canadian Pacific Railway Company.

Notify evidence of the required coverage, and duration to Canadian Pacific Railway Company at 11306 Franklin Avenue, Franklin Park, IL 60131, Attention Edward Oom. Include the following information on the insurance document:

Project: 1060-33-80
Route Name: IH 94 and USH 45, Milwaukee County
West Allis Subdivision, I94 Milepost 92.60 and USH 45 MP 91.47
Hank Aaron State Trail (HAST)

A.2 Work by Railroad

The railroad will perform the work described in this section, except for work described in other special provisions and will be accomplished without cost to the contractor. None

A.3 Names and addresses of Railroad Representatives for Consultation and Coordination

Contact Edward Oom, Manager of Public Works- US East Engineering, 11306 Franklin Avenue, Franklin Park, IL 60131, TELEPHONE (630) 860-4975, FAX (630) 860-4170, Edward_Oom@cpr.ca, for consultation on railroad requirements during construction.

Amend standard spec 108.4 to include the railroad in the distribution of the initial bar chart, and monthly schedule updates. The bar chart shall specifically show work involving coordination with the railroad.

A.4 Temporary Grade Crossing

If a temporary grade crossing is desired, submit a written request to the railroad representative named in A.3 several weeks prior to the time needed. Approval is subject to the discretion of the railroad. The department has made no arrangements for a temporary grade crossing.

A.5 Train Operation

This is a Rails to Trails corridor so there is no train traffic.

11. Railroad Insurance and Coordination – Union Pacific Railroad.

A Description

Comply with standard spec 107.17 for all work affecting Union Pacific Railroad Company property and any existing tracks.

Replace paragraph (3) of standard spec 107.17.1 with the following:

Comply with the railroad's rules and regulations regarding operations on railroad right-of-way. If the railroad's chief engineering officer requires, arrange with the railroad to obtain the services of qualified railroad employees to protect railroad traffic through the work area. Bear the cost of these services and make payment directly to the railroad. Notify the appropriate railroad representative as listed in section A.3 above, in writing, at least 10 business days before starting work near a track. Provide the specific time planned to start the operations.

Note: Work that requires railroad flaggers to occupy the work zone for longer than the normal eight-hour day will require 40 day written notice to the railroad.

A.1 Railroad Insurance Requirements
In addition to standard spec 107.26, provide railroad protective liability insurance coverage as specified in standard spec 107.17.3. Insurance is filed in the name of Union Pacific Railroad Company.

Notify evidence of the required coverage, and duration to John Venice, Manager Special Projects – Industry and Public Projects Engineering Department at 101 North Wacker Drive – Suite 1920, Chicago, IL 60606, TELEPHONE (312) 777-2043, FAX (402) 233-2769, email jnvenice@up.com. Include the following information on the insurance document:

Project: 1060-33-80
Route Name: IH94, Milwaukee County
Crossing ID: 177 257B
Railroad Subdivision: Milwaukee Subdivision
Railroad Milepost: 90.03

A.2 Work by Railroad
The railroad will perform the work described in this section, except for work described in other special provisions and will be accomplished without cost to the contractor. None

A.3 Names and addresses of Railroad Representatives for Consultation and Coordination
Contact John Venice, Manager Special Projects – Industry and Public Projects Engineering Department, 101 North Wacker Drive – Suite 1920, Chicago, IL 60606, TELEPHONE (312) 777-2043, FAX (402) 233-2769, email jnvenice@up.com, for consultation on railroad requirements during construction.

Amend standard spec 108.4 to include the railroad in the distribution of the initial bar chart, and monthly schedule updates. The bar chart shall specifically show work involving coordination with the railroad.

A.4 Temporary Grade Crossing
If a temporary grade crossing is desired, submit a written request to the railroad representative named in A.3 several weeks prior to the time needed. Approval is subject to the discretion of the railroad. The department has made no arrangements for a temporary grade crossing.

A.5 Train Operation
Approximately 20-25 through freight trains operate daily through the construction site. Through freight trains operate at up to 30 mph.

12. Union Pacific Railroad Company Requirements.

A General

In addition to requirements and other articles within these special provisions, comply with the following requirements of Union Pacific Railroad Company (UPRR).

B Request for Information / Clarification

All requests for information (RFI) involving work within UPRR right-of-way shall be in accordance to the procedures listed elsewhere in the special provisions. All RFIs to UPRR shall be submitted by the contractors. Allow four weeks for UPRR's review.

C Plans / Specifications

Changes to the plans or specifications are subject to the approval of UPRR. All change requests to UPRR shall be by the contractor. Allow four weeks for UPRR review time.

D Construction Submittals

The contractor shall designate one individual as the one point of contact to the RR on all RR submittals. Contractor shall electronically submit all required construction submittals via email as pdf files along with any review comments to UPRR and copy the engineer. When submitting by email subject title shall be consistent for a specific submittal throughout the UPRR approval process.

I-94 under UPR Milwaukee Subdivision Milepost 90.03(_____)
HAST under UPRR Milwaukee Subdivision Milepost 89.95 (_____)
End subject title with type of submittal example (shoring plans).

All design submittals shall be stamped and signed by a professional engineer registered in the State of Wisconsin. A sufficient submittal review does not relieve the contractor of responsibility and liability.

The engineer and UPRR may review the submittals. If UPRR finds a submittal insufficient, make all required changes and resubmit it. A sufficient submittal review does not relieve the contractor of responsibility and liability of complying with the plans, specifications and the special provisions and for the structural integrity and proper functioning of the item that is the subject of the submittal. Allow four weeks for UPRR's review time of each submittal, including the original and any required resubmittals.

Item	Description of Submittal Item	Notes
1	Shoring Design and Details	
2	Falsework Design and Details	
3	Drainage Design Provisions	
4	Erection Diagrams and Sequence	
5	Demolition Diagram and Sequence	
6	Shop Drawings	Steel and concrete members.
7	Bearings	For all structures.
8	Concrete Mix Designs	For all structures.

Item	Description of Submittal Item	Notes
9	Waterproofing Material Certifications and Installation Procedure	Waterproofing and protective boards.
10	Structural Steel Certifications	All fracture critical members and other members requiring improved notch toughness.
11	Fabrication and Test Reports	All fracture critical members and other members requiring improved notch toughness.
12	Welding Procedures and Welder Certification	AWS Requirements.
13	Foundation Construction Reports	Pile driving, drilled shaft construction, bearing pressure test reports for spread footings.
14	Compaction Testing Reports for Backfill at Abutments	Must meet 95% maximum dry density, Modified Proctor ASTM D1557 backfill at abutments.
15	28 day Cylinder Test of Concrete Strength	

Whenever work may affect the operations or safety of trains, the method of doing such work shall first be submitted to UPRR's designated representative for review. Review by UPRR shall not relieve the contractor from liability.

E Infringement On Minimum Clearances

Contractor submit requests for infringement upon the minimum horizontal or vertical clearance requirements of standard spec 107.17.1 (3) 4. The contractor will submit the requests to UPRR's designated representative. Allow four weeks for UPRR's review time after receipt of a submittal from the engineer. Do not infringe upon the minimum clearances unless they are first approved in writing by UPRR.

F Approval of Details

Once approval is obtained by the UPRR, the contractor shall provide written approval to the engineer before undertaking such work. Allow four weeks for UPRR's review time of each submittal, including the original and any required resubmittals to obtain written approval.

G Site Inspections By UPRR

UPRR may make site inspections at any time. Provide the engineer a schedule of anticipated dates for the following activities; the engineer will furnish the schedule to UPRR:

Pre-construction conference
Shoring
Drilled shaft construction
Reinforcement and concrete placement for concrete work
Erection of superstructure
Placement of waterproofing
Completion of the bridge structure
Track section construction
Demolition

Update the schedule monthly, or more frequently if necessary, so that site visits may be scheduled.

H Construction Excavations and Demolition
Construction excavations shall meet OSHA and American Railway Engineering and Maintenance-of-Way Association (AREMA) requirements and the UPRR "Guidelines for Temporary Shoring" (GTS). The GTS is available for review from the Southeast Region's Railroad Coordinator at the department's Southeast Regional Office located at 141 NW Barstow Street, Waukesha, Wisconsin 53188.

13. Hauling Restrictions.

Supplement standard spec 107.2 with the following:

Approved local street haul routes are shown on the Local Road Haul Routes Overview Plan.

If additional haul routes are needed that are not shown on the Local Road Haul Routes Overview Plan, present a proposed haul route plan detailing any additional haul routes five business days in advance of any proposed hauling to the department. The additional haul route submittal shall include the months, days of the week, time of day, number of trucks, types of trucks and maximum loads of trucks anticipated to accomplish the project work.

The department will review the submittal and approve or provide a letter with comments and proposed revisions to the contractor within 5 business days of its receipt.

At all times, conduct operations in a manner that will cause a minimum of disruption to traffic on existing roadways.

14. Information to Bidders, U.S. Army Corps of Engineers Section 404 Permit.

The department has obtained a U.S. Army Corps of Engineers Section 404 permit. Comply with the requirements of the permit in addition to requirements of the special provisions. A copy of the permit is available from the regional office by contacting Karla Leithoff at (262) 548-6709.
107-054 (20080901)

15. Environmental Protection, Aquatic Exotic Species Control.

Exotic invasive organisms such as VHS, zebra mussels, purple loosestrife, and Eurasian water milfoil are becoming more prolific in Wisconsin and pose adverse effects to waters of the state. Wisconsin State Statutes 30.07, "Transportation of Aquatic Plants and Animals; Placement of Objects in Navigable Waters", details the state law that requires the removal of aquatic plants and zebra mussels each time equipment is put into state waters.

At construction sites that involve navigable water or wetlands, use the follow cleaning procedures to minimize the chance of exotic invasive species infestation. Use these procedures for all equipment that comes in contact with waters of the state and/or infested water or potentially infested water in other states.

Ensure that all equipment that has been in contact with waters of the state, or with infested or potentially infested waters, has been decontaminated for aquatic plant materials and zebra mussels prior to being used in other waters of the state. Before using equipment on this project, thoroughly disinfect all equipment that has come into contact with potentially infested waters. Use the following inspection and removal procedures (guidelines from the Wisconsin Department of Natural Resources http://dnr.wi.gov/topic/fishing/documents/vhs/disinfection_protocols.pdf for disinfection:

- Prior to leaving the contaminated site, wash machinery and ensure that the machinery is free of all soil and other substances that could possibly contain exotic invasive species;
- Drain all water from boats, trailers, bilges, live wells, coolers, bait buckets, engine compartments, and any other area where water may be trapped;
- Inspect boat hulls, propellers, trailers and other surfaces. Scrape off any attached mussels, remove any aquatic plant materials (fragments, stems, leaves, seeds, or roots), and dispose of removed mussels and plant materials in a garbage can prior to leaving the area or invested waters; and
- Disinfect your boat, equipment and gear by either:
- Washing with ~212º F water (steam clean), or
- Drying thoroughly for five days after cleaning with soap and water and/or high pressure water, or
- Disinfecting with either 200 ppm (0.5 oz per gallon or 1 Tablespoon per gallon) Chlorine for 10-minute contact time or 1:100 solution (38 grams per gallon) of Virkon Aquatic for 20- to 30-minute contact time. Note: Virkon is not registered to kill zebra mussel veligers nor invertebrates like spiny water flea. Therefore this disinfect should be used in conjunction with a hot water (>104º F) application.

Complete the inspection and removal procedure before equipment is brought to the project site and before the equipment leaves the project site.
107-055 (20130615)

16. Environmental Protection – Waste.

Conduct construction activities in an environmentally sound manner, including the proper disposal of all demolition material that cannot be recycled.

The excavation management plan for this project has been designed to minimize the off-site disposal of impacted material. Follow the requirements for the off-site management of solid waste (landfill) and reuse of solid waste soil (within the project limits) as indicated in these special provisions. If subsurface contamination or other signs of non-exempt (NR 500.08) solid waste including buried containers, industrial fill, stained soils, noxious odors, etc., are unexpectedly encountered elsewhere on the project during excavation, terminate excavation in the area and notify the engineer immediately. Work with the department's environmental consultant to properly manage the waste following the WisDOT-WDNR materials management options as indicated in the table below. Contact Michael Cape (WisDOT) at (262) 548-5930 or michael.cape@dot.wi.gov to arrange for environmental consultant coordination. The environmental consultant will perform waste characterization and coordinate with the WDNR for an appropriate handling and disposal plan on an emergency basis.

Management of Material Excavated During Highway Construction		
Classification	Characterization of Material	Material Management
1. Common Excavation (NR 500.08(2) Unregulated or Exempt Material)	Native soil Fill soils that have no obvious visual or olfactory contamination and may not have been analyzed for contaminants. Clean unpainted or untreated wood, brick, concrete, cured asphalt, and trace amounts of glass.	Contractor-selected sites approved through Erosion Control Implementation Plan (ECIP) review process, or on-site reuse
2. Special Excavation (NR 500.08(4) Solid Waste Low Hazard Exemption)	Soil with low levels of petroleum contamination or contaminant metals within the site fill plan criteria. Trace amounts (<25% volume of the excavation equipment's bucket load) of foundry sand, cinders, and fly ash.	WisDOT selected site or on-site reuse with WDNR concurrence. Sites must meet the location criteria of 504.04 (3) (c) and (4) (a) to (f). Fill plans are also approved through ECIP review process.
3. Contaminated Soil and Fill Material	Lead painted or treated wood Petroleum contaminated soil Significant amounts (>25% volume of the excavation equipment's bucket load) of foundry sand, cinders, or fly ash.	Contaminated material disposed at a WDNR-licensed solid waste disposal facility. Petroleum contaminated material shall be treated at a bioremediation facility (biopile) prior to disposal at the landfill. Direct disposal of contaminated material at landfills without such pre-treatment must be pre-authorized by the WisDOT.
4. Asbestos-containing Waste	Asbestos-containing material	Landfill at a WDNR–licensed solid waste landfill with approval to accept asbestos-containing material.
5. Hazardous Waste	RCRA Subtitle C (NR 600) contaminated media (hazardous waste)	Disposed or treatment under State's hazardous waste disposal contract with Veolia. Significant quantities should be evaluated for potential treatment to render non-hazardous to reduce disposal costs.
6. Potentially contaminated material	Potentially contaminated material with unusual visual, olfactory, or other characteristics	Temporary stockpile with appropriate environmental controls constructed per NR 718.05. Temporary stockpiling at solid waste landfill may be alternative with WDNR and Landfill's approvals.

17. Erosion Control.

Prepare and submit an erosion control implementation plan (ECIP) for the project including borrow sites, material disposal sites, and dewatering in accordance to Chapter TRANS 401 requirements. The ECIP will supplement information shown on the plans and not reproduce it. The ECIP will identify how to implement the project's erosion control plan.

Provide the ECIP 14 days prior to the pre-construction conference. Provide one copy of the ECIP to the department and 1 copy of the ECIP to the WDNR Liaison (Kristina Betzold, (414) 507-4946, Kristina.betzold@wisconsin.gov). Pursue operations in a timely and diligent manner, continuing all construction operations methodically from the initial removals and topsoil stripping operations through the subsequent grading, paving, and re-topsoiling to minimize the period of exposure to possible erosion. Do not implement the ECIP until it has been approved by the department.

Re-topsoil of graded areas, as designated by the engineer, immediately after grading is completed within those areas. Seed, fertilize, and mulch/erosion mat top-soiled areas, as designated by the engineer, within 5 days after placement of topsoil. If graded areas are left exposed for more than 14 days, seed those areas with temporary seed.

Use equipment having vacuum or water spray mechanism to eliminate the dispersion of dust when performing roadway cleaning operations. If vacuum equipment is employed, it shall have suitable self-contained particulate collectors to prevent discharge from the collection bin into the atmosphere.

Stockpile excess material or spoils on upland areas away from wetlands, floodplains and waterways. Stockpiled soil shall be protected against erosion. If stockpiled material is left for more than 14 days, seed the stockpile with temporary seed.

Do not pump water from the construction site to a storm water conveyance without the water first passing through a sediment trap.

Construct temporary sediment traps at locations that do not interfere with construction operations.

18. Public Convenience and Safety.

Revise standard spec 107.8(6) as follows:

Check for and comply with local ordinances governing the hours of operation of construction equipment. Do not operate motorized construction equipment from 9:00 PM until the following 7:00 AM, unless prior written approval is obtained from the engineer.

Residential areas	Do not exceed 5 dB(A) over preconstruction ambient noise levels
All other areas outside WisDOT right-of-way	Do not exceed 5 dB(A) over preconstruction ambient noise levels

Prior to waiving the noise compliance by the engineer, provide 48 hour advance notice to Mr. Jeff Polenske, Milwaukee City Engineer, at (414) 286-3701; Mr. William Wehrley, Wauwatosa City Engineer, at (414) 479-8929; or Mr. Peter Daniels, West Allis City Engineer, at (414) 302-8374 regarding the evening noise generating construction operations.
107-001 (20060512)

19. Notice to Contractor – Hank Aaron State Trail.

Between N. 121st Street and S. 94th Place, the Hank Aaron State Trail (HAST) is available to access work zones. The contractor does not have full rights to the HAST and will need to coordinate access with contractors performing department work as part of the projects listed in the Other Contracts article.

20. Notice to Contractor – Preserving Trees, Shrubs, and Planting Areas in the City of Milwaukee.

Replace standard spec 205.3.15 with the following:

A Description
This special provision applies to preserving trees, shrubs, and planting areas only located in the City of Milwaukee, which are NOT marked for removal.

B (Vacant)

C Construction
C.1 General
All cutting for the removal of sod and soil in order to establish a finished grade within 4 feet of existing trees must be done manually if necessary.

No construction equipment, cars, trucks, and/or materials shall be parked or stored on any median or tree border on this project or adjacent roadways.

Root foundations must remain adequate to withstand heavy windstorms.

Root systems of street trees may not be cut for the installation of any type of cable by the contractor or city department. Contact the forestry division at (414) 286-2428 for directional boring specifications.

The contractor will be responsible for excessive damage to the roots, trunks, and branches of all street trees. This responsibility may include the cost of any special treatment deemed necessary by the engineer to ensure survival of trees, or may include removal of trees at the contractor's cost.

Refrain from placing or storing any construction materials, sand, soil, or any other materials on the surface of the soil within the root zone of existing city street trees. Additionally, assure that no construction chemicals, tank rinsates, or petroleum products are deposited with the root zones of the trees. Root zone is defined as that area within the drip line of trees.

The contractor, prior to removal and/or replacement of sidewalk and/or curb and gutter, and driveways adjacent to all trees, shall review work operations with the engineer and/or Mr. Jim Kringer, forestry supervisor, at (414) 708-2428.

The following 52 trees are to be removed by the contractor:

988AD+08, RT	988AD+51, RT
988AD+90, RT	997AD+11, RT
999AD+06, RT	999AD+44, RT
999AD+83, RT	1000AD+64, RT
1003AD+47, RT	1004AD+07, RT
1004AD+48, RT	1005AD+21, RT
1008AD+42, RT	1009AD+31, RT
1010AD+57, RT	1010AD+99, RT
1011AD+86, RT	1012AD+29, RT
1012AD+72, RT	1015AD+12, RT
1015AD+67, RT	1017AD+66, RT
1018AD+96, RT	64TJ+11, LT
67TJ+34, LT	67TJ+98, LT
68TJ+43, LT	44CH+98, RT
45CH+27, RT	45CH+81, RT
46CH+22, RT	46CH+72, RT
47CH+29, RT	48CH+31, RT
48CH+76, RT	49CH+21, RT
730FD+71, LT	731FD+03, LT
736FD+13, RT	736FD+21, RT

43F+51, CL	738FA+38, LT
741FA+22, LT	741FA+37, LT
741FA+50, LT	741FA+85, LT
742FA+31, LT	742FA+40, LT
545CR+15, LT	545CR+63, LT
547CR+79, LT	583CR+36, LT

C.2 Sidewalk Construction
The root system on the walk side of the tree shall be cut not deeper than 9 inches below the finished grade of the new walks, and not more than 5 inches from the edge of the new walk. Roots in the walk area shall be removed only to a depth of 9 inches below finished grade of the new walk.

Sidewalks are to be removed, and roots cut, by use of hand implements only.

C.3 Carriage Walk Construction
When constructing or replacing carriage walks, roots shall not be cut by means of using mechanical root cutting machines. If root removal is essential to carriage walk replacement, roots shall be manually cut with hand implements. Roots shall be removed not deeper than 9 inches below the finished grade of the new carriage walk.

C.4 Curb, Gutter, and Road Construction
When constructing or replacing driveways or driveway approaches; roots shall not be cut by means of mechanical root cutting machines. If root removal is essential to driveway replacement, roots shall be manually cut with hand implements.

Cover exposed tree roots with mulch and water from a period immediately following curb and gutter removal, until the area is backfilled following construction. The cost of this work is incidental to removal items.

C.5 Damage and Repair
Caution should be used during the construction process to avoid damage to the roots, trunks, and branches of all street trees. Damage caused to any street tree or irrigation system will be repaired by the City of Milwaukee's Forestry Division and the costs of repair, rejuvenation, and/or value lost will be billed to the contractor or credited against the contract at the option of the city. If any of the irrigation system is damaged immediately contact Mr. Andrew Witczak at (414) 708-3795 or (414) 803-7392, andywitczak@yahoo.com for repair. Any and all questions regarding the irrigation system can be directed to Mr. Witczak.

At locations where the contractor has not complied with the forestry special requirements stated in the special provisions above, and the maximum clearance was exceeded or a thin form was not used, a minimum credit to the city of $50.00 per location will be taken. The

credit will increase in proportion to the excess distance beyond clearance allowed. The credit will be $50.00 for each 2-inch increment or part thereof in excess of the initial clearance allowed. Any damage to the tree's structure totaling 15 percent of the trees value will be billed on a prorata basis. If, in the opinion of the City of Milwaukee's Forestry Division, the tree has been damaged to the point that it warrants removal, the credit that will be taken will be equal to $100.00 per inch diameter of the tree. A field measurement will be taken to determine the tree size.

D (Vacant)

E Payment

The cost of this work shall be included under appropriate bid items for roadway and drainage excavation, sewer and water excavation, and removals. No separate payment will be made for preserving trees, shrubs, and planting areas located in the City of Milwaukee.

21. Notice to Contractor - City of Milwaukee Communications Conduit.

These plans include communications conduits for the City of Milwaukee. Provide as-built drawings to the City of Milwaukee including locations and depths for the conduit system, noting any field adjustments. Provide as-built drawings for both concrete-encased conduit and directional bore conduit.

For any questions on as-builts, contact Ms. Karen Rogney at (414) 286-3243.

22. Notice to Contractor - Milwaukee County Transit System.

The Milwaukee County Transit System (MCTS) maintains multiple bus routes throughout the project corridor along the project. Notify MCTS at least 14 days prior to beginning work. The MCTS contact is Mr. Dave Ziarek, (414) 343-1764.

Invite MCTS to all coordination meetings between the contractor, the department, local officials and business people to discuss the project schedule of operations including vehicular and pedestrian access during construction operations.

MCTS will remove their existing bus stop signs and shelters. Notify MCTS at least ten days in advance. MCTS will install new bus stop signs and shelters prior to the opening of traffic on the new roadway pavement. Notify MCTS at least 14 days prior to opening new pavement to vehicular traffic.

The contractor shall provide a safe boarding zone that is clear of debris and ADA compliant at each temporary bus stop. MCTS will install temporary bus stop signs if notified at least 14 days in advance.

23. Notice to Contractor – Milwaukee County Zoo.

At the Milwaukee County Zoo, a continuous eight-foot high perimeter fence must be kept intact at all times. Ensure temporary fencing is in place prior to removal of existing fence.

24. Notice to Contractor – Traffic Signal Equipment Lead Time.

Lead time for traffic signal equipment specified for this project has been ranging from 12-weeks to 18-weeks. Order equipment as soon as possible to assure the equipment is procured in a timely fashion and, therefore, installed, inspected, and ready for turn-on at the required date.

25. Notice to Contractor - Construction Staging Areas.

Construction Staging Areas will be made available for the contractor's use. The staging sites are located in the following areas:

- East of IH 894 between W. Lincoln Avenue and W. National Avenue
- Westbound Loop Ramp to Moorland Road (Northwest Quadrant)

Submit a site plan for Construction Staging Areas to the engineer for review. The department will either approve the site plan or request revisions.

Construction Staging Areas must be included as a selected site in the ECIP for this contract. During construction, the contractor is responsible for installing and maintaining proper erosion control devices at the staging areas. Protect storm sewer inlets from runoff. Install tracking pads for ingress and egress.

Maintain curb cutout access for emergency response vehicle access to each staging area at all times.

There are existing overhead and/or underground utility facilities located within the staging areas. At all times, maintain access for utility maintenance vehicles to each staging area and to all existing utility facilities therein. Identify and mark the existing utility facilities. Maintain a 20-foot horizontal clearance zone from all utility poles, towers, manholes, vaults or pedestals. Maintain vertical clearance from all energized utility lines in accordance to current OSHA and/or applicable code requirements. Conduct operations in such a manner as to prevent damage to existing utilities. Notify the utility owner promptly if damage occurs. Repair all damage caused to such utilities resulting from negligence or carelessness on the part of the contractor's operations at contractor expense.

Contact utility companies to coordinate any construction activities near their facilities and 7 days prior to any excavation in the area of their facilities. Contact Amy Plato, (414) 385-6149) of We Energies to coordinate construction activities in the area of gas or electric distribution facilities. Contact Brian Black, (262) 506-6907, of American Transmission Company to coordinate construction activities in the area of overhead electric transmission facilities.

If the site located east of IH 894 between W. Lincoln Avenue and W. National Avenue is used as a staging area, the contractor must install a screening fence west of S. 100th Street between W. Lincoln Avenue and W. National Avenue as shown in the plans and directed

by the engineer. Stockpiling dirt, crushing and batch plant operations are not permitted at the staging area located east of IH 894 between W. Lincoln Avenue and W. National Avenue.

Vacate the Construction Staging Areas by the completion date of this contract. Prior to final completion of work, restore staging areas to their preconstruction site grades and condition as directed by the engineer.

26. Notice to Contractor – Disposal of Treated Railroad Ties.

Treated wood is a regulated solid waste per NR 500 of the Wisconsin Administrative Code. Waste railroad ties generated by the project must be landfilled of at a licensed disposal facility. Costs associated with their handling and disposal are incidental to the project.

27. Notice to Contractor – Waste.

Use excess earthwork as shown in the plans and the earthwork table. In addition, the contractor is advised to contact the contractor for Contract ID 1060-33-94, Zoo IC – Swan Boulevard and Discovery Parkway roundabout project between USH 45 and Underwood parkway as a possible waste site. Construction of this adjacent project is anticipated between April and September of 2015. The WisDOT contact is Christopher Hager at (414) 750-1487; christopher.hager@dot.wi.gov.

28. Notice to Contractor – Airport Operating Restrictions.

Fill out the FAA Notice Criteria tool for any permanent structure (bridge, light pole, etc.) or equipment (crane, etc.) used during construction:

http://oeaaa.faa.gov/oeaaa/external/portal.jsp

If required by the Notice Criteria tool, and for any crane or construction equipment higher than 200 feet above the ground, submit completed form 7460-1 (Notice of Proposed Construction or Alteration) to The Federal Aviation Administration (FAA) at least 45 days before starting construction.
SEF Rev. 14_0421

29. Public Involvement Meetings.

Participate in department-sponsored public involvement meetings as the engineer requests. Ensure that representatives of subcontractors also participate in those meetings if the engineer requests.
SEF Rev. 14_0312

30. Traffic Meetings and Traffic Control Scheduling.

Every Wednesday by 9:00 AM, submit a detailed proposed 2-week look-ahead traffic closure schedule to the engineer. Type the detailed proposed 2-week look-ahead closure

schedule into an excel spreadsheet provided by the engineer. Enter information such as closure dates, duration, work causing the closure and detours to be used. Also enter information such as ongoing long-term closures, emergency contacts and general 2-month look-ahead closure information into the excel spreadsheet.

Meet with the engineer between 10:00 AM – 11:30 AM on Wednesdays at the Zoo Interchange project office on 2424 S. 102nd Street; West Allis to discuss and answer questions on the proposed schedule. Edit, delete and add closures to the detailed proposed 2-week look-ahead schedule, as directed by the engineer, so that proposed closures meet specification requirements. Other edits, deletions or additions unrelated to meeting specification requirements may also be agreed upon with the engineer during the 10:00 AM meeting.

Every Wednesday at 2:00 PM, or as scheduled by the engineer, attend a weekly traffic meeting. The meeting will bring local agencies, project stakeholders, owner managers, owner engineers, contractors, document control and construction engineering personnel together to discuss traffic staging, closures and general impacts. Upon obtaining feedback from the meeting attendees, edit, delete and add information to the detailed 2-week look-ahead closure schedule, as needed. Submit the revised 2-week look-ahead to the engineer.

Obtain approval from the engineer for any mid-week changes to the closure schedule. Revise the 2-week look-ahead as required and obtain engineer approval.

31. Material and Equipment Staging.

Submit a map showing all proposed material stockpile or equipment storage locations to the engineer 14 days prior to either preconstruction or proposed use, whichever comes first. Identify the specific purposes for the location. Obtain written permits from the property owner, and submit two copies to the engineer before use. Do not stockpile or store materials or equipment on wetlands.
SEF Rev. 13_0204

32. 3D Model Data.

The department will provide for Project 1060-33-80, for informational purposes only, detailed 3D proposed and existing model data or portions of data which includes: pavement, storm sewer, drainage, structures, signals, signs, FTMS, electrical, lighting, fencing, sanitary sewer and water main, and grading including proposed top, proposed base course, and proposed datum (subgrade) for automated machine guidance (AMG).. The department will provide the above data, or portions of the 3D model data, electronically consisting of electronic 2D/3D files containing features, points, reference lines, breaklines, area extents lines, profiles, LandXML v1.2 files and TIN Civil 3D surfaces in Autocad 2012 dwg files with horizontal datum - NAD-83 (GRS-1980) (2007), vertical datum - NAVD-1988 (2007), and coordinate projection - Wisconsin County Coordinate System in U.S. survey feet. The department will provide the composite model

data prior to project LET date as requested by the contractor by email to james.keegan@dot.wi.gov.

Upon Notice to Proceed, the department will also provide a composite model of stage 1 construction and will provide subsequent stage models as necessary.

The models will include at a minimum the requirements as described in the table below:

ELEMENT	FORMAT	LOA-CD	LOD-CD	TEMPORARY	BY STAGE
R/W and Environmental Areas					
R/W-Proposed	DGN/DWG	0.01’	2D	N/A	N/A
Easements-Proposed	DGN/DWG	0.01’	2D	N/A	N/A
Fences-Proposed	DGN/DWG	<0.06’	2D	2D	N/A
Wetlands-Located/Surveyed-Existing	DGN/DWG	<0.06’	2D	N/A	N/A
Non-roadway Surfaces					
Surfaces-Existing	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Grading/Non-roadway Surfaces-Proposed	DGN/DWG/XML	<0.06’	3D	3D	Yes
Cut/Fill Areas-Isopachs-Proposed	DGN/DWG	<0.06’	2D	N/A	N/A
Longitudinal Breaklines /Surface Points	DGN/DWG	<0.06’	3D	N/A	N/A
Slope Intercepts/Surface Limits	DGN/DWG	<0.06’	2D	N/A	N/A
Roadways/Roadway Features Surfaces-Proposed					
Roadway Pavement-Top Surfaces-Proposed	DGN/DWG/XML	<0.02’	3D	3D	Yes
Roadway Pavement-Base Cours Surfaces-Proposed	DGN/DWG/XML	<0.06’	3D	3D	Yes
Roadway Pavement-Subgrad Datum Surfaces-Proposed	DGN/DWG/XML	<0.06’	3D	3D	Yes
Roadway Curb and Gutter-Proposed	DGN/DWG/XML	<0.02’	3D	3D	Yes
Roadway Barrier-Proposed	DGN/DWG/XML	<0.06’	3D	3D	Yes
Roadway Pavement Marking-Existing	DGN/DWG	<0.10’	2D	N/A	N/A
Roadway Pavement Marking-Proposed	DGN/DWG	<0.10’	2D	2D	Yes
Roadway Stationing-Proposed	DGN/DWG	0.01’	2D	N/A	N/A
Roadway Alignments/Reference Lines-Proposed	DGN/DWG	0.01’	2D	N/A	N/A
Superelevation Transition Stations-Proposed	CSV	0.01’	N/A	N/A	N/A

Drainage-Storm Sewer - Proposed					
Inlets/MHs/Outfalls/Pipe/ Culverts/Ponds	DGN/DWG	<0.06’	3D	3D	Yes

Bridges-Proposed					
Stone Base	DGN/DWG/XML	<0.06’	3D	3D	Yes
Piles	DGN/DWG/XML	<0.06’	3D	3D	Yes
Footings	DGN/DWG/XML	<0.06’	3D	3D	Yes
Abutments	DGN/DWG/XML	<0.06’	3D	3D	Yes
Piers	DGN/DWG/XML	<0.02’	3D	3D	Yes
CI Beams	DGN/DWG/XML	<0.02’	3D	3D	Yes
Seats	DGN/DWG/XML	<0.02’	3D	3D	Yes
Deck Including Fillets	DGN/DWG/XML	<0.02’	3D	3D	Yes
Light Blisters	DGN/DWG/XML	<0.06’	3D	3D	Yes
Parapet Walls	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Retaining Walls-Proposed					
MSE-Proposed					
Straps	DGN/DWG/XML	<0.06’	3D	3D	Yes
Footings	DGN/DWG/XML	<0.06’	3D	3D	Yes
Top	DGN/DWG/XML	<0.06’	3D	3D	Yes
Coping	DGN/DWG/XML	<0.06’	3D	3D	Yes
Cast-in-Place-Proposed					
Stone	DGN/DWG/XML	<0.06’	3D	3D	Yes
Piles	DGN/DWG/XML	<0.06’	3D	3D	Yes
Top of Footings	DGN/DWG/XML	<0.06’	3D	3D	Yes
Face of Wall	DGN/DWG/XML	<0.06’	3D	3D	Yes
Coping	DGN/DWG/XML	<0.06’	3D	3D	Yes

Pile and Lagging-Proposed					
CI Piles at Top and Bottom	DGN/DWG/XML	<0.06’	3D	3D	Yes
Face of Wall/Face of Piles	DGN/DWG/XML	<0.06’	3D	3D	Yes
Bottom of Wall	DGN/DWG/XML	<0.06’	3D	3D	Yes
Top of Wall/Coping	DGN/DWG/XML	<0.06’	3D	3D	Yes
Face of Piles	DGN/DWG/XML	<0.06’	3D	3D	Yes
Top and Toe of Sheets	DGN/DWG/XML	<0.06’	3D	3D	Yes
Sign Bridges-Proposed					
Footings	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Piles	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Structure	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Other Structures-Proposed					
Noise Walls	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Screening Fences	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Tunnels-Utility	DGN/DWG/XML	<0.06’	3D	N/A	N/A
Special Foundations-Proposed					
Drilled Shafts	DGN/DWG/XML	<0.06’	3D	3D	Yes
Driven Piles	DGN/DWG/XML	<0.06’	3D	3D	Yes
Bored Piles	DGN/DWG/XML	<0.06’	3D	3D	Yes
Caissons	DGN/DWG/XML	<0.06’	3D	3D	Yes
Special Foundation Walls-Proposed					
Foundation Anchors	DGN/DWG/XML	<0.06’	3D	3D	Yes
Underpinning	DGN/DWG/XML	<0.06’	3D	3D	Yes
Pile Caps	DGN/DWG/XML	<0.06’	3D	3D	Yes
Grade Beams	DGN/DWG/XML	<0.06’	3D	3D	Yes
Tiebacks	DGN/DWG/XML	<0.06’	3D	3D	Yes

Lighting-Proposed					
Poles/Masts/Bases	DGN/DWG	<0.06’	3D	3D	Yes
Conduit/Cabinets/Pull Boxes	DGN/DWG	<0.06’	3D	3D	Yes
FTMS-Proposed					
DMS/CMS	DGN/DWG	<0.06’	2D	N/A	N/A
FTMS Fiber Optic lines	DGN/DWG	<0.06’	3D	N/A	N/A
FTMS Huts/Cabinets	DGN/DWG	<0.06’	2D	N/A	N/A
Signs-Proposed					
Signs-Type 1	DGN/DWG	<0.06’	2D	2D	Yes
Signs-Type 2	DGN/DWG	<0.06’	2D	2D	Yes
Traffic Signals-Proposed					
Poles/Heads/Bases	DGN/DWG	<0.06’	3D	3D	Yes
Conduit/Pull Boxes	DGN/DWG	<0.06’	3D	3D	Yes
Water Main Proposed					
Pipes	DGN/DWG	<0.06’	3D	N/A	N/A
Hydrants/Valves/Fittings/Stand pipes	DGN/DWG	<0.06’	3D	N/A	N/A
Sanitary Sewer-Proposed					
Pipes	DGN/DWG	<0.06’	3D	N/A	N/A
Manholes	DGN/DWG	<0.06’	3D	N/A	N/A

LOA (CD) = Level of Accuracy (LOA) – Contract Documents (CD) of the “Model Element” (such as 0.06’).

LOD (CD) = Level of Development (LOD) – Contract Documents (CD) of the “Model Element” (such as 2D, 3D, 4D, 5D, or XD).

The department is providing, by agreement with contractor and subcontractors, materials stored electronically. The parties recognize that data, plans, specifications, reports, documents, or other information recorded on or transmitted as electronic media (including but not necessarily limited to “CAD, CIM, BIM, GIS or other electronic documents”) are subject to undetectable alteration, either intentional or unintentional, due to, among other causes, transmission, conversion, media degradation, software error, or human alteration. Accordingly, all such documents are provided to the parties for informational purposes only and not as an end product or as a record document. Any reliance thereon is deemed to be unreasonable and unenforceable. The signed and stamped hard copy of the plans, specifications and estimates or other contract documents are the only true contract documents of record.

33. Available Documents.

The department will make all its information available to bidding contractors. The list of documents that are available for contractors’ information includes but is not limited to:

Design Study Report

Exceptions to Standards Report

Interstate Access Justification Report

Pavement Type Selection Report

Environmental Impact Statement

As-Built Drawings

Preconstruction survey

Traffic Management Plan

These documents are available from James Keegan at 141 NW Barstow Street, Waukesha, WI 53187, (414) 750-3311.

Reproduction costs will be applied to any copies requested.
SEF Rev. 13_1218

34. Geotechnical Investigation Information.

Replace standard spec 102.5(3) 2 with the following:

Available information relative to subsurface exploration, borings, soundings, water levels, elevations or profiles are available for review at the department's Regions office. Contact James Keegan, 141 NW Barstow Street, Waukesha, WI 53187, (414) 750-3311.

- Geotechnical Exploration and Bridge Foundation Evaluation Report, Bridges B-40-B-40-789, March 1, 2014;
- Geotechnical Exploration and Bridge Foundation Evaluation Report Bridge B-40-791 (northbound USH45 Mainline over I-94 E-W Mainline), March 1, 2014;
- Geotechnical Exploration and Bridge Foundation Evaluation Report, Bridges B-40-798, May 1, 2014;
- Temporary Bridge B-40-537 Geotechnical Foundation and Associated MSE Walls Memorandum, April 28, 2014;
- Temporary Bridge B-40-538 Geotechnical Foundation and Temporary MSE Walls Memorandum, April 28, 2014;
- Geotechnical Exploration and Foundation Evaluation Report Bridge B-40-849, February 17, 2014;
- Geotechnical Exploration and Foundation Evaluation Report Bridge B-40-852, January 31, 2014;
- Geotechnical Exploration and Foundation Evaluation Report Bridge B-40-855 (SW System Ramp), March 1, 2014;
- Geotechnical Exploration and Bridge Foundation Evaluation Report Bridge B-40-857 (Ramp NE Bridge over Ramp BC), February 28, 2014;
- Geotechnical Exploration and Bridge Foundation Evaluation Report Bridge B-40-862 (92nd Street over I-94), May 1, 2014;
- Geotechnical Exploration and Bridge Foundation Evaluation Report, Bridges B-40-863 and B-40-864, May 1, 2014;
- Geotechnical Exploration and Bridge Foundation Evaluation Report Bridge B-40-866, February 28, 2014;
- Geotechnical Exploration and Bridge Foundation Evaluation Report Bridge B-40-891 (Ramp SA over Zoo Maintenance Path), May 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Retaining Wall R-40-501 (Ramp SA – Off-ramp I-94 Westbound to STH 100), February 28, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, North to West USH 45 Retaining Walls (Structure ID No. R-40-504 and R-40-511), February 28, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report Retaining Wall R-40-514, April 30, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-522, Stage 1, March 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-523, March 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-524, Stage 3, March 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-525, Stage 2, May 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report Retaining Wall R-40-536, February 13, 2014;

- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-546 (I-94 between 90th Street and USH 45), May 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-548 (I-94 between 87th Street and USH 45), May 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-551 (East Leg I-94 West of 84th Street), May 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-552 (East Leg I-94 East of 84th Street), May 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report Retaining Walls R-40-554 and R-40-555 (Stage 2 Construction), April 30, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report West Approach Retaining Wall for Bluemound Road Over USH-45 (Structure ID R-40-556), April 23, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report East Approach Retaining Wall for Bluemound Road Over USH-45 (Structure ID R-40-557), January 13, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report Retaining Wall R-40-560, January 31, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-618 (252 S. 92nd Street), March 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report, Wall R-40-619 (S. 84th Street South of I-94), March 1, 2014;
- Geotechnical Exploration and Retaining Wall Evaluation Report Retaining Wall R-40-620 (330 S. 84th Street), March 1, 2014;
- Core 1 Contract Cantilever Truss and Butterfly Traffic Sign Foundation Geotechnical Memorandum, March 15, 2014;
- Core 1 Contract Traffic Sign Bridge Foundation Geotechnical Memorandum, April 25, 2014;
- Core 1 Contract Noise Barrier Geotechnical Data Memorandum, April 15, 2014;
- Geotechnical Data Report South Leg Storm Sewer – Manholes Z2822 to Z2431 (South Leg Tunnel), May 1, 2014;
- Geotechnical Baseline Report South Leg Storm Sewer – Manholes Z2822 to Z2431 (South Leg Tunnel), May 1, 2014.

Additional geotechnical information is available from studies and analyses that have been performed by Forward 45, LLC (F45) for the Wisconsin Department of Transportation (WisDOT) for other aspects of this project. Review the available information to determine if it is of use. The use or not of the geotechnical information does not relieve performing the work in accordance to the plans and specifications.
SEF Rev. 12_0813

35. Contract Award and Execution.

Supplement standard spec 103 as follows:

103.9 Bid Escrow Documentation

The department will require the lowest responsible bidder to submit documentation to be placed in escrow at a document storage facility. Bid Escrow Documentation (BED) consists of writings, working papers, computer printouts, charts, and data compilations that contain or reflect information, data, calculations or assumptions used by the bidder to determine the proposal submitted. If the apparent low bid is withdrawn or rejected, the second low bidder will provide the required documents as specified below within 72 hours of written notification by the department.

The BED shall clearly itemize the contractor's estimated costs of performing the scope of work defined in the contract.

The BED shall include, but not be limited to, all quantity takeoffs, rate schedules for the direct costs of craft labor, construction (expendable materials), construction equipment ownership costs, construction equipment operating costs, permanent materials subcontractors and insurance. Also include development of rates of production including, where appropriate: estimate of crews, construction materials, construction equipment, and construction sequence and duration. Submit the BED for each subcontractor whose total subcontract costs exceed $500,000.

Identify the allocation of construction plant and equipment, time and non-time related indirect costs (including if applicable joint venture fees), home office overhead, contingencies and margin applicable to each bid item. Further, documentation shall include consultant's reports, final estimate adjustment calculations, and all other information used by bidders to arrive at the estimate.

Any manuals standard to the industry used by the bidder in determining the proposal are also considered part of the BED. These manuals may be included in the proposal documentation by reference and shall show the name and date of the publication and the publisher.

It is not necessary to include documents provided by the department for the bidder's use in the preparation of the proposal.

The low bidder shall present authentic copies of their BED at the department's office, located at 2424 S. 102nd Street, West Allis, WI by August 29, 2014, at 10:00 AM.

At the time of submittal, only designated representatives of the apparent low bidder and the department will jointly examine the apparent low bidder's bid documentation to determine if it is authentic, legible, and generally meets the requirements of this special provision. The department will not share the BED information with, or in any other way divulge the contents of the apparent low bidder's BED to, their subcontractors or any other party.

The department, if requested by apparent low-bidder subcontractors, will also independently examine the BED submitted by the apparent low bidder's subcontractors in

the same manner as the apparent low bidder's BED was examined. Only designated representatives of the individual subcontractor and the department will be present during this examination. The department will not share the BED information with, or in any other way divulge the contents of a subcontractor's BED to, the apparent low bidder or any other party.

The department's examination of the BED will not include review of, nor will it constitute approval of, proposed construction methods, estimating assumptions, or interpretation of the contract. The examination will not alter any conditions or terms of the contract. The department will determine if the BED complies with this special provision within 4 hours after the time the BED is submitted. If the BED does not meet the requirements of this special provision, the department may reject the bid.

If the BED of the apparent low bidder meets the requirements of this special provision, the department and bidder will jointly deposit the BED at an agreed document storage facility. Place the BED in a sealed envelope or container clearly marked with the bidder’s name and address, date of submittal, project name and identification number. Representatives of the department and the bidder will deliver all bid escrow documentation and the original affidavit directly to a document storage facility, to be placed in escrow.

If the apparent low bid is withdrawn or rejected, the designated representative of the second low bidder and the department will examine and inventory the bid documentation of the second low bidder and their subcontractors in the manner specified above, then seal and deposit in escrow. If a subcontractor with a subcontract exceeding $500,000 is replaced, the contractor shall submit new BED for examination and escrow before the engineer will authorize the substitution.

The department will pay for the costs of the escrow document storage facility and will provide escrow instructions to the document facility consistent with this special provision.

The department acknowledges that the bidder considers that the BED constitutes trade secrets or proprietary information. This acknowledgment is based upon department’s understanding that the information contained in the BED is not known outside each bidder’s business, is known only to a limited extent and by a limited number of employees of bidder, is safeguarded while in bidder’s possession, and may be valuable to bidder’s construction strategies, assumptions and intended means, methods and techniques of design and construction. Except as set forth in the contract or as required by applicable Law, the department acknowledges that the BED will remain in the possession of the Escrow Agent at all times and will at no time be received by, or become the property of, the department.

Submit a copy of the affidavit below, signed under oath before a Notary Public by a representative of the bidder authorized to execute proposals. Department representatives will sign the affidavit after reviewing the BED.

The BED will remain in escrow until:

1. The bidder and the department mutually agree to release of the BED;

2. A court orders the department to provide the BED;

3. A dispute is referred to the Dispute Review Board or claims review panel; or

4. Either party seeks judicial review of a dispute.

If any of the events numbered 1-4 above occurs, the department will take possession of all relevant portions of the BED, as determined by the department, until complete resolution of the issue for which the request was made or the court order was issued. In absence of such actions, and provided the bidder signs an appropriate release, the unopened BED will be released to the bidder upon final acceptance and the expiration of all warranty periods provided by this contract.

BID ESCROW DOCUMENTATION CERTIFICATION

Using this BID ESCROW DOCUMENTATION CERTIFICATION, the bidder certifies that the material submitted below constitutes all the documentary information used in preparation of the bid and that said bidder has fully examined the contents of the container and that they are complete. The undersigned Wisconsin Department of Transportation representatives have reviewed the BED for compliance.

BIDDER

_____
(Name of Bidder)

By:_____
(Signature*)

Title: _____

Date: _____

WITNESS

_____
(Name of Witness)

By: _____
(Signature*)

Title:_____

Date:_____

WISCONSIN DOT

_____
(Name of Department Representative)

By:_____
(Signature*)

Title: _____

Date: _____

WISCONSIN DOT

_____
(Name of Department Representative)_

By: _____
(Signature*)

Title:_____

Date:_____

(END OF BID ESCROW DOCUMENTS)

103.10 Mobilization Workshops

103.10.1 Workshop Schedule

After contract award, attend the following workshops. Each workshop is described below and will include but not be limited to the following topics.

Workshop Schedule

1. Project Kickoff and Initial Work Plan
2. Cost Reduction Incentives
3. Utility Coordination
4. Submittals
5. CPM Scheduling
6. Leadership Partnering (Initial Session)
7 Secant and Tangent Pile Drilled Shaft Construction
8. Storm Sewer Tunneling
9. Work Force Opportunities
10. Notice to Proceed

The workshop dates will be scheduled after contract award.

If necessary, the engineer may modify the workshop schedule to ensure attendance by the necessary department and contractor personnel; however, all workshops will be completed prior to issuing the Notice to Proceed.

103.10.2 Workshops

103.10.2.1 Project Kickoff and Initial Work Plan

103.10.2.1.1 General

The Project Kickoff and Initial Work Plan Workshop will provide a forum to discuss and answer questions relative to the proposal, bid schedule, and other questions in the Project Questionnaire described in standard spec 103.10.2.1.2. The Initial Work Plan Workshop will include:

- Contractor responses to the attached Project Questionnaire.
- Department presentation of the use of CPM scheduling on the project and presentation of the department's Master Schedule to the contractor.
- Contractor presentation of its conceptual work plan for the project.
- Department and contractor discussion of the level of detail and features in the Initial Work Plan and the Baseline CPM Progress Schedule.

103.10.2.1.2 Project Questionnaire

Provide the following information in the order shown below. This information will constitute the "Project Questionnaire."

General Information
If a Joint Venture, provide information for each member of the Joint Venture.

1. Provide the following information about the company:
    - Firm Name
    - Address
    - Telephone and facsimile numbers; e-mail address
    - Contracting Specialties
    - Years performing work in contracting specialties
    - Geographic areas served
    - Total Management Employees and years of service
    - Project Managers
    - General Superintendents
    - Craft Superintendents
    - Engineers
    - Estimators
    - CPM Schedulers

Construction Engineering

- Provide/attach a copy of your Construction Project Manager's resume indicating the manager's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).
- Provide (if applicable) your third-party construction engineering firms.
- Provide plan for Construction surveying

Subcontractors

- Attach the list of all subcontractors that are intended for this Project and the items of work they shall perform.

Permanent Material Suppliers

- Attach the list of all permanent material suppliers that are intended for the project.

Quality Control (where applicable)

- Provide the name of your Construction Quality Control firm and qualifications indicating the firms' experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).
- Provide/attach a copy of your Construction Quality Control Manager's resume indicating the manager's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).
- List the major elements and/or Table of Contents of your Construction Quality Management Program.
- Provide the name of your Independent Quality Control Testing firm (Construction Quality Control Lab) and qualifications indicating the firm's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).

Organization Chart

- Provide a functional and personnel Organization Chart showing the authority and responsibilities of each individual identified.

Work Rules

- Provide the plan for hours per day, days per week, and number of shifts for key elements of work; i.e. sewer tunnels, retaining wall construction, roadway excavation, bridge structures, and roadway structural section activities.

Maintenance of Traffic

- Provide the name of your Traffic Control Manager and qualifications indicating the firm's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).
- Include an outline of your approach to the maintenance of traffic and how you shall stage the construction to meet the substantial completion schedule including planned locations for local street and freeway access into and out of the work zones for each stage of construction.
- Attach a copy of your Preliminary Schedule indicating your approach to achieving the substantial completion schedule.

Construction

- Provide the approach (type of equipment, number of crews, and where required ground support systems) for the following activities.
    1. Retaining wall construction by type of work
    2. Bridge demolition
    3. Roadway structural section
    4. Roadway excavation
    5. Office and yard facilities

103.10.2.2 Cost Reduction Incentives

The Cost Reduction workshop will identify value enhancing opportunities and consider modifications to the plans and specifications that will reduce either the total cost, time of construction or traffic congestion, without impairing, in any manner, the essential functions or characteristics of the project, including, but not limited to, service life, economy of operation, ease of maintenance, benefits to the traveling public, desired appearance, or design and safety standards.

Submit recommendations resulting from the workshop for approval by the engineer as cost reduction incentive proposals in conformance with the provisions in section 104.10 "Cost Reduction Incentive," of the standard specifications.

The department and the contractor may be able to complete the CRI Concept process, as specified in 104.10.2, during the CRI workshop.

Submit CRIs after the CRI workshop that were not introduced at the CRI workshop.

103.10.2.3 Utility Coordination

The Utility Coordination Workshop will define the scope and schedule of utility relocation work and the respective roles and responsibilities of the project team.

1. At a minimum, the following key personnel will attend the Utility Coordination Meeting.

    1.1 Department's Utility Coordinator.

    1.2 Contractor's Utility Coordinator.

    1.3 Designer Team's Utility Coordinator.

    1.4 Key Utility Company Representative(s)

2. At a minimum, the Utility Coordination Meeting will include a review of the following:

    2.1 Summary of all required utility relocations on the project.

    2.2 Special provisions addressing utility work.

    2.3 Sharing of contact information.

    2.4 Scheduling of work for utility relocation including critical milestones and staging for the work.

103.10.2.4 Submittals

The Submittal Workshop will identify the key required submittals for the project, categorize submittals into functional areas, and develop a schedule for submittals and submittal reviews. The Workshop participants will at a minimum:

1. Review the project special provisions.

2. Categorize submittals into functional areas including but not limited to:

    2.1 MSE Retaining Walls

    2.2 Temporary Shoring

    2.3 Falsework and Formwork

    2.4 Girder Shop Drawings

    2.5 Steel Transportation, Delivery and Erection

    2.6 Structure Demolition Plans

    2.7 Pile Hammers and High Capacity Piling

    2.8 Concrete/ Asphalt

    2.9 Materials

    2.10 ITS / Lighting

    2.11 Traffic Signals

    2.12 Sanitary Sewer and Water

    2.13 Permits

3. Develop a schedule for submittals.

103.10.2.5 CPM Schedule
See specification Baseline CPM Progress Schedule.

103.10.2.6 Leadership Partnering
The department will implement mandatory leadership partnering meetings on this contract.

Key members of the contractor project team, major subcontractors project team shall meet with department leadership on a bi-weekly basis. Attendance at this meeting shall include project level supervisory personnel, contractor/state level management personnel, and FHWA. Project design engineers, key project personnel of the contractor's principal

subcontractors and suppliers, local government representatives, environmental regulators, emergency service personnel, utility companies, impacted business and/or landowners, and other stakeholders may also be invited to attend, as needed.

This meeting will facilitate communication between parties and review issues and issues resolution procedures, help resolve disputes timely, satisfactorily, and as near as possible to the originating level of the dispute.

All mobilization workshop costs are incidental to the contract work.

103.10.2.7 Secant and Tangent Pile Drilled Shaft Construction

The Secant and Tangent Pile Drilled Shaft Construction workshop will serve as a pre-construction kickoff meeting specifically for the secant and tangent pile drilled shaft work and occur prior to any secant and tangent pile work being performed on the job, including the installation of the secant pile trial wall panel. The workshop must be attended by representatives of the prime contractor and key members of the prequalified drilling shaft subcontractor performing the secant and tangent pile installation. At minimum, key members of the drilling subcontractor includes on-site principal in charge, on-site construction supervisor and crew foremen.

The workshop agenda will include review and discussion of the drilling subcontractors submitted drilled shaft installation plan; scheduling and coordination of the secant and tangent pile drilled shaft installation work; mobilization and preparation; and subsequent work operations associated with the construction.

103.10.2.8 Storm Sewer Tunneling

The Storm Sewer Tunneling workshop will focus on the installation plan, access, material storage, scheduling, dewatering, shoring, maintaining existing drainage, erosion control, and subsequent work operations associated with the construction.

103.10.2.9 Work Force Opportunities

The Work Force Opportunities workshop will provide a venue for contractors to have meaningful dialogue with TrANS providers regarding the hiring of TrANS graduates. For the prime contractor and the nine largest subcontractors according to let value of work, provide staff with hiring authority to participate in a job-matching session during this workshop. The workshop will take place on the same day and in the same location as the pre-construction meeting. The workshop participants will at a minimum:

1. Review contractor hiring processes for general labor positions
2. Review and listen to presentation provided by TrANS providers regarding the training program including details regarding how contractors can hire TrANS graduates
3. Review TrANS graduate availability for working on project

4. Meet one-on-one for two minutes with each TrANS graduate in attendance at the meeting

103.10.2.10 Notice to Proceed
After all workshops are completed, the Notice to Proceed will be issued.
SEF Rev. 13_0626

36. Contractor Notification.

Replace standard spec 104.2.2.2(2) with the following:

If the contractor discovers the differing condition, provide a written notice, as specified in 104.3.3, of the specific differing condition before further disturbing the site and before further performing the affected work.

104.3.2 (Vacant)

104.3.3 Contractor Initial Written Notice
Replace standard spec 104.3.2 and standard spec 104.3.3 with the following:

If required by standard spec 104.2, or if the contractor believes that the department's action, the department's lack of action, or some other situation results in or necessitates a contract revision, promptly provide a written notice to the engineer. At a minimum, provide the following:

1. A written description of the nature of the issue.
2. The time and date of discovering the problem or issue.
3. If appropriate, the location of the issue.

Provide the additional information specified in standard spec 104.3.5 as early as possible to assist the engineer in the timely resolution of an identified issue. The engineer will not require, in subsequent submissions, duplication of information already provided.
SEF Rev. 12_0823

37. Municipality Acceptance of Sanitary Sewer and Water Main Construction.

Both the department and Cities of Milwaukee and Wauwatosa personnel will inspect construction of sanitary sewer and water main under this contract. Testing and final acceptance of the sanitary sewer and water main construction will be by the Cities of Milwaukee and Wauwatosa.

38. Contractor Document Submittals.

This special provision describes minimum requirements for submitting project documents to the department. This special provision does not apply to shop drawing submittals.

Provide one electronic copy of all documents requiring department review, acceptance, or approval. Attach a completed engineer-provided transmittal sheet to each email submittal. The department will reject submittals with incomplete transmittal sheets and require re-submittal.

The department will return one reviewed, accepted, or approved original to the contractor. Additional return originals can be requested. Submit an additional original for each additional return original requested.

Submit electronic copies in Adobe Acrobat (.pdf) format via email to an account the engineer determines. If possible, translate original documents from their native format (e.g. Word, Excel, AutoCAD, etc.) using an Adobe Acrobat translation routine. Scan other documents to Adobe Acrobat format with a minimum resolution of 600 dpi.

All costs for contractor document submittals are incidental to the contract.

39. Claims Process for Unresolved Changes.

Replace standard spec 105.13.5, 105.13.6, and 105.13.7 with the following:

105.13.5 Review by the Department

The department will conduct an initial review phase and a decision phase to resolve the claim. At any point in these two phases, the department may waive its review and request a dispute review board (DRB).

In the initial review phase, the contractor and the department will have up to 28 calendar days, from the contractor's submission of the claim, for the contractor to submit all additional information required and for the department to review the claim and conduct all meetings. The department may request, in writing, that the contractor submit additional information related to the claim. Submit that additional information, or notify the department in writing to base its decision on the information previously submitted. Either party may request a meeting to present their views. Before the meeting, the department will distribute written ground rules for the meeting to both parties.

Upon completion of the initial review phase, the department will notify the contractor in writing that it has begun the decision phase.

In the decision phase, the department will have up to 28 calendar days to render a written decision. The department will consider both parties' written and oral submissions and may consider other relevant information in the project records. The department will provide the following in its decision:

1. A concise description of the claim.
2. A clear, contractual basis for its decision that includes a reference to standard spec 104.2 on revisions to the contract and as appropriate, specific reference to language regarding the bid items in question.

3. Other facts the department relies on to support its decision.
4. A concise statement of the circumstances surrounding the claim and reasons for its decision. If the department rejects the claim in whole or in part, the department will explain why the claimed work is not a change to the contract work.
5. The amount of money or other relief, if any, the department will grant the contractor.

In the appeal phase, the contractor will have up to 28 calendar days from the date of the department's decision to request a dispute review board hearing. Submit a written request to the department within those 28 days or the department's decision is final. If the department does not render a decision within the 28 calendar days, the department will forward the claim to the DRB as if the department had rejected the contractor's claim.

105.13.6 Dispute Resolution

105.13.6.1 Definitions

Agreement	Formal Dispute Review Board Third-Party Agreement
Bureau	Bureau of Project Development
Contract	The construction contract between the prime contractor and Wisconsin Department of Transportation.
Contractor	Prime contractor
Department	Wisconsin Department of Transportation
Dispute	An issue, claim, change order request, or other controversy that remains unresolved following good faith negotiations between authorized representatives of the department and contractor.
Dispute Review Board (DRB)	One or three neutral individuals mutually selected by the department and contractor to review disputes and render findings and recommendations based on the contract.
Project Manager	Department construction project manager assigned to administer, oversee, and manage the project.
Standard Specifications	State of Wisconsin Standard Specifications for Highway and Structure Construction – Edition in effect with contract.
WTBA	Wisconsin Transportation Builders Association

105.13.6.2 Dispute Review Board (DRB)

The purpose of a DRB is to resolve claims in a manner that complies with the contract, is impartial, and expedites the standard claims process. The DRB will do so by issuing recommendations that may be binding or non-binding depending on the claim amount.

It must be emphasized and firmly understood that individual DRB members are not the "representative of" or "advocate for" the party which selected them. The entire DRB will function as an objective, impartial, and independent body at all times. In order to avoid any suggestion of partiality, there should be no individual communication in regard to the project between DRB members and employees of the contractor or department during the life of the DRB. The parties shall direct any matters needing the attention of the DRB to the chair of the DRB. The project manager or their designee will engage the DRB process.

105.13.6.3 Selection of Members and Agreement for Services
The department and the contractor will cooperatively establish the DRB promptly after contract execution.

105.13.6.3.1 General
A three member DRB shall be established

105.13.6.3.2 Experience
It is desirable that all DRB members be experienced with the construction process including design, construction, contract administration, contract law, and resolution of construction disputes.

It is not necessary that the DRB members be intimately familiar with the specific type of construction involved in the dispute. The DRB may consult technical and legal experts if the need arises under the terms of standard spec 105.13.6.4.7 Special Services described below.

All DRB members shall have attended the one-day DRB panel member workshop offered by the Dispute Review Board Foundation, or its substantial equivalent in other training, or shall be a qualified DRB panel member in another state which has training as a prerequisite to qualification for service on DRB panels.

105.13.6.3.3 Neutrality
It is imperative that the DRB members be neutral, act impartially, and be free of any conflict of interest. Individuals that fall into the following prohibitions below will not be further considered as a candidate for this contract DRB.

The term "member" also includes the member's current primary or full-time employer, and "involved" means having a contractual relationship with either the department or the contractor, such as a subcontractor, architect, engineer, or construction manager.

105.13.6.3.4 Prohibitions; Disqualifying Relationships for Prospective Members

1. An ownership interest in any entity involved in the construction contract, or a financial interest in the contract, except for payment for services on this DRB;
2. Previous employment by, or financial ties to, any party involved in the construction contract within a period of 6 months prior to award of the contract, except for fee-based consulting services on other projects;

3. A close professional or personal relationship with any key member of any entity involved in the construction contract which, in the judgment of either the department or the contractor, could suggest partiality; or
4. Prior involvement in the project of a nature that could compromise the prospective member's ability to participate impartially in the DRB's activities.

105.13.6.3.5 Prohibitions; Disqualifying Relationships for Members

1. Employment, including fee-based consulting services, by any entity involved in the construction contract.
2. Discussion concerning, or the making of, an agreement with any entity involved in the contract regarding employment after the contract is completed.

105.13.6.3.6 Disclosure Statement

As a part of the selection process, each prospective DRB member will be required to submit a complete disclosure statement for the approval of both the department and the contractor. Each statement shall include a resume of experience, together with a declaration describing all past, present, and anticipated or planned future relationships, including indirect relationships through the prospective member's primary or full-time employer, to this project and with the department or the contractor, or others involved in the contract, including subcontractors, suppliers, design professionals, and consultants. Disclosure of close professional or personal relationships with all key members of the department or the contractor or other parties involved in the construction contract shall be included.

105.13.6.3.7 Statewide Standing Roster

The department and WTBA have established a statewide standing roster of prequalified DRB members.

105.13.6.3.8 Selection Process

When establishing a 3-member DRB for a particular project or dispute, the department and the contractor will each select one DRB member. The two selected DRB members shall then jointly select a chair for the DRB. The disputing parties may mutually place restrictions on the chair selection. Any restriction agreed upon by the disputing parties will be communicated to the DRB members charged with selecting the chair.

After being selected, DRB member(s) must submit an updated disclosure statement to the department and contractor for review and approval. DRB members do not need to be on the Statewide Standing DRB Roster in order to be selected. However, if a DRB member (chair or non-chair) is selected from outside the standing roster, the proposed DRB member must meet all the aforementioned criteria and disclosure requirements and both disputing parties must approve the selection.

If a party disputes the qualification of a proposed DRB member (from the Statewide Standing DRB Roster or from outside the Roster), the disputing party shall identify what disqualifies the candidate. The department and the contractor shall then jointly determine whether the candidate will be accepted on the DRB. If the candidate is rejected, the party

responsible for the selection shall select another candidate and again seek approval from the other party(s).

105.13.6.3.9 Tenure of DRB
Once a DRB is engaged on a project, the DRB will be deemed established for any subsequent disputes that may require a DRB in accordance to standard spec 105.13.

The DRB will be dissolved as of the date of final payment to the contractor unless earlier terminated or dissolved by mutual agreement of the department and contractor.

105.13.6.3.10 Three-Party Agreement
After DRB member selections have been made, the DRB member(s) and authorized representatives of the department and the contractor shall execute the Formal Dispute Review Board Three-Party Agreement that sets forth the terms and conditions that apply to services provided by the DRB including procedures for standard operation of the DRB, use of the DRB in an advisory role, periodic site visits, and any other pertinent terms. The department, contractor, and all three DRB members will execute the DRB agreement within 14 calendar days after the selection of the chairperson.

105.13.6.4 Operation
In general, the DRB will operate in accordance to the guidelines established. However, it is not desirable to adopt hard and-fast rules for the functioning of the DRB. The entire procedure shall be kept flexible to adapt to changing situations. The DRB shall initiate, with the department's and contractor's concurrence, new procedures or modifications to existing procedures whenever this is deemed beneficial and appropriate.

The department and the contractor will cooperate to ensure that the DRB considers disputes promptly, taking into consideration the particular circumstances and the time required to prepare appropriate documentation.

Procedures and time periods may be modified by mutual agreement of the disputing parties.

105.13.6.4.1 Preparation of Claim File
The department will prepare a claim file within 14 calendar days of either the contractor or the department requesting a DRB hearing. The department will include all previous documents and evidence submitted during the department initial review and decision phases. The department may add additional documents but not additional analysis or conclusions. The claim file may contain, but is not limited to the following:

1. Contractor’s notices and statements.

2. Construction engineer’s written statements.

3. Engineer’s decisions.

4. Supplemental information from the contractor during the department claim review.

5. Project photos.

6. Meeting minutes, correspondence, and other documents related to the claim.

7. Complete set of plans and specifications.

8. Applicable shop drawings and submittals.

9. The department's decision.

10. Contractor request for a DRB hearing.

After the department has assembled the claim file, the department will provide a copy to the contractor. Provide any additional documentation to the claim file and return a complete copy of the claim file to the department within seven calendar days.

105.13.6.4.2 DRB Claim Review
The department will provide a copy of the completed claim file to each board member for review. If the DRB requests additional information, the appropriate party will provide the information to the DRB, but may not request reports, documents, or other information that are not normally generated by the department or the contractor in the course of construction of the project. The DRB may also visit the site to become familiar with the project and claim.

105.13.6.4.3 Scheduling Review
The project manager and DRB chair shall schedule the hearing. The DRB will set a date and location for a hearing no earlier than 30 calendar days but no later than 60 calendar days after the receipt of a written request for a DRB hearing.

After conferring with both the department and the contractor, the DRB Chairperson will establish a submittal schedule so that adequate time is allowed for the each party to address the other party's statements and supporting documentation before the presentation.

105.13.6.4.4 Pre-presentation Requirements
Concise written position statements shall be prepared by both the department and the contractor, with page number references to any supporting documentation. The position statement shall be submitted to each DRB member and to the other party. Submit one copy to each DRB member and 3 copies to the other disputing party at least 14 calendar days prior to the DRB hearing. Both parties will be allowed to amend or append information to their position statement up to 7 calendar days prior to the hearing. Any amendments or appendages shall be copied to the involved parties as prescribed for the position statement.

In large dollar amount disputes or disputes involving complex issues, the DRB may meet privately to review the information provided, discuss the procedures to be followed in hearing the dispute and the method of presentation to be followed. The DRB may also call a pre-meeting conference to discuss procedures with both the department and the contractor.

At least 7 calendar days before the date scheduled for a hearing, each party must submit to the DRB Members and to the other party a list of the persons who will attend and/or represent them at the hearing.

105.13.6.4.5 Presentation

Unless otherwise agreed by the DRB, the department, and the contractor, the presentation will be conducted at the nearest department region office. However, any location that would be more convenient and still provide all required facilities and access to necessary documentation is satisfactory.

The department and the contractor shall have representatives at all presentations. The DRB will establish which party will make its presentation first. The department and the contractor will be allowed successive rebuttals until all aspects are fully covered. The DRB members and the department and the contractor may ask questions, request clarification, or ask for additional data. All questions from the department or contractor shall be directed to the DRB; cross examination will not be allowed. In difficult or complex cases, additional presentations may be necessary in order to facilitate full consideration and understanding of all the evidence presented by both the department and the contractor. Both the department and the contractor shall be provided adequate opportunity to present their evidence, documentation, and testimony regarding all issues before the DRB.

Unless otherwise agreed by the department and the contractor, presentations will relate to issues of entitlement only. When the department and the contractor agree that the DRB will review or give guidance on issues of quantum as well as entitlement, both the department and the contractor will complete their presentations on entitlement before quantum is presented.

Normally, a formal transcript of the presentations will not be prepared. When requested by either the department or the contractor, the DRB may allow recordation and transcription by a court reporter with the cost to be allocated as agreed by the department and the contractor. Such transcript, when prepared, shall not constitute the official record of the DRB Review. The record prepared by the DRB shall be the official record of the DRB Review. The DRB may provide for audio or video recordings of the presentations for the use of the DRB only.

No participation by attorneys or legal counsel at the hearing will be permitted.

If either the department or the contractor fails to appear before the DRB on the date scheduled for the presentations, without justifiable cause, the party that was absent will be liable for any and all additional costs attributable to the cancellation of the hearing.

105.13.6.4.6 Deliberations

After the presentation is concluded, the DRB will confer to formulate its findings and recommendations. All DRB deliberations shall be conducted in private, with all individual views kept strictly confidential from disclosure to others.

105.13.6.4.7 Special Services

If at any time in the DRB process, the DRB believes that assistance from a technical expert or specialist is necessary or would facilitate resolution of the dispute, the DRB may request permission to retain such services. The DRB will provide to the department and contractor a written request detailing the following:

1. -Services desired;
2. -Benefit of services requested;
3. -Proposed service provider;
4. -Qualifications of proposed service provider; and
5. -Estimated fees for requested services.

The department and contractor must mutually agree to such assistance and approve the proposed service provider.

105.13.6.4.8 Claims by the Subcontractor

If the contractor's claim includes one or more subcontractor claims, the contractor shall ensure that an authorized representative with actual knowledge of the facts underlying the subcontractor claim assists in presenting the subcontractor's claim and answering questions raised by the DRB members or the department's representatives.

105.13.6.4.9 Findings and Recommendations

After all DRB hearings are concluded the DRB will formulate findings and recommendations. The DRB will conduct private and confidential deliberations and attempt to reach a unanimous decision. The DRB will base its findings and recommendations on the terms of the contract documents, established principles of law, statutes and regulations, the facts and circumstances of the claim, and the information provided by the parties.

Within 28 calendar days of the hearings the DRB will issue its final findings and recommendations. Claims resulting in a decision involving $250,000 or less will be binding on the parties to the extent permitted by Wisconsin law. For claims resulting in a decision involving more than $250,000, if accepted by the parties, the department will process the DRB decision for approval and will promptly process any required contract changes.

If the three-member DRB is unable to reach unanimity in its findings and recommendations, the DRB will so advise the department and the contractor in the report of the DRB. A dissenting member may, at his/her discretion, prepare a minority report to be included with the DRB report.

105.13.6.4.10 Further Action on Decisions Exceeding $250,000

Each party will have 45 calendar days from receipt of a final decision of the DRB exceeding $250,000 to accept or reject, in writing, the decision. If either party fails to accept or reject, in writing, that final decision of the DRB within 45 calendar days of receipt of such decision, the DRB will notify the parties that non-response is considered to be acceptance of that decision and further administrative or judicial review will be barred. Provide notice of acceptance or rejection of the final decision to the DRB in a manner and form prescribed by the DRB. The DRB will reject any notice on a final decision not filed by either party in a timely manner. This 45-day appeal period may be extended if agreed to in writing prior to the 45-day expiration period.

105.13.6.4.11 Advisory Dispute Review Board

As an alternative to the standard DRB process, the department may elect to use the DRB in an advisory role to expedite the resolution of a dispute or claim. The DRB may review and hear disputes or claim issues during a regularly scheduled site visit. The DRB will offer its advice either during or promptly after the site visit.

105.13.7 Payment for DRB

DRB members shall be compensated as prescribed in the Agreement.

The department and the contractor shall bear the costs and expenses of the DRB equally. Each DRB member shall be compensated and reimbursed expenses as prescribed in the Agreement executed by the department, contractor, and DRB member.

If the DRB desires special services such as legal, technical, or other expert assistance or testimony, or other consultation, accounting, data research, and the like, both the department and the contractor must agree to the special services. When both parties agree to special services, the procedures described in standard spec 105.13.6.4.7 Special Services of this document will be followed.

The department will provide, at no cost to the contractor, administrative services such as coordination of the DRB and state owned conference facilities. If other facilities and/or amenities are desired by both parties, these facility and amenity expenses shall be shared equally by both parties.

The following payment procedures will be used:

1. The DRB members shall submit invoices to the regional construction supervisor for review.
2. After the regional construction supervisor has reviewed and approved the invoices, the invoices will be forwarded to the project manager for review and approval.
3. After the project manager has reviewed and approved the invoices, the invoices will be forwarded to the contractor for review and approval.
4. If the contractor approves the invoices, the contractor shall make payment of all approved invoices.
5. The contractor shall provide the project manager documentation verifying payment.
6. The department will then execute a change order to pay the contractor one-half of the contractor paid invoice.

There will be no markups applied to expenses connected with the DRB, either by the DRB members or by the contractor when requesting payment of the department's share of DRB expenses. Regardless of the DRB recommendation, neither the department nor the contractor shall be entitled to reimbursement of DRB costs from the other party.

Department's payment to contractor for accepted work will be made as follows:

Pay Item Dispute Review Board
Pay Unit Dollar

These procedures and the Agreement contain all of the provisions for compensation and expenses of the DRB.
SEF Rev. 14_0401

40. Information to Bidders, Use of Recovered Material.

The department encourages the use of waste materials and recovered industrial byproducts as material substitutions (standard spec 106.2.1), provided they meet standard specification gradation requirements, conform to NR 538 requirements, and/or follow standard engineering practice for their intended use.
SEF Rev. 12_1212

41. ATR Control of Materials – ATR 40-0001.

Modify standard spec 106.2 – Supply Source and Quality with the following:

A portion of equipment to be installed by the contractor will be furnished by the department. This department-furnished equipment includes the following:

Department-furnished Items
Wavetronix HD 125 Unit
Wavetronix HD 125 Cable (40')
Wavetronix Click 200 Module
Wavetronix Click 202 Module
U-Bolt 5/8"x8"
YAGI Antenna and Cable
Cabinet Heater
Heater Thermostat

All other materials needed are the responsibility of the contractor.

Pick up all department-furnished equipment from the SE Region West Allis Service Facility at 935 S. 60th Street, West Allis, WI, 53214 at a mutually agreed upon time. Contact Mike Prebish at (414) 266-1170 to coordinate pick up of equipment. Transportation of the equipment between the West Allis Service Facility and the field or interim location(s) shall be the responsibility of the contractor.

42. Labor Compliance Reporting – Payroll Requirements.

Submit weekly certified payrolls verifying prevailing wage rates for all work performed under the contract as directed in the civil rights and labor compliance management system manual. Submit weekly certified payrolls within seven calendar days of the week covered by the weekly certified payroll.
SEF Rev. 12_1008

43. Dust Control Implementation Plan.

A Description
Develop, update, and implement a detailed Dust Control Implementation Plan (DCIP) for all land-disturbing construction activities and associated impacts both within the project site boundaries and outside the project site boundaries. Incorporate contract bid items that this article specifies into the DCIP.

B (Vacant)

C Construction
C.1 General
Take responsibility for dust control on the project as specified in standard spec 107.18. Minimize dust emissions resulting from land disturbing activities. Do not generate excessive air borne particulate matter (PM) or nuisance dust conditions. Take direct responsibility for controlling dust at all times throughout the duration of the contract, 24 hours per day, 7 days per week, including non-working hours, weekends, and holidays.

Submit a DCIP to the engineer for review at least 14 calendar days before the preconstruction conference. Coordinate with the department, if requested, to resolve DCIP related issues before the preconstruction conference. The department will either approve the DCIP or request revisions. Do not initiate any land-disturbing activities without the department's approval of the DCIP.

C.2 Dust Control Implementation Plan Contents

Develop a DCIP tailored to the specific needs of the project. Consider potential impacts to businesses and residences adjacent to the job site. Describe in detail all land disturbing, dust generating activities. Identify strategies to prevent, mitigate, and collect excess dust. Establish clear lines of communication with the engineer to ensure that all dust control issues can be dealt with promptly.

The DCIP shall include, but not be limited to, all of the following:

1. A single contact person with overall responsibility for the DCIP development as well as surveillance and remediation of job related dust. Include the following:
    - Name, firm, address, and working-hours phone number.
    - Non-working-hours phone number.
    - Email address.
2. Individual contact persons and their respective areas of responsibility. Include the following:
    - Name, firm, address, and working-hours phone number.
    - Non-working-hours phone number.
    - Email address.
3. A site map locating project features, the job site boundaries, all ingress and egress points, air intakes and other dust-sensitive areas, and all public and private paved surfaces within and immediately adjacent to the job site. Show where specific land disturbing, dust generating activities will occur and, to the extent possible, where employing various dust control or prevention strategies.
4. A matrix showing, for each anticipated land disturbing, dust generating activity, the following:
    - Preventive measures that shall be employed.
    - The applicable contact person.
    - The contractor’s timetable and/or surveillance measures used to determine when remediation is required.
    - The specific dust control and remediation measures that shall be employed. List the specific contract bid items that shall be used for payment. Also indicate costs that are incidental to the contract.
    - Both maintenance and cleanup schedules and procedures.
    - How excess and waste materials shall be disposed of.
5. A description of how off-site impacts shall be monitored and dealt with.

C.3 Updating the Dust Control Implementation Plan
Update the DCIP throughout the term of the contract as the engineer directs. Obtain the engineer's approval for all DCIP alterations. Also obtain the engineer's approval for DCIP routine adjustments for weather, job conditions, or emergencies that will have an impact on payment under the bid items listed in the approved DCIP.

C.4 Dust Control Deficiencies
Correct engineer identified dust control deficiencies within the time the engineer specifies. The engineer will allow from 30 minutes to 24 hours from the time the engineer notifies the contractor in writing of the deficiency. Deficiencies include, but are not limited to, actions or lack of actions resulting in excessive dust, failing to comply with the contractor's dust control implementation plan or associated special provisions, and failing to properly maintain equipment.

D Measurement
The department will measure the various bid items associated with dust control as specified in the applicable measurement subsections of either the standard specifications or other contract special provisions. The department will not measure work performed under a DCIP alteration unless the engineer specifically approves that alteration.

Measurement under the DCIP shall include, but is not limited to, the contract bid items listed below:

623.0200	Dust Control Surface Treatment
624.0100	Water
628.7560	Tracking Pads
SPV.0105.0002	Pavement Cleanup Project 1060-33-80

The department will measure work completed under other existing contract bid items if approved as a part of the DCIP. The department will consider new bid items to the contract if proposed under the DCIP. The department will not measure work required under the DCIP that is not included in contract bid items.

E Payment
All costs associated with the development and updating of the DCIP are incidental to the contract. The department will pay separately for the work required to implement the actions approved in the DCIP under the contract bid items approved as a part of the DCIP. All other costs associated with work approved under the DCIP are incidental to the contract.
SEF Rev. 12_1004

44. Project Site Air Quality.

Because fine particulate matter levels for Milwaukee, Racine and Kenosha Counties are typically close to $PM_{2.5}$ limits and the project is in a non-attainment area for the federal 8-hour ozone standard, contributions from construction activities can have a major impact well beyond the project limits. Take practical measures to mitigate the impact of operating construction equipment on the air quality in and around the project site.

Voluntarily establishing the staging zones for trucks waiting to load and unload is encouraged by the department. Locate staging zones where idling of diesel powered equipment will have minimal impact on abutting properties and the general public. The department will make signs available to help identify these zones. Have truckers queue up in these zones whenever it is practical. The department further encourages drivers to shut down diesel trucks as soon as it appears likely that they will be queued up for more than ten minutes. Notify employees and sub-contractors about fueling and engine idling.



Portable Concrete Crusher Plants
Portable concrete crusher plants may need a NR 440 Concrete Crusher Plant Air Permit for air emissions. Please contact Mike Griffin, Wisconsin Department of Natural Resources, Air Compliance Engineer (414) 263-8554 to request additional information and permit application materials. Complete permit applications may take three months to process.
SEF Rev. 12_1008

45. Maintaining Drainage.

Maintain drainage at and through worksite during construction in accordance to standard specs 107.22, 204, 205 and 520.

Use existing storm sewer, culvert pipes or existing drainage channels to maintain existing surface and pipe drainage. Pumps may be required to drain the surface and/or pipe/structure discharges during construction. Costs for furnishing, operating, and maintaining the pumps is considered incidental to storm sewer construction.

Dewatering
If dewatering or pumping is required, treat the water to remove suspended solids before allowing it to enter any waterway or wetland. Filter pumped water through a media such as washed stone or allow settling in a sedimentation basin with sufficient capacity and size to provide an efficient means to filter the water from the dewatering operation before it is discharged back into the waterway or wetland. As part of the Erosion Control Implementation Plan (ECIP) submittal, supply all pertinent information and calculations used to determine the best management practice for dewatering at each location it is required.

Refer to the dewatering guidelines of WisDNR Storm Water Management Technical Standards, Code #1061, "Dewatering". This document can be found at the WisDNR website: http://dnr.wi.gov/runoff/stormwater/techstds.htm.

46. Notice to Contractor – OCIP Exclusions.

The Owner Controlled Insurance Program (OCIP) insurance coverage excludes environmental/abatement work, including but not limited to hazardous materials/chemicals, lead and other materials considered hazardous – see Article – Owner Controlled Insurance Program for additional information. Environmental/abatement work must be performed by a qualified contractor and the work will not be covered under OCIP. The contractor performing Environmental/abatement work may potentially be enrolled in the OCIP if also performing other work not excluded from the OCIP umbrella. The qualified subcontractor must carry Construction Pollution Liability insurance with limits of at least $1,000,000 per Occurrence and $2,000,000 Aggregate.

Report only payroll from non-environmental work under the OCIP. Do not report payroll generated from environmental/abatement work.

Direct questions regarding this or any other aspects of OCIP to Kay Millonzi at (608) 267-7722, or kay.millonzi@dot.wi.gov.
SEF Rev. 14_0529

47. Owner Controlled Insurance Program.

Standard spec 107.26, "Standard Insurance Requirements" is deleted in its entirety and the following standard spec 107.26 is substituted thereof:

107.26 Standard Insurance Requirements

107.26(1)(a) Owner Controlled Insurance Program

1. Overview. The State of Wisconsin, Department of Transportation ("the WisDOT") has arranged with Aon Risk Solutions, (the "OCIP administrator") for this Project to be insured under its Owner Controlled Insurance Program ("OCIP"). The OCIP is more fully described in the Zoo Interchange manual for the Owner Controlled Insurance Program (the "Insurance Manual") and the Safety and Health Plan Manual that are

incorporated in this Special Provision and the Contract by this reference. Parties performing labor or services at the Project Site (as defined by the OCIP Policies) are eligible to enroll in the OCIP unless the party is an excluded party (as defined below). The OCIP will provide to enrolled parties(as defined below) workers' compensation and employer's liability insurance, commercial general liability insurance, Builders Risk and Excess Liability insurance as summarily described below in connection with the performance of the Work ("OCIP coverage's").

2. Enrolled Parties and Their Insurance Obligations. OCIP coverage applies only to Enrolled Parties. Enrolled Parties include the WisDOT and its employees, non-excluded Contractors and Subcontractors of all tiers who enroll in the OCIP, all employees of Enrolled Contractor's and Subcontractor's who perform Work at the Project Site, and such other persons or entities that the WisDOT, in its sole discretion, may designate (each such party who is insured under the OCIP is collectively referred to as an "Enrolled Party").

Enrolled Parties shall obtain and maintain, and shall require each of its Subcontractors to obtain and maintain, the insurance coverage specified in 107.26(1)(a) 8 below.

3. Excluded Parties and Their Insurance Obligations. OCIP coverage's do not apply to the following "Excluded Parties":

a. Hazardous materials remediation, removal and/or transport companies;

b. Vendors *, suppliers, fabricators, material dealers, truckers**, haulers, drivers and others who merely transport, pickup, deliver, or carry materials, personnel, parts or equipment or any other items or persons to or from the Project;

* WisDOT is requiring all vendors who perform maintenance on an enrolled contractor's equipment to be enrolled in the OCIP. Please see "WisDOT OCIP Enrollment Guidance Relating to Service Vendors" to determine whether they will be enrolled per project id number or on a Miscellaneous blanket basis.

** Truckers that come on site must remain in the cab of the vehicle.

Refer to the "Enrollment Matrix" which clearly outlines the requirements contingent upon the category that the entity falls under, such as: Contractor; Subcontractor; Consultant; Visitor; etc.

c. Sanitary disposal facility providers, if the only function is to drop off the units and pick them up later, they are material suppliers and are excluded. If the company also services/cleans the units on site, that is no longer being a material supplier. (Refer to "Enrollment Matrix", Vendors Providing Maintenance On Site).

d. Contractors and Subcontractors of any tier that do not perform any actual labor on the Project site;

e. Any party or entity not specifically identified in this special provision or excluded by the WisDOT as permitted by law, even if otherwise eligible.

f. If you are not employed by an Enrolled Party, but performing services of an Excluded Party, you are not covered by the OCIP.

Excluded Parties and parties not enrolled in the OCIP shall obtain and maintain, and shall require each of its excluded Subcontractors to obtain and maintain, the insurance coverage specified in standard spec 107.26(1)(a) 8 below and in the Insurance Manual. Excluded Parties shall comply with all of the safety requirements pursuant to 107.26(1)(a) 16.

4. OCIP Insurance Policies Establish OCIP coverage's. The OCIP coverage's and exclusions summarized in this special provision and the other contract documents are set forth in full in their respective insurance policy forms. The summary descriptions of the OCIP coverage's in this special provision or the Insurance Manual are not intended to be complete or to alter or amend any provision of the actual OCIP coverage's. In the event any provision of this special provision, the Insurance Manual, or the contract documents, conflicts with the OCIP insurance policies, the provisions of the actual OCIP insurance policies shall govern.

5. Summary of OCIP Coverage's. OCIP coverage's will apply only to those operations of each Enrolled Party performed at the Project Site (as defined in the OCIP insurance Policies) in connection with the Work and only to Enrolled Parties that are eligible for the OCIP.

The OCIP coverage's are primary insurance for all Enrolled Parties for occurrences during the policy period at the Project Site (as defined in the OCIP Policies). The OCIP will provide at least the following insurance to Enrolled Parties:

Summary of OCIP Coverages

This is a brief description of OCIP Insurance Coverage. Enrolled Parties should refer to the actual policies for details concerning coverage, exclusions and limitations.

a. Workers' Compensation Insurance -Statutory Limit including Jones Act and USL&H coverage, as applicable.

b. Employer's Liability Insurance $1,000,000 Bodily Injury by Accident, each accident $1,000,000 Bodily Injury by Disease, each employee $1,000,000 Bodily Injury by Disease, policy limits

c. Commercial General Liability (ISO Occurrence Form – Limits Shared By All Insureds) $2,000,000 Each Occurrence Limit (Annual Limit) $2,000,000 Personal/Advertising Injury Aggregate $4,000,000 General Aggregate Limit for all Enrolled Parties (Annual Limit)

$4,000,000 Products and Completed Operations Aggregate for all Enrolled Parties (Single Limit Applies to Entire Products and Completed Operations Extension)

10 yr. Products and Completed Operations Extension

d. The OCIP Commercial General Liability policy will not provide coverage for any claim that could be covered under a property policy or Builder's Risk policy.

e. Excess Liability insurance (over Employer's Liability and General Liability – Limits Shared by All Insureds)

$100,000,000 Each Occurrence Limit

$100,000,000 Aggregate (Annual Limit)

$100,000,000 Products and Completed Operations Aggregate Limit (Single Limit Applies to Entire Products and Completed Operations Extension).

f. Builder's Risk Insurance Coverage:

This is a brief description of Builder's Risk Insurance Coverage. Contractor should refer to the actual policies for details concerning coverage, exclusions and limitations. The Builder's Risk insurance covers insures property, including materials, supplies, machinery, fixtures and equipment which will become a permanent part of the Work (excluding road work at grade level) in the course of construction.

The Builder's Risk coverage insures WisDOT and Enrolled Parties.

Builders Risk:

Limit

Each Occurrence Limit
$100,000,000

*Builder's Risk Obligation**:***

- Contractor or Subcontractor shall pay to the WisDOT's designee within five (5) days
- Written notice a maximum of up to twenty-five thousand dollars ($25,000.00) for each loss payable under the Builder's Risk Policy attributable to Contractor's Work, acts or omissions, or the Work, acts or omissions of any of Contractor's Subcontractors, or any other entity or party for whom Contractor may be responsible ("builder's risk obligation").

6. The WisDOT's Insurance Obligations.

a. The WisDOT will pay the costs of premiums for the OCIP coverage's and WisDOT will receive or pay, as the case may be, all adjustments to such costs, whether by way of dividends, retroactive adjustments, return premiums, other moneys due, audits or otherwise.

b. The WisDOT assumes no obligation to provide insurance other than that specified in this special provision and the OCIP insurance policies.

c. Except as provided by applicable law, the WisDOT's furnishing of OCIP coverage's will in no way relieve or limit, or be construed to relieve or limit, Contractor or any of its Subcontractors of any responsibility, liability, or obligation imposed by the contract documents, the OCIP insurance policies, or by law, including without limitation any indemnification obligations which Contractor or any of its Subcontractors has to the WisDOT there under. The WisDOT reserves the right at its option, to furnish other insurance coverage of various types and limits provided that such coverage is not less than that specified in the contract documents.

7. Contractor's OCIP Obligations. Contractor shall:

a. Assign to WisDOT the right to receive all such adjustments, and shall require that each of its Subcontractors of every tier assigns to WisDOT the right to receive all such adjustments.

b. Incorporate the terms of this special provision in all subcontract agreements.

c. Enroll and maintain enrollment in the OCIP, and shall ensure that each non-Excluded subcontractor, enrolls and maintains enrollment in the OCIP. Enrollment shall take place within five days of a receipt of a Notice to Proceed, and prior to commencement of work. Comply with all of the administrative, safety, insurance, and other requirements outlined in this special provision, the Insurance Manual, the OCIP insurance policies, the Safety and Health Plan Manual, or elsewhere in the contract documents.

d. Provide each of its Subcontractors with a copy of the Insurance Manual and ensure Subcontractor compliance with the provisions of the OCIP insurance policies, the Insurance Manual, this special provision, and the contract documents. The failure of (a) the WisDOT to include the Insurance Manual in the bid documents or (b) Contractor to provide each of its eligible Subcontractors with a copy of same shall not relieve Contractor or any of its Subcontractors from any of the obligations contained therein.

e. Acknowledge, and require all of its Subcontractors to acknowledge in writing, that the WisDOT and the OCIP administrator are not agents, partners or guarantors of the insurance companies providing coverage under the OCIP (each such insurer, an "OCIP insurer") and that the WisDOT is not responsible for any claims or disputes between or among Contractor, its Subcontractors, and any OCIP insurer(s). Any type of insurance coverage or limits of liability in addition to the OCIP coverage's that Contractor or any

Subcontractor requires for its or their own protection, or that is required by applicable laws or regulations, shall be Contractor's or its Subcontractor's sole responsibility and expense and shall not be billed to the WisDOT.

f. Cooperate fully with the OCIP administrator and the OCIP insurers, as applicable, in its or their administration of the OCIP.

g. Provide, within five (5) business days of the WisDOT's or the OCIP administrator's request, all documents or information as requested of Contractor or its Subcontractors. Such information may include but not be limited to, payroll records, certified copies of insurance coverage's, declaration pages of coverage's, certificates of insurance, underwriting data, prior loss history information, insurance audits, safety records or history, OSHA citations, or such other data or information as the WisDOT, the OCIP administrator, or OCIP insurers may request in the administration of the OCIP, or as required by the Insurance Manual.

h. Pay to the WisDOT's designee within five (5) days of written notification, a sum of up to **$10,000** of each claim, including court costs, attorneys fees and costs of defense for property damage to the extent losses are insured under the OCIP Commercial General Liability policy for those losses that are attributable to Contractor's Work, acts or omissions, or the Work, acts or omissions of any of its Subcontractors, or any other entity or party for whom Contractor may be responsible ("contractor General Liability obligation"). The contractor General Liability obligation will not be insured by the OCIP Coverage's.

8. Additional Insurance Required From Enrolled Parties and Excluded Parties. Contractor shall obtain and maintain, and shall require each of its Subcontractors of every tier to obtain and maintain, the insurance coverage specified in this Section in a form and from insurance companies reasonably acceptable to the WisDOT. The insurance limits may be provided through a combination of primary and excess policies, including the umbrella form of policy. The insurance required by this Section shall conform to the WisDOT's requirements outlined in the Insurance Manual and be written by companies authorized to do business in the state of Wisconsin with an **AM Best rating of A-or better**. Contractor shall provide certificates of insurance coverage to the WisDOT as required below and by the Insurance Manual.

As to Enrolled Parties, the Workers' Compensation, Employer's Liability, and Commercial General Liability insurance required by this section shall only be for operations away from the Project Site (as defined by OCIP Policies). The cost of providing the required insurance coverage and limits is incidental to the contract. The department will make no additional or special payment for providing insurance.

TYPE OF INSURANCE MINIMUM LIMITS REQUIRED

1. Commercial General Liability insurance shall be endorsed to include Blanket Contractual Liability coverage.

a. $2,000,000 Combined Single Limits per occurrence with an annual aggregate limit of not less than $4,000,000.

b. The OCIP Coverage's shall exclude blasting or explosion operations. If blasting or explosion operations are used in connection with the Work, Commercial General Liability insurance shall not contain an exclusion for blasting or explosion and shall be provided in limits established by the WisDOT at the time such blasting or explosion methods are elected. Such coverage shall apply to operations whether the operations occur on the Project site or away from the Project site.

c. Wisconsin Department of Transportation, their respective officers, agents and employees, and any additional entities as the WisDOT may request as additional insureds must be named as an Additional Insured which shall include: i) liability arising out of the Work performed by the named insured; ii) liability arising out of the supervision of the Work performed by or operations of the named insured; and iii) liability of the acts or omissions of the Additional Insureds relating to Work performed by the named insured for the Project, except for sole negligence of the Additional Insureds iv) will state that coverage is afforded on a primary and non-contributory basis.

d. Ongoing Construction Operation(s) in effect at all times while work is being performed by Contractor;

e. Subcontractors and Independent Contractors (if any);

f. Products and Completed Operations, including coverage applicable to additional insureds (as required by this agreement) with Completed Operations coverage to remain in force, whether by endorsement or renewal of coverage, including the Contractor, any party required to be indemnified by this Contract and any other party required by this Contract to be named as an additional insured, for at least two (2) years from the date of final completion of the Project and WisDOT's acceptance of the work; and

g. Explosion, collapse, and underground hazards.

h. Contractual Liability (insured contract) coverage sufficient to meet the requirements of this Contract (including defense costs and attorney's fees assumed under contract);

i. Personal and Advertising Injury Liability coverage (with the standard contractual and employee exclusions deleted);

j. Notice and Knowledge of Occurrence conditions limited to the knowledge of relevant corporate officers or risk managers with an Unintentional Errors and Omissions provision (providing that the insurer may not deny coverage unless it can show that it has been prejudiced by a failure of the insured to comply with a condition of the policy); and

k. CG 22 79 07 98 (or equivalent) is the only acceptable Professional Liability Exclusion.

l. Operations performed within 50' of railroad

m. Contractors must provide their own insurance for owned, leased, rented and borrowed equipment, whether such equipment is located at a Project Site or "in

transit". Contractors are solely responsible for any loss or damage to their personal property including, without limitation, property or materials created or provided under the Contract until installed at the Project Site, Contractor tools and equipment, scaffolding and temporary structures.

2. Workers' Compensation and Employer's Liability insurance.

   a. Workers' Compensation Limits: Statutory Limits

   b. Employer's Liability limits:

      $1,000,000 Bodily Injury by Accident, each accident $1,000,000 Bodily Injury by Disease, each employee $1,000,000 Bodily Injury by Disease, policy limits

      Terms and conditions shall include:

      - USL&H – where applicable.
      - Jones Act – where applicable.
      - All states endorsement -where applicable.

3. Commercial Automobile Liability insurance as specified by Insurance Services Office (ISO), form CA 00 01, symbol 1 (any auto) with the following limits and endorsements:

   a. No Trucking or Hauling: $1,000,000 Each Accident

   b. Trucking or Hauling (Non Hazardous Materials): $2,000,000 Each Accident

   c. Trucking or Hauling Hazardous Materials: $5,000,000 Each Accident with an MCS 90 Endorsement and ISO Endorsement CA 99 48.

4. For any work over water, whether deemed navigable or otherwise, Contractors Pollution Liability insurance with $2,000,000 per occurrence and $2,000,000 aggregate policy limits.

5. Aviation and/or Watercraft Liability insurance, as appropriate, including hull and protection and indemnity for watercraft, or other insurance, in form and with limits of liability and from an insuring entity reasonably satisfactory to the WisDOT.

Contractor's failure to procure or maintain the insurance required by this Section and to assure all its Subcontractors of every tier maintain the required insurance during the entire term of the contract shall constitute a material breach of this contract under which the WisDOT may immediately suspend or terminate this contract or, at its discretion, procure or renew such insurance to protect the WisDOT's interests and pay any and all premiums in connection therewith, and withhold or recover all monies so paid from the Contractor.

Contractor shall provide the WisDOT with certificates of insurance as evidence that required coverage's for insurance detailed in this section are in force. The bidder shall provide certificates of insurance in their pre-qualification statement as specified in 102.1.

Contractor shall notify the WisDOT at least 60 calendar days before a cancellation or material change in coverage and only obtain coverage from insurance companies licensed to do business in the state that have an AM Best rating of A- or better. The cost of providing the required insurance coverage and limits is incidental to the contract. The WisDOT will make no additional or special payment for providing insurance.

The above insurance requirements shall apply with equal force whether the Contractor or a Subcontractor, or anyone directly or indirectly employed by either, performs the work under the Project.

9. Additional Insureds:

All insurance required by this agreement (excluding only workers compensation insurance) shall name WisDOT, all parties required to be indemnified by this Contract and all other parties as reasonably requested by the WisDOT, as additional insureds. All policies (including primary, excess and/or umbrella) must provide that coverage shall be primary and non-contributory to any insurance maintained by the Contractor or the additional insured, all of which shall be stated on the Certificate of Insurance provided by the Contractor. The Additional Insured Endorsement shall be on Form CG 20 10 11/85, or CG 20 33 10/01 plus CG 20 37 10/01, or equivalent, and shall include ongoing and completed operations coverage, which shall not contain any restrictions**.**

IN THE EVENT THAT THE LAW OF THE STATE IN WHICH THE PROJECT IS LOCATED (OR APPLICABLE LAW) LIMITS THE ADDITIONAL INSURED COVERAGE THAT WISDOT MAY REQUIRE FROM THE CONTRACTOR, THEN THE CONTRACTOR SHALL BE REQUIRED TO OBTAIN ADDITIONAL INSURED COVERAGE TO THE FULLEST EXTENT OF COVERAGE AND LIMITS ALLOWED BY APPLICABLE LAW AND THIS CONTRACT SHALL BE READ TO CONFORM TO SUCH LAW.

10. Contractor Representations and Warranties to the WisDOT. Contractor represents and warrants to the WisDOT or behalf of itself and its Subcontractors:

a. That all information it submits to the WisDOT or the OCIP administrator shall be accurate and complete.

b. That Contractor, on behalf of itself and its Subcontractors, has had the opportunity to read and analyze copies of the OCIP binders and specimen policies that are on file in the WisDOT's office. Any reference or summary in the contract, this special provision, the Insurance Manual, or elsewhere in any other contract document as to amount, nature, type or extent of OCIP coverage's and/or potential applicability to any potential claim or loss is for reference only. Contractor and its Subcontractors have not relied upon said reference but solely upon their own independent review and analysis of the OCIP coverage's in formulating any understanding and/or belief as to amount, nature, type or extent of any OCIP coverage's and/or its potential applicability to any potential claim or loss.

c. That the costs of OCIP coverage's were not included in Contractor's bid or proposal for the Work, the contract price, and will not be included in any change order, change modification, or any request for payment for the Work or extra work. The "costs of OCIP coverage's" is defined as the dollar amount of premiums, costs and fees the Contractor and its Subcontractors would have paid its insurance carrier to insure the operations and exposures which are being insured under the OCIP.

d. That Contractor acknowledges that the WisDOT will not pay or compensate Contractor or any Subcontractor, in any manner, for costs of OCIP coverage's or for "insurance costs" except as specifically required to be maintained by Contractor by the terms of this special provision.

11. Severability of Interests (Cross Liability):

All insurance required by this agreement (excluding only workers compensation insurance) shall include a provision or be endorsed to provide that, inasmuch as the policy is written to cover more than one insured, all terms, conditions, insuring agreements and endorsements, with the exception of limits of liability, shall operate in the same manner as if there were a separate policy covering each insured. No cross liability exclusions are permitted and there may not be any restrictions in any policies that limit coverage for a claim brought by an additional insured against a named insured. Also, there shall not be any provision in any insurance policy which excludes or conditions coverage on the existence of a contract or other agreement requiring insurance.

12. Breach of Insurance Requirements:

The Contractor's failure to obtain and maintain insurance coverages as required by this agreement shall constitute a material breach of the Contract. In such event WisDOT may at its option: (i) terminate the Contractor for default; or (ii) purchase such coverage and backcharge the premium and associated costs to the Contractor; or (iii) at their respective option, WisDOT and/or an additional insured can require the Contractor and/or its Subcontractors to pay for attorney's fees, expenses, damages and liability as a result of any claim or lawsuit to the extent coverage would have been provided to them under the Contractor's insurance but for the Contractor's breach WisDOT has the right to backcharge the Contractor for such sums. Furthermore, to the extent of their respective interest, the Insurers of those entities that were to be included as additional insureds are deemed to be third-party beneficiaries of the insurance procurement obligation.

13. **Subcontractor**:

Before permitting any Subcontractor to perform work under a subcontract, the Contractor shall require by written contract that the Subcontractor maintain insurance in like form and amounts to that required herein. The Contractor shall be responsible to ensure that each Subcontractor maintains insurance in like form and amounts and shall Provide evidence of same if requested. Contractor shall provide copies of its Subcontractor's certificates of insurance coverage to WisDOT or the OCIP Administrator upon request.

14. Notice of Cancellation:

All insurance coverages required by this agreement shall contain a provision that the coverage afforded thereunder cannot be cancelled, non-renewed, allowed to lapse, or have any restricted modifications added unless at least thirty (30) days prior written notice has been given to WisDOT. The Contractor is responsible to provide replacement coverage conforming with the requirements of this agreement in the event of any cancellation, non-renewal or modification of any insurance coverages required by this agreement.

15. Limits of Insurance:

The Contractor's insurance coverage and any additional insured coverage provided to WisDOT and any additional insured shall be for the full amount of any loss up to the policy(s) limits of liability and shall not be limited to the minimum insurance requirements of this Contract. The Contractor is responsible for notifying its insurance carriers in the event of a loss or potential loss involving coverage for the additional insureds. However, this does not prohibit any additional insureds from reporting a claim directly to the Contractor's insurance carriers.

16. Deductibles/Denial of Claims:

The Contractor shall be responsible, at no additional cost to WisDOT, for the payment of any deductibles or self-insured retention in connection with the insurance coverages required by this agreement, both for itself and all additional insureds. Any self-insured retention or deductible must be declared in writing at the time the Contractor submits its bid and must be specifically approved by WisDOT prior to execution of the Contract. The Contractor shall be responsible for any loss arising out of coverage denial by its insurance carrier. The Contractor may not procure policies that limit who may pay the SIR or deductible; rather, any SIR shall be payable by either the Contractor or the Subcontractor and the Contractor may not have a policy that prevents WisDOT from accessing or triggering coverage unless the SIR is paid by the Contractor. Contractor shall also ensure that similar conditions are incorporated into all subcontracts. In the event that WisDOT is required to pay any deductible and/or SIR to access any insurance policy, Subcontractor shall promptly reimburse the Contractor for such payment.

17. No Waiver of Insurance Requirements:

IT IS EXPRESSLY AGREED BETWEEN WISDOT AND THE CONTRACTOR THAT THE FAILURE OF WISDOT TO REQUIRE OR VERIFY COMPLETE AND TIMELY PERFORMANCE OF THE CONTRACTOR'S OBLIGATIONS UNDER THIS CONTRACT SHALL NOT BE A WAIVER BY WISDOT OF ANY RIGHT OF WISDOT TO REQUIRE THE CONTRACTOR TO COMPLY WITH THESE INSURANCE REQUIREMENTS AND/OR TO SEEK DAMAGES BECAUSE OF THE CONTRACTOR'S FAILURE TO COMPLY WITH THE INSURANCE REQUIREMENTS IN THIS CONTRACT.

18. Audits. Contractor agrees that the WisDOT, the OCIP administrator, and/or any OCIP insurer may audit Contractor's or any of its Subcontractor's Project payroll records, books and records, insurance coverage's, insurance cost information, or any other information

that Contractor provides to the WisDOT, the OCIP administrator, or the OCIP insurers to confirm their accuracy and to assure that costs of OCIP coverage's are not included in any payment for the work.

19. The WisDOT's Election to Modify or Discontinue OCIP. The WisDOT may, for any reason, modify the OCIP coverage's, discontinue the OCIP, or request that Contractor or any of its Subcontractors withdraw from the OCIP upon thirty (30) days written notice. Upon such notice Contractor and/or one or more of its Subcontractors, as specified by the WisDOT in such notice, shall obtain and thereafter maintain at the WisDOT's expense, Contractor Maintained Coverages (or a portion thereof as specified by the WisDOT) of the OCIP coverage's. The form, content, limits of liability, cost, and the insurer issuing such replacement insurance shall be subject to the WisDOT's approval.

20. Withhold of Payments. The WisDOT may withhold from any payment owing to Contractor the costs of OCIP coverage's if included in a request for payment. In the event the WisDOT audit of Contractor's records and information as permitted in the Contract, this special provision, or other contract documents reveals a discrepancy in the insurance, payroll, safety, or any other information required by the contract documents to be provided by Contractor to the WisDOT, or to the OCIP administrator, or reveals the inclusion of costs of OCIP coverage's in any payment for the work, the WisDOT will have the right to full deduction from the Contract Price of all such costs of OCIP coverage's and all audit costs. Audit costs will include but not be limited to the fees of the OCIP administrator, and the fees of attorneys and accountants conducting the audit and review. If the Contractor or its Subcontractors fail to timely comply with the provisions of this special provision or the requirements of the Insurance Manual, the WisDOT may withhold any payments due Contractor and its Subcontractors until such time as they have performed the requirements of this special provision. Such withholding by the WisDOT will not be deemed to be a default hereunder.

21. Waiver of Claim and Waiver of Subrogation:

Where permitted by law, Contractor hereby waives all rights of recovery under subrogation because of deductible clauses, inadequacy of limits of any insurance policy, limitations or exclusions of coverage, or any other reason against the WisDOT, the State of Wisconsin and any of its Agencies or Officer's, Agents or employees including without limitation, the OCIP administrator, its or their officers, agents, shareholders or employees of each, if any, and any other Contractor or Subcontractor performing work or rendering services on behalf of the WisDOT in connection with the planning, development and construction of the Project, and Contractor shall require that all Contractor maintained insurance coverage related to the work include clauses providing that each insurer shall waive all of its rights of recovery by subrogation for claims described above.

22. Waiver of Subrogation. Where permitted by law, Contractor shall also require that all Contractor maintained insurance coverage related to the work include clauses providing that each insurer shall waive all of its rights of recovery by subrogation against the WisDOT, the State of Wisconsin and any of its Agencies or Officer's, Agents or employees including without limitation, the OCIP administrator, its or their officers, agents, shareholders or employees of each, if any. Contractor shall require similar written express waivers and insurance clauses from each of its Subcontractors. A waiver of subrogation shall be effective as to any individual or entity even if such individual or entity (a) would otherwise have a duty of indemnification, contractual or otherwise, (b) did not pay the insurance premium directly or indirectly, and (c) whether or not such individual or entity has an insurable interest in the property damaged.

23. Conflicts. In the event of a conflict, the provisions of this special provision shall govern, then the provisions of the contract and its other related contact documents, then the provisions of the Insurance Manual.

24. Safety. Contractor shall be solely responsible for safety on the Project and safety relating to the Work. Contractor shall establish a safety program that, at a minimum, complies with all local, state and federal safety standards, and any safety standards established by the WisDOT for the Project, including the Project Safety and Health Plan Manual.
SEF-ZOO IC 13_0114

48. Subletting the Contract.

Replace standard spec 108.1.1 (3) with the following:

If proposing to have a party other than a subcontractor perform work, notify the engineer and submit details of this arrangement in writing. The engineer will determine if that arrangement constitutes subcontracting. Submit copies of all other agreements between any parties regarding the performance of work under the contract with the Request to Sublet.
SEF Rev. 13_0225

49. Incentive/Disincentive for Interim Completion of Work, Item 108.3100.S.

A General
This item shall consist of either an incentive payment or the assessment of a disincentive as specified below for the full opening of Bluemound Road

The full opening of Bluemound Road is defined as the contractor completing all of the work necessary to open Bluemound Road and adjacent side streets to all traffic lanes in each direction including the following prior to 12:01 AM Saturday, May 23, 2015, or within such extended time as may be allowed.

- Bluemound Road pavement marking, sidewalks, signage and lighting.
- 95th Street/Bluemound Road traffic signal and all associated detection, signage, pedestrian heads, conduit, and lighting.
- Bluemound/95th Street intersection including all approaches, pavement marking, sidewalks, lighting, and signage.
- 95th Street between Bluemound and Wisconsin Avenue including pavement marking, sidewalks, lighting, and signage.
- Wisconsin Avenue work at and east of 95th Street including pavement marking sidewalks, lighting and signage.

The completion time allowed for this contract is based on an expedited work schedule.

Under this Incentive/Disincentive plan, the department will not grant time extensions for the following:

1. Severe weather as specified in standard spec 108.10.2.2.
2. Labor disputes that are not industry wide.
3. Delays in material deliveries.

Each day shall be defined as a 24 hour period beginning at 12:01 AM.

The maximum incentive payment, as shown on the Schedule of Items, is for department accounting purposes. The actual incentive payment the contractor may receive shall be in accordance to section B of this provision.

Incentive payments will not be considered as part of the money value of the work completed for computing time extensions.

B Incentive Payment

The contractor shall be entitled to an incentive payment for completion of all of the work necessary to fully reopen Bluemound Road as defined above in Section A prior to 12:01 AM, Saturday, May 23, 2015 or such extended time as may be allowed.

The incentive payment shall be paid at the rate of $10,000 per calendar day for each day or portion thereof, of completion prior to 12:01 AM Saturday, May 23, 2015. The maximum amount of incentive payment shall not exceed $600,000.

C Disincentive Pay Reduction

Should the contractor fail to complete all of the work necessary to fully reopen Bluemound Road as defined above is section A under this contract prior to 12:01 AM, Saturday, May 23, 2015 or within such extended time as may be allowed, the contractor shall be liable to the department for a pay reduction in the amount of $10,000 per day or portion thereof, for each calendar day after 12:01 AM, Saturday, May 23, 2015, that work remains incomplete.

If contract time expires before completing all work specified in the contract, additional liquidated damages according to standard spec 108.11 will be affixed in addition to the disincentive pay reduction.

D Measurement and Payment

Incentive/Disincentive for interim Completion of Work will be measured by the calendar day and will be paid for at the contract unit price per calendar day.

The unit price per day based on the incentive pay adjustment shall be compensation in full for completing the work as hereinbefore specified.

The unit price per day based on the disincentive pay reduction shall be assessed for failing to complete all the work as hereinbefore specified.

108-056 (20080501)

50. Pay Plan Quantity.

A Bid Items Designated as Pay Plan Quantity

Replace standard spec 109.1.1.2 with the following:

If the schedule of items designates a bid item with a **P** in the title, the department will not measure that bid item. The department will use the plan quantity, the approximate quantity shown on the schedule of items, for payment unless a contract revision affects a designated bid item.

If the engineer revises the contract under standard spec 104.2, the department will adjust the quantity of designated items that are affected by the revised work. The engineer will adjust the affected quantity, with a contract modification as defined in standard spec 101.3, regardless of the magnitude of the revised work, which may result in either an increase or a decrease from the quantity shown on the schedule of items. The department will measure revised work as specified in standard spec 109.1.1.1. If the engineer revises the contract to eliminate a designated item, the engineer will not pay for the designated item, except as specified in standard spec 109.5.

The approximate quantity shown on the schedule of items for a designated item is for information only and only an estimate. The engineer makes no guarantee that the quantity, which can be determined by computations based on contract information, will equal the approximate quantity shown on the schedule of items. The engineer will not make a quantity adjustment for discrepancies.

SEF Rev. 12_0510

51. Force Account.

Supplement standard spec 109.4.5.1 (3)1 with the following:

Include accumulation of wages to date for each employee performing force account work and identify allowable Federal Unemployment Tax (FUTA) and State Unemployment Tax (SUTA) multipliers.
SEF Rev. 13_0228

52. Clearing and Grubbing, Emerald Ash Borer.

This applies to projects in the emerald ash borer (EAB) quarantined zones to include Fond du Lac, Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha counties.

Supplement standard spec 201.3 with the following:

The emerald ash borer (EAB) has resulted in a quarantine of ash trees (*Fraxinus sp.*) by the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) and the Wisconsin Department of Natural Resources (DNR).

Ash trees species attacked by emerald ash borer include the following:

(a) Green ash (F. pennsylvanica) is found throughout the state, but is most common in southern Wisconsin. It may form pure stands or grow in association with black ash, red maple, swamp white oak, and elm. It grows as an associate in upland hardwood stands, but is most common in and around stream banks, floodplains, and swamps.
(b) Black ash (F. nigra) is distributed over the entire state but is most frequently found in northern Wisconsin. It is most common in swamps, but is also found in other wet forest types.
(c) Blue ash (F. quadrangulata) is a threatened species that is currently found only at a few sites in Waukesha County. The species is at the edge of its range in Wisconsin, but is common in states farther south. The species is not of commercial importance. Blue ash twigs are 4-sided.
(d) White ash (F. americana) tends to occur primarily in upland forests, often with Acer saccharum.

The quarantine of ash trees includes all horticultural cultivars of the species listed above.

Note that blue ash twigs are 4-sided. All other Wisconsin ash trees have round stems. Also, Mountain ash (*Sorbus americana and S. decora*) is not a true ash and is not susceptible to EAB infestation.

The contractor shall be responsible for hiring a certified arborist to identify all ash trees that will be cleared and grubbed for the project. In addition, prior to scheduled clearing

and grubbing activities, the arborist shall mark all ash trees with florescent lime flagging tied around the trunk perimeter.

Follow and obey the following Wisconsin Department of Agriculture, Trade, and Consumer Protection order:

ATCP 21.17 Emerald ash borer; import controls and quarantine.

Importing or Moving Regulated Items from Infested Areas; Prohibition.
Except as provided in subparagraph (3), no person may do any of the following:

(a) Import a regulated item under sub. (2) into this state if that item originates from an emerald ash borer regulated area identified in 7CFR 301.53-3.

(b) Move any regulated item under sub. (2) out of an emerald ash borer regulated area that is identified in 7CFR 301.53-3 and located in this state.

Note: the United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) periodically updates the list of regulated areas in 7CFR 301.53-3. Subsection (1) applies to new regulated areas as those areas are identified in the CFR.

Regulated Items. The following are regulated items for purposes of subparagraph (1):

The emerald ash borer, Agrilus planipennis Fairmaire in any living stage.

Ash trees.

Ash limbs, branches, and roots.

Ash logs, slabs or untreated lumber with bark attached.

Cut firewood of all non-coniferous species.

Ash chips and ash bark fragments (both composted and uncomposted) larger than one inch in diameter.

Any other item or substance that may be designated as a regulated item if a DATCP pest control official determines that it presents a risk of spreading emerald ash borer and notifies the person in possession of the item or substance that it is subject to the restrictions of the regulations.

Regulatory Considerations
The quarantine means that ash wood products may not be transported out of the quarantined area.

Clearing and grubbing includes all ash trees that are to be removed from within the project footprint. If ash trees are identified within clearing and grubbing limits of the project, the following measures are required for the disposal:

Chipped Ash Trees
May be left on site if used as landscape mulch within the project limits. If used as mulch on site, chips may not be applied at a depth greater than standard mulch applications as this will impede germination of seeded areas.

May be buried on site within the right-of-way in accordance to standard spec 201.3 (14).

May be buried on adjacent properties to projects within the quarantined zone with prior approval of the engineer in accordance to standard spec 201.3 (15).

May be trucked to a licensed landfill within the quarantined zone with the engineer's approval in accordance to standard spec 201.3 (15).

Burning chips is optional if in compliance with standard spec 201.3.

Chips must be disposed of immediately if not used for project mulching and may not be stockpiled and left on site for potential transport by others. Chips may be stockpiled temporarily if they will be used for project mulching and are not readily accessible to the public.

Chipper equipment must be cleaned following post-chipping activities to ensure no spread of wood chip debris into non-quarantined counties.

Ash logs, Branches, and Roots
May be buried without chipping within the existing RIGHT-OF-WAY or on adjacent properties in accordance to standard spec 201.3 (14)(15).

May be trucked to a licensed landfill within the quarantined zone with the engineer's approval in accordance to standard spec 201.3 (15).

Burning is optional if in compliance with standard spec 201.3.

Ash logs, branches, and roots must be disposed of immediately and may not stockpiled.

All additional costs will be incidental to clearing and grubbing items.

Do not bury or use mulch in an area that will be disturbed again during later phases of the project.

Anyone moving firewood or ash products from the state or these counties is subject to state and federal fines up to $1,000.00. All fines are the responsibility of the contractor.

Obtain updated quarantine information at the DNR Firewood Information Line at (800) 303-WOOD.

Furnishing and Planting Plant Materials
Supplement standard spec 632.2.2 with the following:

Ash trees may be obtained from inside or outside the quarantine area and planted within the quarantined area. Ash trees from within the quarantine area may not be transported and planted into the non-quarantined area.

Updates for Compliance
Each year, as a service, the Wisconsin department of agriculture, trade and consumer protection distributes an updated federal CFR listing to nursery license holders and other affected persons in this state. More frequent updates, if any, are available on the Department of Agriculture, Trade, and Consumer Protection (DATCP) website at **www.datcp.state.wi.us** . Subsection (1) applies to new regulated areas as those areas are identified in the CFR, regardless of whether affected persons receive update notices from the DATCP. Persons may request update notices by calling (608) 224−4573, by visiting the DATCP website, or by writing to the following address:

Wisconsin Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Resource Management
P.O. Box 8911
Madison WI 53708−8911

Regulated Items
More frequent updates, if any, are available on the DATCP website at **www.datcp.state.wi.us** . Subsection (1) applies to new regulated areas as those areas are identified in the CFR, regardless of whether affected persons receive update notices from DATCP. Persons may request update notices by calling (608) 224−4573, by visiting the DATCP website, or by writing to the above address.
201-SER1 (20100401)

53. Abatement of Asbestos Containing Material Structure B-40-0088, Item 203.0210.S.0001; Abatement of Asbestos Containing Material Structure B-40-0090, Item 203.0210.S.0002; Abatement of Asbestos Containing Material Structure B-40-0091, Item 203.0210.S.0003; Abatement of Asbestos Containing Material Structure B-40-0092, Item 203.0210.S.0004; Abatement of Asbestos Containing Material Structure B-40-0093, Item 203.0210.S.0005; Abatement of Asbestos Containing Material Structure B-40-0095, Item 203.0210.S.0006; Abatement of Asbestos Containing Material Structure B-40-0098, Item 203.0210.S.0007; Abatement of Asbestos Containing Material Structure B-40-0099, Item 203.0210.S.0008; Abatement of Asbestos Containing Material Structure B-40-0106, Item 203.0210.S.0009; Abatement

of Asbestos Containing Material Structure B-40-0129, Item 203.0210.S.0010; Abatement of Asbestos Containing Material Structure B-40-0130, Item 203.0210.S.0011; Abatement of Asbestos Containing Material Structure B-40-0131, Item 203.0210.S.0012.

A Description
This special provision describes abating asbestos containing material on structures in accordance to the plans, the pertinent provisions of the standard specifications, and as hereinafter provided.

B (Vacant)

C Construction
Thomas McCoy, License Number All-117261, inspected Structure B-40-0088 for asbestos on April 23, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0088
Utilities; Overhead Lights; Bridge Deck-West; 9-(1 feet x 15 feet).

Gaskets; Bridge Ramp – Northeast; Bridge Deck-Southwest; Bridge Deck – West Center, 82-(1 foot x 1 foot).

Timothy G. Petrofske, License Number All-115985, inspected Structures B-40-0090, B-40-0091 and B-40-0093 for asbestos on June 3, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0090
Utilities; Electrical Boxes; Bridge Abutment; Bridge Column; 1-(1 feet x 1 feet); 2-(1 feet x 3 feet),

Utilities; Conduit-Metal; Bridge Abutment West; 1-(2 in x 70 feet),

Utilities; Lights; Bridge Deck Underside Center; 4-(1 feet x 1 feet).

B-40-0091
Utilities; Conduit-Fiberglass; Bridge Parapet-North; 2-(173 feet x 3 in);

Utilities; Lights; Bridge Deck Underside; 4-(1 feet x 1 feet);

Utilities; Electrical Boxes; Bridge Parapet and Bridge Column; 2-(3 feet x 3 feet); 2-(3 feet x 1 feet).

B-40-0093
Utilities.

Timothy G. Petrofske, License Number All-115985, inspected Structure B-40-0092 for asbestos on June 1, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0092
Utilities; Light Poles; Bridge Parapet; 4-(25 feet x 6 in),

Utilities; Pipe-Steel; Bridge Deck Underside; 1-(212 feet x 12 in),

Utilities; Pipe-Steel; Bridge Deck Underside; 3-(3 in x 212 feet),

Utilities; Electrical Boxes; Bridge Column; 4-(1 feet x 1 feet).

Locktite; Bridge Railing – Southwest Bolts and Southeast Bolts; 48-(1 in x 1 in),

Timothy G. Petrofske, License Number All-115985, inspected Structure B-40-0095 for asbestos on June 23, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0095
Utility; Electric Box; Bridge Parapet; 2-(3 feet x 4 ft).

Timothy G. Petrofske, License Number All-115985, inspected Structure B-40-0098 for asbestos on June 8, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0098
Utilities; Electrical Box; Bridge Parapet Northeast/Southeast; 2-(4 feet x 3 feet).

Timothy G. Petrofske, License Number All-115985, inspected Structure B-40-0099 for asbestos on June 9, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0099
Utilities; Electrical Box; Bridge Parapet-Northeast/Southeast; 2-(4 feet x 3 feet).

Timothy G. Petrofske, License Number All-115985, and Thomas MoCoy, License Number All-117261, inspected Structure B-40-0106 for asbestos on June 22, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0106
Tar Board – Black; Bridge Parapet – Southeast; Category I Non-Friable; 2 (295 feet x 6 in),

Tar Board – Black; Bridge Parapet – Southeast; Category I Non-Friable; 2 (295 feet x 6 in),

Tar Board – Black; Bridge Parapet – Northeast; Category I Non-Friable; 2 (295 feet x 6 in).

Timothy G. Petrofske, License Number All-115985, inspected Structures B-40-0129, B-40-130 and B-40-131 for asbestos on May 26, 2009. Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

B-40-0129
Utilities; Pipe- Steel; Bridge Deck Underside; Category II Non-Friable; 3-(214 feet x 3 in),

Utilities; Light Poles; Bridge Parapet; Category II Non-Friable; 2 (35 feet x 6 in).

B-40-0130
Utilities; Light Poles; Bridge Parapet; Category II Non-Friable; 2 (35 feet x 6 in).

B-40-0131
Utilities; Light Poles; Bridge Parapet; Category II Non-Friable; 5 (35 feet x 6 in).

The RACM on this structure must be abated by a licensed abatement contractor. A copy of the inspection report is available from James Keegan @ 414-750-3311. In accordance to NR447 and DHS159, ensure that DNR or DHS receives a completed Notification of Demolition and/or Renovation (DNR Form 4500-113 (R 4/11), or subsequent revision) via U.S. mail, hand-delivery, or using the online notification system at least 10 working days prior to beginning any construction or demolition. Pay all associated fees. Provide a copy of the completed 4500-113 form and the abatement report to Mike Cape @ (414) 750-1538 and DOT BTS-ESS attn: Hazardous Materials Specialist PO Box 7965, Madison, WI, 53707-7965. In addition, comply with all local or municipal asbestos requirements.

Use the following information to complete WisDNR form 4500-113 :

B-40-0088

- Site Name: Structure B-40-0088, 73rd St Pedestrian Overpass over IH 94 E-W Freeway
- Site Address: 1.7M W JCT USH 41, Milwaukee.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 51 years old. This structure was constructed in 1963.
- Area: 1935 SF of deck

B-40-0090

- Site Name: Structure B-40-0090, IH 94 eastbound E-W Freeway over STH 181-S 84th St
- Site Address: 0.9M E JCT USH 45, Milwaukee.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 51 years old. This structure was constructed in 1963.
- Area: 10987 SF of deck

B-40-0091

- Site Name: Structure B-40-0091, IH 94 westbound E-W Freeway over STH 181-S 84th St
- Site Address: 2.5M W JCT USH 41 to N, Milwaukee.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 51 years old. This structure was constructed in 1963.
- Area: 10987 SF of deck

B-40-0092

- Site Name: Structure B-40-0092, S 92nd St over IH 94 E-W Freeway
- Site Address: 0.5M S JCT USH 18, Milwaukee.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 52 years old. This structure was constructed in 1962.
- Area: 17808 SF of deck

B-40-0093

- Site Name: Structure B-40-0093, IH 94 E-W Freeway over Honey Creek
- Site Address: 0.2M E JCT STH 181 to N, Milwaukee.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 51 years old. This structure was constructed in 1963.
- Area: 49060 SF of box culvert's top slab

B-40-0095

- Site Name: Structure B-40-0095, IH 894 westbound-USH 45 westbound over Schlinger Avenue
- Site Address: 0.7M W JCT STH 59 to E, West Allis
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 54 years old. This structure was constructed in 1960.
- Area: 12194 SF of deck

B-40-0098

- Site Name: Structure B-40-0098, IH 894 westbound-Zoo Interchange over CMSTPP RR
- Site Address: 0.8M W JCT STH 59 to E, Milwaukee.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 51 years old. This structure was constructed in 1963.
- Area: 6372 SF of deck

B-40-0099

- Site Name: Structure B-40-0099, USH 45 northbound-Zoo Freeway over CMSTPP RR
- Site Address: 0.1M N JCT IH 894 to W, Milwaukee.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 51 years old. This structure was constructed in 1963.
- Area: 8230 SF of deck

B-40-0106

- Site Name: Structure B-40-0106, Chicago and Northwestern Railroad over IH 94 E-W Freeway
- Site Address: 3207N21E, West Allis.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 51 years old. This structure was constructed in 1963.
- Area: N/A SF of deck

B-40-0129

- Site Name: Structure B-40-0129, USH 18 eastbound-Bluemound Rd over USH 45-Zoo Freeway
- Site Address: 0.7M E JCT STH 100, Wauwatosa.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 53 years old. This structure was constructed in 1961.
- Area: 9523 SF of deck

B-40-0130

- Site Name: Structure B-40-0130, USH 18 westbound-Bluemound Rd over USH 45-Zoo Freeway
- Site Address: 0.8M W JCT STH 181, Wauwatosa.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 53 years old. This structure was constructed in 1961.
- Area: 9523 SF of deck

B-40-0131

- Site Name: Structure B-40-0131, W. Wisconsin Ave over USH 45-Zoo Freeway
- Site Address: 0.7M E JCT STH 100, Wauwatosa.
- Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI 53187-0798
- Contact: Mark Klipstein
- Phone: (414) 750-1496
- Age: 54 years old. This structure was constructed in 1960.
- Area: 17501 SF of deck

Insert the following paragraph in Section 6.g.:

- If asbestos not previously identified is found or previously non-friable asbestos becomes crumbled, pulverized, or reduced to a powder, stop work immediately, notify the engineer, and the engineer will notify the department's Bureau of Technical Services at (608) 266-1476 for an emergency response in accordance to standard spec 107.24. Keep material wet until it is abated or until it is determined to be non-asbestos containing material.

D Measurement

The department will measure Abatement of Asbestos Containing Material (Structure), completed in accordance to the contract and accepted, as a single complete unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
203.0210.S.0001	Abatement of Asbestos Containing Material Structure B-40-0088	LS
203.0210.S.0002	Abatement of Asbestos Containing Material Structure B-40-0090	LS
203.0210.S.0003	Abatement of Asbestos Containing Material Structure B-40-0091	LS
203.0210.S.0004	Abatement of Asbestos Containing Material Structure B-40-0092	LS
203.0210.S.0005	Abatement of Asbestos Containing Material Structure B-40-0093	LS
203.0210.S.0006	Abatement of Asbestos Containing Material Structure B-40-0095	LS
203.0210.S.0007	Abatement of Asbestos Containing Material Structure B-40-0098	LS
203.0210.S.0008	Abatement of Asbestos Containing Material Structure B-40-0099	LS
203.0210.S.0009	Abatement of Asbestos Containing Material Structure B-40-0106	LS
203.0210.S.0010	Abatement of Asbestos Containing Material Structure B-40-0129	LS
203.0210.S.0011	Abatement of Asbestos Containing Material Structure B-40-0130	LS
203.0210.S.0012	Abatement of Asbestos Containing Material Structure B-40-0131	LS

Payment is full compensation for submitting necessary forms; removing all asbestos; properly disposing of all waste materials; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

203-005 (20120615)

54. Removing Old Culverts and Bridges.

Supplement standard spec 203.3.1 with the following:

(5) Structure Removal Site Safety Plan

Prepare a Structure Removal Site Safety Plan covering all structure removal work included in the contract. Maintain posted copies of the Structure Removal Site Safety Plan at the site in the project field office. Provide two copies of the Structure Removal Site Safety Plan to the engineer at least four weeks prior to beginning removal work.

(6) Structure Removal Plans

Prepare a structure removal plan for each structure removal included in the contract indicating the methods and sequence of demolition. The contractor is strongly encouraged to examine existing structure plans and visit the site prior to preparing a structure removal plan. The contractor shall be responsible for the methods and sequence of demolition, including effects on the overall stability of each structure being removed. At a minimum, the plan shall include:

1. The name of the professional engineer, registered in the state of Wisconsin who will be on site and monitor the removal of existing structures as required in this specification.

2. The name of the contractor's on-site-employee designated in responsible charge of all removal operations.

3. The removal method and sequence of removal for each individual structure, including the staging of bridge removals.

4. Analysis of the stability of the structure based on the methods and sequence of demolition proposed, to ensure that the structure is demolished in a safe and controlled manner. The analysis computations shall be prepared, signed and sealed by a professional engineer registered in the State of Wisconsin.

5. Design and details of temporary supports, shoring or temporary bracing, if required to stabilize portions of partially remaining structures during the removal sequence or support partially remaining structures after staged removals. The removal plan shall include design computations and detail drawings for all temporary supports, shoring and bracing that indicate the exact placement of the temporary supports, shoring or bracing; verification of design loads; attachment details; and methods for the safe transfer of loads from existing structural elements to be removed to the temporary supports, shoring, or bracing. Temporary support, shoring, or bracing design computations and drawings details are to be prepared, signed and sealed by a professional engineer registered in the State of Wisconsin.

6. Design and details of temporary support foundations. Foundation design shall include evaluation of expected foundation settlement and the effect that this will have on the structure being supported. Temporary support foundation design computations and drawing details are to be prepared, signed and sealed by a professional engineer registered in the State of Wisconsin.

7. Equipment type and locations of equipment on the structure(s) or adjacent roadways during the removal operations

8. Locations and type of work to be performed directly adjacent to traffic.

9. Details and locations of protective covers and other measures to ensure that people, property and improvements will not be endangered or damaged as a result of the removal operations. This shall include methods for protecting any pavement surfaces including shoulders, concrete barriers, and other highway features.

10. Methods of removal, proposed haul route(s) and disposal, the proposed haul route, method of hauling, and proposed destination.

11. A schedule of anticipated roadway and lane closures to accommodate removal operations. Include the timing of individual lane or temporary roadway closures and the nature of removal operations that will be performed during the lane or roadway closures.

12. Acknowledgement that the contractor and removal design engineer responsible for preparing the removal plan have visited the site and reviewed the existing structure plans in preparing the removal plan.

(7) Structure Pre-Removal Meetings
After submission of the Structure Removal Site Safety Plan and Structure Removal Plan(s), schedule and conduct structure pre-removal meetings at a time agreed to by the engineer. Hold structure pre-removal meetings at least three working days prior to beginning structure removal activities. If the engineer agrees in advance, multiple structure removals can be combined and discussed at one structure pre-removal meeting. Otherwise schedule and conduct a separate structure pre-removal meeting for each structure to be removed.

Supplement standard spec 203.3.2.1 with the following:

(4) Perform structure removals in accordance to the submitted Structure Removal Site Safety Plan and Structure Removal Plans.

Supplement standard spec 203.5.1(2) with the following:

Payment includes preparation and submittal of a Structure Removal Site Safety Plan; preparation and submittal of Structure Removal Plans and performing all structure removal work in accordance to the submitted plans.

55. Pavement Breaking Equipment.

Use only hydraulic pavement breaking equipment for breaking pavement within 300 feet of any structure. Do not use guillotine, drop hammer, falling weight, gravity impact breakers or equivalent equipment. A multi-head hydraulic drop hammer is allowed unless a structure is within 50 feet of the roadway.
SEF Rev. 14_0415

56. Removing Concrete Barrier.

Supplement standard spec 204.3.2.2 with the following:

Under the Removing Concrete Barrier bid item, remove barrier to the depth and location the plans show. Removal includes full-width and full-height vertical saw cutting. Removal includes sawing per standard spec 690.

Supplement standard spec 204.5.1(2) with the following:

Payment for Removing Concrete Barrier is full compensation for full-width and full-height saw cutting of existing barrier and slurry removal.

57. Removing Concrete Surface Partial Depth, Item 204.0109.S.

A Description
This special provision describes removing a portion of the concrete surfaces as shown on the plans according to standard spec 204, and as hereinafter provided.

B (Vacant)

C Construction
C.1 Equipment
Use a machine that provides a surface finish acceptable to the engineer. Shroud the machine to prevent discharge of any loosened material into adjacent work areas or live traffic lanes.

Use a machine that is equipped with electronic devices that provide accurate depth, grade and slope control, and acceptable dust control system.

C.2 Methods
Remove existing concrete to the depths as shown on the plan by grinding, planing, chipping, sawing, milling, or by using other methods approved by the engineer.

Perform the removal operation in such a manner as to preclude damage to the remaining pavement and results in a reasonable uniform plane surface free of excessive large scarification marks and having a uniform transverse slope.

The sequence of removal operations shall be such that no exposed longitudinal joints 2 inches or more in depth remain during non-working hours. Windrowing or storing of the removed material on the roadway will only be permitted in conjunction with a continuous removal and pick-up operation. During non-working hours, clear the roadway of all materials and equipment.

The removed pavement shall become the property of the contractor. Properly dispose of it according to standard spec 204.3.1.3.

D Measurement
The department will measure Removing Concrete Surface Partial Depth in area by the square foot of surface area removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
204.0109.S	Removing Concrete Surface Partial Depth	SF

Payment is in full compensation for removing the concrete; and for disposing of materials.
204-041 (20080902)

58. Removing or Abandoning Miscellaneous Structures.

Standard spec 204.5.1(3) is deleted in its entirety and replaced with the following:

When backfilling with Backfill Granular as specified in this special provision articles or as directed by the engineer, the item Backfill Granular is considered incidental to the appropriate bid item.

At locations where Backfill Granular is not specified, contractor may choose to use either Backfill or Backfill Granular, and no separate payments will be made for using Backfill Granular.
SEF Rev. 13_0122

59. Removing Crash Barrels, Item 204.9060.S.0001.

A Description
This special provision describes removing crash barrels in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Removing Crash Barrels in each array.

E Payment
Supplement standard spec 204.5 to include the following:

ITEM NUMBER	DESCRIPTION	UNIT
204.9060.S.0001	Removing Crash Barrels	Each

204-025 (20041005)

60. Removing Apron Endwall, Item 204.9060.S.0002.

A Description
This special provision describes removing Apron Endwall in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Removing Apron Endwall as each individual apron endwall, acceptably completed.

E Payment
Supplement standard spec 204.5 to include the following:

ITEM NUMBER	DESCRIPTION	UNIT
204.9060.S.0002	Removing Apron Endwall	Each

204-025 (20041005)

61. Removing Noise Barrier, Item 204.9090.S.0001.

A Description
This special provision describes Removing Noise Barrier, including supports, footings and panels, in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C (Vacant)

D Measurement
The department will not measure Removing Noise Barrier. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
Supplement standard spec 204.5 to include the following:

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
204.9090.S.0001	Removing Noise Barrier	LF

62. Removing Retaining Wall, Item 204.9090.S.0002.

A Description
This special provision describes Removing Retaining Wall, including supports, footings and panels, in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C (Vacant)

D Measurement
The department will not measure Removing Retaining Wall. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
Supplement standard spec 204.5 to include the following:

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
204.9090.S.0002	Removing Retaining Wall	LF

63. Removing Decorative Fence, Item 204.9090.S.0003.

A Description
This special provision describes removing decorative fence in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C Construction
The existing decorative fence and brick masonry posts at the 9000 W. Chester Street driveway shall be removed. The means and methods of removing the fence and brick masonry posts shall be determined by the contractor. Removal of the decorative fence shall not damage existing features on the property. Any collateral damage shall be remedied and repaired at the contractor's expense. The contractor shall include the cost of any and all methods that may be needed for the expected removal of the materials under this bid item.

D Measurement
The department will not measure Removing Decorative Fence. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
Supplement standard spec 204.5 to include the following:

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
204.9090.S.0003	Removing Decorative Fence	LF

Payment is full compensation for removing and disposing of the metal fence and brick masonry posts.

64. Removing Drain Slotted Vane, Item 204.9090.S.0005.

A Description
This special provision describes Removing Drain Slotted Vane in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Removing Drain Slotted Vane in linear feet, acceptably completed.

E Payment
Supplement standard spec 204.5 to include the following:

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
204.9090.S.0005	Removing Drain Slotted Vane	LF

No additional payments will be made for removing vane grates and pipes and is considered incidental to this bid item.
204-025 (20041005)

65. Roadway Excavation.

Add the following to standard spec 205.5.2(1):

Provide the department with an earth flow diagram within 30 calendar days of receiving the contract Notice to Proceed.

Identify all excavation required for the project, all sources of embankment fill, shrinkage and swell factors, proposed stockpile material, structure excavation (if used in embankments), waste, and fills anticipated to be treated with a soil drying agent. Provide start and finish dates for each grading area within the division. These dates should correspond to the dates shown on the project schedule.

The earth flow diagram will show placement of roadway embankment utilizing excavated material under the Excavation, Hauling, and Reuse of Solid Waste Soil item.

Any deviation from the sequencing shown in the earth flow diagram will require approval from the engineer, and will require an update to the earth flow diagram.

Add the following to standard spec 205.5.2(2):

The department will not pay EBS to remove frost from embankments or cut sections. It is the contractor's responsibility to stage construction so that exposed subgrades do not freeze or to provide adequate frost protection. Any work necessary to remove and replace frozen materials from newly constructed embankments or exposed cut sections is considered incidental to the excavation bid items.

66. Excavation For Structures Retaining Walls.

Modify the standard specifications as follows:

206.2 Materials
Add the following to the end as paragraph three and four:

(3) If the plan details call for Controlled Low Strength Material (CLSM), provide CLSM for backfill consisting of a designed cementitious mixture of natural or processed materials. Allowable materials include natural sand, natural gravel, produced sand, foundry sand, produced gravel, fly ash, Portland cement, and other broken or fragmented mineral materials. The designed mixture shall have a consistent texture and flow characteristics, be self-leveling and not exhibit shrinkage after hardening. Design the mixture to reach a state of hardening such that it can support foot traffic in no more than 24 hours. Provide a mixture that also meets the following requirements:

Test	Method	Value
Flow	ASTM D-6103	9-inches minimum
Compressive Strength	ASTM D-6024	20 - 40 psi @ 14 days 40 - 80 psi @ 28 days 80 -120 psi @ 90 days

Chemical admixtures to control air content and setting time are allowable. Ten days prior to placement, furnish the engineer with a design mix detailing all components and their proportions in the mix. Also, provide documentation from the supplier of the industrial byproducts that the foundry sand and fly ash used in the mixture meet the requirements for Industrial Byproducts Categories 1, 2, 3, or 4 in NR 538 of the Wisconsin Administrative Code for use as a confined geotechnical fill.

(4) If the plan details call for flowable backfill, provide backfill material consisting of aggregates that conform to standard spec 501 for Grade A Concrete and do not add any cementitous material; cement or fly ash, to the flowable fill mix. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily.

206.3.13.1 General
Add the following to the end as paragraph thirteen and fourteen:

(13) For soldier pile retaining walls, when called for in the plans, backfill around soldier piles above the soldier pile foundations with CLSM as shown on the plans. If the official Weather Bureau forecast for the construction site predicts temperatures at or below freezing within the next 24 hours after placement of controlled low strength backfill, protect the placed materials from freezing during that time period. If the temperature is not forecast to rise above 40º F for 72 hours after placement, the engineer may require protection from freezing for up to 72 hours. No controlled low strength backfill shall be allowed to enter any stream, lake, or sewer system. The contractor shall be responsible for any clean up or remediation costs resulting from such occurrences.

(14) For soldier pile retaining walls, when called for on the plans, fill all voids behind timber lagging and excavated soil with flowable backfill. Prior to placement of flowable backfill, provide for positive drainage of the area to be backfilled. Discharge from the truck in a manner to prevent segregation. Completely fill excavation in a single operation. Consolidation or compaction effort is not required.

206.5.2 Excavation For Structures
Add the following to the end as paragraphs eight and nine:

(8) Payment for Structure Excavation Retaining Walls includes providing and placing CLSM as backfill when CLSM as backfill is called for on the plans.

(9) Payment for Structure Excavation Retaining Walls includes providing and placing flowable backfill when flowable backfill is called for on the plans.

67. QMP Subgrade.

A Description
This special provision describes requirements for subgrade materials within the roadway foundation as defined in standard spec 101.3. Conform to standard spec 207 as modified in this special provision for all work within the roadway foundation at the following locations:

USH 45, IH 94, IH 894 Mainline, all Temporary and Permanent Freeway Ramps, Temporary Widening, Crossroad Mainline, Local roads, and Temporary roads

Provide and maintain a quality control program. A quality control program is defined as all activities, including process control inspection, sampling and testing, documentation, and necessary adjustments in the process that are related to the construction of subgrade which meets all the requirements of this provision.

Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes sampling and testing procedures. The contractor may obtain the CMM from the department's web site at:

http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm

B Materials

B.1 Quality Control Plan

Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not perform grading work before the engineer reviews and accepts the plan. Construct the project as the plan provides.

Do not change the quality control plan without the engineer's review. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in the contractor's laboratory as changes are adopted. Ensure that the plan provides the following elements:

1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication process that will be used, and action time frames.
3. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.
4. Location of the QC laboratory, retained sample storage, and control charts and other documentation.
5. A summary of the locations and calculated quantities to be tested under this provision.
6. An explanation regarding the basis of acceptance for material that cannot be tested by nuclear methods due to a high percentage of oversized particles.

B.2 Personnel

Perform the quality control sampling, testing, and documentation required under this provision using HTCP certified technicians. Have a grading technician certified under HTCP at level I (or ACT Grading Technician under the direction of a certified technician) present at the site during all subgrade preparation, fill placement, compaction, and nuclear testing activities. Have a nuclear density technician certified under HTCP at level I perform field density and field moisture content testing.

B.3 Laboratory

Perform quality control testing in a department-qualified laboratory. Obtain information on the Wisconsin laboratory qualification program from:

Materials Laboratory
3502 Kinsman Boulevard
Madison, Wisconsin 53704-2583
Telephone: (608) 246-7938
http://www.dot.state.wi.us/business/engrserv/lab-qualification.htm

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B.4 Equipment

Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the CMM and maintain a calibration record at the laboratory.

Furnish nuclear gauges from the department's approved product list at http://www.atwoodsystems.com/materials. Ensure that the gauge manufacturer or an approved calibration service calibrates the gauge within 12 months before using it on the project. Retain a copy of the calibration certificate with the gauge. Nuclear density gauge calibration verification is required daily when earthwork construction operations require testing under this special provision article. This calibration verification shall be performed using the departments "Validator" apparatus which is located at the Zoo Interchange Construction Field Office: 2424 S. 102nd St., West Allis, Wisconsin 53227. Establish a standard gauge reading for the "Validator" using the ten test average method. The source emitter depth for calibration verification, in the direct transmission mode, will be determined by the engineer. This procedure will establish the "Validator" apparatus, as the contractor's project reference site.

Conform to ASTM D 2950 and CMM 8.15 for density testing and gauge monitoring methods. Perform nuclear gauge measurements using gamma radiation in the backscatter or direct transmission position. Perform each test for 4 minutes of nuclear gauge count time.

B.5 Soil Source Study

Conduct and submit a soil source study before beginning of grading operations. Ensure that this study identifies each distinct soil type on the project within the top 15 feet of cut areas and all borrow material. Provide the in-bank natural moisture content for each soil. Develop moisture-density curves for each identified soil type by utilizing AASHTO T 99, with a minimum of 5 individual points, and a zero air voids curve at a specific gravity of 2.65. If a different specific gravity is used perform a specific gravity test. Determine the maximum density and corresponding optimum moisture level for each soil type. Develop a site-specific family of Proctor curves for this contract from the completed soil source study and submit to the engineer for review and acceptance.

Perform characterization tests on each of the soil types selected for the soil source study. The tests for roadway include AASHTO T 89, AASHTO T 90, AASHTO T 27, and AASHTO T 11. Classify each soil type selected according to the AASHTO soil classification system based on the characterization tests. Do not begin grading operations until the engineer accepts the soil source study.

Use the soil types identified in the soil source study with corresponding maximum densities and optimum moisture values to determine the compaction compliance on the project. Continue the soil source study in those areas of cuts greater than 15 feet that were not accessible during the initial study. Include data on additional soil types if project conditions change. Ensure that tests of additional soil types are complete and the engineer accepts the results before incorporating the material into the roadway foundation.

Split each Proctor sample and identify so as to provide comparison with the department's test results. Unless the engineer directs otherwise, retain the QC split samples for 14 calendar days and promptly deliver the department's split samples to the department at:

Regional Materials Laboratory
Attn: Paul Emmons
935 S. 60th Street
West Allis, Wisconsin 53214
Telephone: (414) 266-1158

Retain and identify two representative samples of each Proctor. Submit one sample to the engineer. Retain one sample on site for use when performing textural identification.

B.6 Quality Control Documentation

B.6.1 Control Charts

Maintain separate control charts for the field density and field moisture content of each grading area. Designate grading areas within the project as follows:

1. Embankment portions of the project, except within 200 feet of bridge abutments.
2. Embankment within 200 feet of bridge abutments.
3. Subgrade cut portions of the project.
4. Embankment in pipe removal, pipe culvert, sewer and waterline trenches.
5. Structure and granular backfill placed at bridge abutments.
6. Embankments of the project where embankments are 20 feet or higher regardless of location to be known as special compaction area.

Ensure that all tests are recorded and become part of the project records. Plot required test results on the control charts. Include random and engineer-requested testing but only include the contractor's randomly selected QC test results in the 4-point running average. The contractor may plot other contractor-performed process control or informational tests on the control charts, but do not include them in 4-point running averages.

Post control charts in an engineer-approved location and update daily. Ensure that the control charts include the project number, the test number, each test element, the applicable control limits, the contractor's individual test results, the running average of the

last 4 data points, and the engineer's quality verification test data points. Use the control charts as part of a process control system for identifying potential problems and assignable causes. Format control charts according to the CMM.

Submit control charts to the engineer in a neat and orderly manner within 10 business days after completing subgrade construction.

B.6.2 Records

Document all observations, inspection records, adjustments to fill placement procedures, soil changes, and test results daily. Note the results of the observations and inspection records as they occur in a permanent field record. Density test locations shall be identified by a specific test number and include horizontal and vertical control for reference as noted in Section B.7.1.

Provide copies of the field density and field moisture running average calculation sheets, the one-point Proctor tests, records of procedure adjustments, and soil changes to the engineer daily.

Submit original testing records to the engineer in a neat and orderly manner within 10 business days after completing subgrade construction.

B.7 Contractor Testing

B.7.1 General

Have a grading technician certified under HTCP at level I (or ACT Grading Technician under the direction of a certified technician) present during all subgrade preparation, fill placement, compaction, and testing. Have a nuclear density technician certified under HTCP at level I perform the testing for field density and field moisture content. During subgrade construction, use sampling and testing methods identified in the CMM to perform the required tests at randomly selected locations at the indicated minimum frequency for each grading area.

Determine the cubic yards for testing based on a total load count system the engineer and contractor agree to.

For each test, provide the cubic yards represented and the test location to within 2 feet horizontally and 0.5 feet vertically. Use project stationing to determine horizontal location and grade stakes to determine vertical location. Elevations must be referenced to NAV88 datum.

Test areas of suspect compaction or areas which appear to be nonconforming as determined by the engineer.

B.7.2 Field Density and Field Moisture

Perform the field density and field moisture tests using the nuclear density meter method according to AASHTO T 310. Ensure that each field density test material is related to one of the specific soil types identified in the soil source study in determining the percent

compaction. Use textural identification as the primary method of establishing this relationship. Utilize the representative samples retained from the soil source study when performing the textural identification. Use a coarse particle correction according to AASHTO T 224.

If field density and field moisture tests cannot be performed by the nuclear density method due to a high percentage of oversized particles as determined according to AASHTO T 99 for highway embankments, observe the placement of the embankment and document the basis of acceptance. Document daily quantities of untested embankment and locations where untested embankment is placed, and keep a cumulative quantity of untested embankment material for the duration of the project. Include the daily documentation and a summary of the cumulative quantity of untested embankment material with the project records.

B.7.3 One-Point Proctor

Obtain a representative sample of the fill material and test according to AASHTO T 272. Compare the sample to the curves developed in the soils source study to determine the maximum dry density and optimum moisture. Use the appendix for AASHTO T 272 as a guide in this determination.

B.7.4 Testing Frequency

B.7.4.1 Subgrade Embankment portions of the project, except within 200 Feet of bridge abutments

Perform the required tests at the following frequencies:

Test	Minimum Frequency
Field Density and Moisture (AASHTO T 310)	One per 2,000 cubic yards of fill per lift or one test per grading area per day whichever yields the most tests.
One-Point Proctor (AASHTO T 272)	One per 9,000 cubic yards or when a change in fill material occurs.

B.7.4.2 Subgrade Embankment Within 200 Feet of Bridge Abutments

Perform the required tests at the following frequencies:

Test	Minimum Frequency
Field Density and Moisture (AASHTO T 310)	One per 1,000 cubic yards of fill per lift or one test per grading area per day whichever yields the most tests.
One-Point Proctor (AASHTO T 272)	One per 9,000 cubic yards or when a change in fill material occurs.

B.7.4.3 Subgrade Cut

Perform the required tests at the following frequencies:

Test	Minimum Frequency
Field Density and Moisture (AASHTO T 310)	One test per 1,000 linear feet of cut or one test per cut area whichever yields the most tests. The testing will be completed at the finished subgrade elevation.

B.7.4.4 Subgrade Embankment in Pipe Removals, Pipe Culvert, Sewer and Waterline Trenches

Perform the required tests at the following minimum frequencies per trench run between structures. Test trenches individually at the frequency listed below. For example, lateral lines and trunk lines are to be considered individual trenches:

Test	Minimum Frequency
Field Density and Moisture (AASHTO T 310)	One test per 100 CY of backfill placed per lift or one test per day whichever yields the most tests.
One-Point Proctor (AASHTO T 272)	One per 3,000 cubic yards or when a change in fill material occurs.

B.7.4.5 Structure and Granular Backfill at Bridge Abutments

Perform the required tests at the following minimum frequencies:

Test	Minimum Frequency
Field Density and Moisture (AASHTO T 310)	One test per 2 feet of vertical backfill height per abutment.
One-Point Proctor (AASHTO T 272)	One per 3,000 cubic yards or when a change in fill material occurs.

B.7.4.6 Embankments of the project 20 feet or higher regardless of location to be known as special compaction area

Perform the required tests at the following minimum frequencies but exclude MSE wall backfill:

Test	Minimum Frequency
Field Density and Moisture (AASHTO T 310)	One per 2,000 cubic yards of fill per lift or one test per grading area per day whichever yields the most tests.
One-Point Proctor (AASHTO T 272)	One per 6,000 cubic yards or when a change in fill material occurs.

B.7.5 Compaction Zones

B.7.5.1 Subgrade Embankment portions of the project, except within 200 Feet of Bridge Abutments

Embankment material placed within 6 feet of the finished subgrade elevation is classified as upper zone material. Material placed more than 6 feet below the finished subgrade elevation is classified as lower zone material.

B.7.5.2 Subgrade Embankment Within 200 Feet of Bridge Abutments

All embankment material placed within 200 feet of bridge abutments is subject to the quality controls for upper zone material.

B.7.5.3 Subgrade Cut

Subgrade material in cut areas is subject to the quality controls for upper zone material.

B.7.5.4 Subgrade Embankment in Pipe Removal and Culvert Pipe Trenches

Material placed within pipe removal and culvert pipe trenches are subject to the quality controls for the zone that the material is located in.

B.7.5.5 Structure and Granular Backfill at Bridge Abutments

All backfill material placed adjacent to bridge abutments is subject to the quality controls for upper zone material.

B.7.5.6 Embankments of the project 20 feet or higher regardless of zone to be known as special compaction area

All embankment material placed where embankments are 20 feet or higher regardless of zone is subject to the quality controls for upper zone material. Exclude MSE wall backfill.

For this contract, the station ranges where embankments are 20 feet or higher and require higher levels of compaction (special compaction) are as follows:

Station 221NS+50 to Station 228NS+43
Station 279NS+70 to Station 279NS+76
Station 289NS+20 to Station 289NS+50
Station 290NS+65 to Station 291NS+50
Station 296NS+10 to Station 296NS+60
Station 297NS+50 to Station 298NS+00
Station 570SW+25 to Station 571SW+15
Station 576SW+73 to Station 579SW+56
Station 596SW+91 to Station 597SW+50
Station 477NW+09 to Station 478NW+50
Station 480NW+75 to Station 487NW+00
Station 488NW+10 to Station 494NW+55
Station 234EW+00 to Station 236EW+66
Station 238EW+37 to Station 247EW+00
Station 531NE+50 to Station 532EW+51
Station 535NE+92 to Station 537NE+85
Station 524EN+86 to Station 529EN+43

Also see plan notes identifying special compaction.

B.7.6 Control Limits
B.7.6.1 Field Density
B.7.6.1.1 General Conditions
The lower control limit for field density measurements in the upper zone is a minimum of 95.0% of the maximum dry density as determined by AASHTO T 99 or T 272 for the 4-point running average and a minimum of 92.0% of the maximum dry density for any individual test.

The lower control limit for field density measurements in the lower zone is a minimum of 93.0% of the maximum dry density as determined by AASHTO T 99 or T 272 for the 4-point running average and a minimum of 90.0% of the maximum dry density for any individual test.

B.7.6.1.2 Embankments of the project 20 feet or higher regardless of zone to be known as special compaction area excluding MSE wall backfill
The lower control limit for field density measurements in the special compaction area is a minimum of 98.0% of the maximum dry density as determined by AASHTO T 99 or T 272 for the 4-point running average and a minimum of 95.0% of the maximum dry density for any individual test.

B B.7.6.2 Field Moisture Content
B.7.6.2.1 General Conditions
The upper control limit for the field moisture content in the upper and lower zones is 105.0% of the optimum moisture as determined by AASHTO T 99 or T 272 for the 4-point running average.

The lower control limit for the field moisture content in the upper and lower zones is 65.0% of the determined optimum moisture for the 4-point running average. There is no lower control limit for the field moisture of material having less than 5% passing the No. 200 sieve.

B.7.6.2.2 Embankments of the project 20 feet or higher regardless of zone to be known as special compaction area excluding MSE wall backfill
The upper control limit for the field moisture content in the special compaction area is 105.0% of the optimum moisture as determined by AASHTO T 99 or T 272 for the 4-point running average. The lower control limit for the field moisture content in the special compaction area is 90% of the determined optimum moisture for the 4-point running average.

B.7.6.2.3 Winter Conditions
If the critical path of the project schedule requires grading activities between November 15 and May 1, the upper control limit for soil moisture content may be raised to 110 percent of the optimum moisture content. This specification change may be applied to lower zone

material and upper zone material greater than 5 feet below finished subgrade if weather conditions do not allow for standard drying procedures (discing, aerating, etc.) and if approved by the engineer. The upper soil moisture control limit for embankments supporting MSE walls may not be raised. The engineer may allow the higher moisture content specification outside of the aforementioned dates if dictated by schedule and soil and weather conditions.

A written request must be submitted to the department for approval of the higher specification limit for soil moisture content. The request must include the affected grading areas, start and finish dates of grading activities, and total float provided for the activities. Once approved, this change may be applied to the quality control program and should be reflected in the control charts and testing records."

B.7.7 Corrective Action

Notify the engineer if an individual field density test falls below the individual test control limit. The subgrade in this area is unacceptable. Perform corrective actions, acceptable to the engineer to improve the density of the subgrade material. After corrective action, perform a randomly located retest within the represented quantity to ensure that the material is acceptable. The field density tests, soil moisture content tests and soil stability must meet the requirements of this special provision for the fill to be considered acceptable.

Notify the engineer if the field density or field moisture running average point falls below the running average control limit for field density or outside the control limits for field moisture. The subgrade in this area is unacceptable. Perform corrective actions, acceptable to the engineer to improve the quality of the material represented by the running average point. Retest each corrected area at a new random location within its represented quantity and determine a new 4-point running average. If the new running average is not acceptable, perform further corrective actions and retest at new random locations.

If the contractor's control data is proven incorrect resulting in a field density or field moisture point falling below the control limit for field density or outside the control limits for field moisture, the subgrade is unacceptable. Employ the methods described above for unacceptable material.

B.8 Department Testing

B.8.1 General

The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all verification and independent assurance personnel for the project.

The department will provide field density and field moisture test results to the contractor on the day of testing. Test results from Proctor split samples will be provided to the contractor within 7 business days after the sample has been received by the department.

B.8.2 Verification Testing

The department will have an HTCP technician, or ACT under the direction of a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified for contractor testing personnel for each test being verified. The department will notify the contractor before testing so the contractor can observe QV testing.

The department will test field density and field moisture randomly at locations independent of the contractor's QC work. The department will use split samples for verification of Proctor testing. In all cases, the department will conduct the verification tests in a separate laboratory and with separate equipment from the contractor's QC tests.

The department will perform verification testing as follows:

1. The department will conduct verification tests on Proctor split samples taken by the contractor. These samples may be from the Soil Source Study or the one-point Proctor or sample locations chosen by the engineer from anywhere in the process. The minimum verification testing frequency is one per 90,000 cubic yards, with at least one for each soil type identified in the Soil Source Study.
2. The department will test the first split sample obtained by the contractor for the one-point Proctor. The engineer may select any contractor-retained sample for verification testing.
3. The department will conduct at least one verification test for field density and field moisture per 20,000 cubic yards.

Plot verification tests on the contractor's quality control charts as specified in B.6.1. Do not include verification tests in the 4-point running average.

If verification tests are within specified control limits, no further action is required. If verification tests are not within specified control limits, the engineer and contractor will jointly investigate any testing discrepancies. The investigation may include additional testing as well as review and observation of both the department's and contractor's sampling and testing procedures and equipment. Both parties will document all investigative work.

Correct all deficiencies. If the contractor does not respond to an engineer request to correct a deficiency or resolve a testing discrepancy, the engineer may suspend grading work until action is taken. Resolve disputes as specified in B.9.

B.8.3 Independent Assurance Testing

Independent assurance is unbiased testing the department performs to evaluate the department's verification and the contractor's QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform the independent assurance review according to the department's independent assurance program, which may include one or more of the following:

1. Split sample testing.
2. Proficiency sample testing.
3. Witnessing sampling and testing.
4. Test equipment calibration checks.
5. Reviewing required worksheets and control charts.
6. Requesting that testing personnel perform additional sampling and testing.

Plot the independent assurance tests on the contractor's quality control charts as specified in B.6.1. Do not include independent assurance tests in the 4-point running average.

If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend grading work until action is taken. Resolve disputes as specified in B.9.

B.9 Dispute Resolution

The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.

If the project personnel cannot resolve a dispute and the dispute affects payment or could result in incorporating nonconforming product, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party tests to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

B.10 Acceptance

The department will accept the material tested under this provision based on the contractor QC tests unless it is shown through verification testing or the dispute resolution process that the contractor's test results are in error.

C (Vacant)

D (Vacant)

E Payment

Costs for furnishing all sampling, testing, and documentation required under this special provision are incidental to the work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor's pay. The

department will administer pay reduction under the non-performance of QMP administrative item.

68. Backfill Controlled Low Strength, Item 209.0200.S.

A Description

This special provision describes furnishing and placing a controlled low strength material designed for use as backfill in trenches for culverts, sewers, utilities, or similar structures, as backfill behind bridges abutments, or as fill for the abandonment of culverts, pipes, or tanks.

B Materials

Provide controlled low strength backfill that consists of a designed cementitious mixture of natural or processed materials. Allowable materials include natural sand, natural gravel, produced sand, foundry sand, produced gravel, fly ash, Portland cement, and other broken or fragmented mineral materials. The designed mixture shall be self-leveling and shall be free of shrinkage after hardening. Design the mixture to reach a state of hardening such that it can support foot traffic in no more than 24 hours. Provide a mixture that also meets the following requirements.

Test	Method	Value
Flow (inch)	ASTM D-6103	9 min
Compressive Strength (psi)	ASTM D-6024	20-40 @ 14 days 40-80 @ 28 days 80-120 @ 90 days

Chemical admixtures to control air content and setting time are allowable. Ten days prior to placement, furnish the engineer with a design mix detailing all components and their proportions in the mix. Also, provide documentation from the supplier of the industrial byproducts that the foundry sand and fly ash used in the mixture meet the requirements for Industrial Byproducts Categories 1, 2, 3, or 4 in NR 538 of the Wisconsin Administrative Code for use as a confined geotechnical fill.

C Construction

Place controlled low strength backfill at the locations and to the lines and grades as shown on the plan. Proportion and mix materials to produce a product of consistent texture and flow characteristics. The engineer may reject any materials exhibiting a substantial change in properties, appearance, or composition.

If the official Weather Bureau forecast for the construction site predicts temperatures at or below freezing within the next 24 hours after placement of controlled low strength backfill, protect the placed materials from freezing during that time period. If the temperature is not forecast to rise above 40º F for 72 hours after placement, the engineer may require protection from freezing for up to 72 hours.

No controlled low strength backfill shall be allowed to enter any stream, lake, or sewer system. The contractor shall be responsible for any clean up or remediation costs resulting from such occurrences.

D Measurement

The department will measure Backfill Controlled Low Strength in volume by the cubic yard of material placed and accepted. Such volume shall be computed from actual measurements of the dimensions of the area to be backfilled. In irregular or inaccessible areas, the engineer may allow volume to be determined by other appropriate methods.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
209.0200.S	Backfill Controlled Low Strength	CY

Payment is full compensation for designing the mix; supplying all materials; preparing the proportioned mix; hauling it to the construction site; placing the material; and protecting it from freezing.

209-010 (20090901)

69. QMP Base Aggregate.

A Description

A.1 General

(1) This special provision describes contractor quality control (QC) sampling and testing for base aggregates, documenting those test results, and documenting related production and placement process changes. This special provision also describes department quality verification (QV), independent assurance (IA), and dispute resolution.

(2) Conform to standard spec 301, standard spec 305, and standard spec 310 as modified here in this special provision. Apply this special provision to material placed under all of the Base Aggregate Dense and Base Aggregate Open Graded bid items, except do not apply this special provision to material classified as reclaimed asphaltic pavement placed under the Base Aggregate Dense bid items.

(3) Do not apply this special provision to material placed under the Aggregate Detours, Salvaged Asphaltic Pavement Base, Breaker Run, Select Crushed, Pit Run, Subbase, or Riprap bid items.

(4) Provide and maintain a quality control program, defined as all activities related to and documentation of the following:

1. Production and placement control and inspection.
2. Material sampling and testing.

(5) Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes required sampling and testing procedures. The contractor may obtain the CMM from the department's web site at:

http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm

A.2 Contractor Testing for Small Quantities

(1) The department defines a small quantity, for each individual Base Aggregate bid item, as a plan quantity of 9000 tons or less of material as shown in the schedule of items under that bid item.

(2) The requirements under this special provision apply equally to a small quantity for an individual bid item except as follows:

1. The contractor need not submit a full quality control plan but shall provide an organizational chart to the engineer including names, telephone numbers, and current certifications of all persons involved in the quality control program for material under affected bid items.
2. Divide the aggregate into uniformly sized sublots for testing as follows:

Plan Quantity	Minimum Required Testing
≤ 1500 tons	One test from production, load-out, or placement at the contractor's option[1]
> 1500 tons and ≤ 6000 tons	Two tests of the same type, either from production, load-out, or placement at the contractor's option[1]
> 6000 tons and ≤ 9000 tons	Three placement tests[2] [3]

[1] If using production tests for acceptance, submit test results to the engineer for review prior to incorporating the material into the work. Production test results are valid for a period of 3 years.

[2] For 3-inch material, obtain samples at load-out.

[3] If the actual quantity overruns 9000 tons, create overrun sublots to test at a rate of one additional placement test for each 3000 tons, or fraction of 3000 tons, of overrun.

3. No control charts are required. Submit aggregate load-out and placement test results to the engineer within one business day of obtaining the sample. Assure that all properties are within the limits specified for each test.
4. Department verification testing is optional for quantities of 6000 tons or less.

(3) Material represented by a sublot with any property outside the specification limits is nonconforming. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

B Materials

B.1 Quality Control Plan

(1) Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not place base before the engineer reviews and comments on the plan. Construct the project as that plan provides.

(2) Do not change the quality control plan without the engineer's review. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in each of the contractor's laboratories as changes are adopted. Ensure that the plan provides the following elements:

1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication means that will be used, and action time frames.
3. A list of source and processing locations, section and quarter descriptions, for all aggregate materials requiring QC testing.
4. Test results for wear, sodium sulfate soundness, freeze/thaw soundness, and plasticity index of all aggregates requiring QC testing. Obtain this information from the region materials unit or from the engineer.
5. Descriptions of stockpiling and hauling methods.
6. Locations of the QC laboratory, retained sample storage, and where control charts and other documentation is posted.
7. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.

B.2 Personnel

(1) Have personnel certified under the department's highway technician certification program (HTCP) perform sampling, testing, and documentation as follows:

Required Certification Level:	Sampling or Testing Roles:
Aggregate Technician IPP Aggregate Sampling Technician Aggregate Assistant Certified Technician (ACT-AGG)	Aggregate Sampling[1]
Aggregate Technician IPP Aggregate Assistant Certified Technician (ACT-AGG)	Aggregate Gradation Testing, Aggregate Fractured Particle Testing, Aggregate Liquid Limit and Plasticity Index Testing

[1] Plant personnel under the direct observation of an aggregate technician certified at level one or higher may operate equipment to obtain samples.

(2) A certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

B.3 Laboratory

(1) Perform QC testing at a department-qualified laboratory. Obtain information on the Wisconsin laboratory qualification program from:

Materials Management Section
3502 Kinsman Blvd.
Madison, WI 53704
Telephone: (608) 246-5388
http://www.dot.state.wi.us/business/engrserv/lab-qualification.htm

B.4 Quality Control Documentation

B.4.1 General

(1) Submit base aggregate placement documentation to the engineer within 10 business days after completing base placement. Ensure that the submittal is complete, neatly organized, and includes applicable project records and control charts.

B.4.2 Records

(1) Document all placement observations, inspection records, and control adjustments daily in a permanent field record. Also include all test results in the project records. Provide test results to the engineer within 6 hours after obtaining a sample. For 3-inch base, extend this 6-hour limit to 24 hours. Post or distribute tabulated results using a method mutually agreeable to the engineer and contractor.

B.4.3 Control Charts

(1) Plot gradation and fracture on the appropriate control chart as soon as test results are available. Format control charts according to CMM 8.30. Include the project number on base placement control charts. Maintain separate control charts for each base aggregate size, source or classification, and type.

(2) Provide control charts to the engineer within 6 hours after obtaining a sample. For 3-inch base, extend this 6-hour limit to 24 hours. Post or distribute charts using a method mutually agreeable to the engineer and contractor. Update control charts daily to include the following:

1. Contractor individual QC tests.
2. Department QV tests.
3. Department IA tests.
4. Four-point running average of the QC tests.

(3) Except as specified under B.8.2.1 for nonconforming QV tests, include only QC tests in the running average. The contractor may plot process control or informational tests on control charts, but do not include these tests, conforming QV tests, or IA tests in the running average.

B.5 Contractor Testing

(1) Test gradation, fracture, liquid limit and plasticity index during placement for each base aggregate size, source or classification, and type.

(2) Test gradation once per 3000 tons of material placed. Determine random sample locations and provide those sample locations to the engineer. Obtain samples after the material has been bladed, mixed, and shaped but before compacting; except collect

3-inch samples from the stockpile at load-out. Do not sample from material used to maintain local traffic or from areas of temporary base that will not have an overlying pavement. On days when placing only material used to maintain local traffic or only temporary base that will not have an overlying pavement, no placement testing is required.

(3) Split each contractor QC sample and identify it according to CMM 8.30. Retain the split for 7 calendar days in a dry, protected location. If requested for department comparison testing, deliver the split to the engineer within one business day.

(4) The engineer may require additional sampling and testing to evaluate suspect material or the technician's sampling and testing procedures.

(5) Test fracture for each gradation test until the fracture running average is above the lower warning limit. Subsequently, the contractor may reduce the frequency to one test per 10 gradation tests if the fracture running average remains above the warning limit.

(6) Test the liquid limit and plasticity index for the first gradation test. Subsequently, test the liquid limit and plasticity index a minimum of once per 10 gradation tests.

B.6 Test Methods

B.6.1 Gradation

(1) Test gradation using a washed analysis conforming to the following as modified in CMM 8.60:

Gradation..... AASHTO T 27
Material finer than the No. 200 sieve..... AASHTO T 11

(2) For 3-inch base, if 3 consecutive running average points for the percent passing the No. 200 sieve are 8.5 percent or less, the contractor may use an unwashed analysis. Wash at least one sample out of 10. If a single running average for the percent passing the No. 200 sieve exceeds 8.5 percent, resume washed analyses until 3 consecutive running average points are again 8.5 percent passing or less.

(3) Maintain a separate control chart for each sieve size specified in standard spec 305 or standard spec 310 for each base aggregate size, source or classification, and type. Set control and warning limits based on the standard specification gradation limits as follows:

1. Control limits are at the upper and lower specification limits.
2. There are no upper warning limits for sieves allowing 100 percent passing and no lower control limits for sieves allowing 0 percent passing.
3. Dense graded warning limits, except for the No. 200 sieve, are 2 percent within the upper and lower control limits. Warning limits for the No. 200 sieve are set 0.5 percent within the upper and lower control limits.
4. Open graded warning limits for the 1-inch, 3/8-inch, and No. 4 sieves are 2 percent within the upper and lower control limits. Upper warning limits for the No. 10, No. 40, and No. 200 sieves are 1 percent inside the upper control limit.

B.6.2 Fracture

(1) Test fracture conforming to CMM 8.60. The engineer will waive fractured particle testing on quarried stone.

(2) Maintain a separate fracture control chart for each base aggregate size, source or classification, and type. Set the lower control limit at the contract specification limit, either specified in another special provision or in table 301-2 of standard spec 301.2.4.5. Set the lower warning limit 2 percent above the lower control limit. There are no upper limits.

B.6.3 Liquid Limit and Plasticity

(1) Test the liquid limit and plasticity according to AASHTO T 89 and T 90.

(2) Ensure the material conforms to the limits specified in standard spec table 301-2.

B.7 Corrective Action

B.7.1 General

(1) Consider corrective action when the running average trends toward a warning limit. Take corrective action if an individual test exceeds the contract specification limit. Document all corrective actions both in the project records and on the appropriate control chart.

B.7.2 Placement Corrective Action

(1) Do not blend additional material on the roadbed to correct gradation problems.

(2) Notify the engineer whenever the running average exceeds a warning limit. When 2 consecutive running averages exceed a warning limit, the engineer and contractor will discuss appropriate corrective action. Perform the engineer's recommended corrective action and increase the testing frequency as follows:

1. For gradation, increase the QC testing frequency to at least one randomly sampled test per 1000 tons placed.
2. For fracture, increase the QC testing frequency to at least one test per gradation test.

(3) If corrective action improves the property in question such that the running average after 4 additional tests is within the warning limits, the contractor may return to the testing frequency specified in B.5.3. If corrective action does not improve the property in question such that the running average after 4 additional individual tests is still in the warning band, repeat the steps outlined above starting with engineer notification.

(4) If the running average exceeds a control limit, material starting from the first running average exceeding the control limit and ending at the first subsequent running average inside the control limit is nonconforming and subject to pay reduction.

(5) For individual test results significantly outside the control limits, notify the engineer, stop placing base, and suspend other activities that may affect the area in question. The engineer and contractor will jointly review data, data reduction, and data analysis; evaluate sampling and testing procedures; and perform additional testing as required to determine the extent of potentially unacceptable material. The engineer may direct the contractor to remove and replace that material. Individual test results are significantly outside the control limits if meeting one or more of the following criteria:

1. A gradation control limit for the No. 200 sieve is exceeded by more than 3.0 percent.
2. A gradation control limit for any sieve, except the No. 200, is exceeded by more than 5.0 percent.
3. The fracture control limit is exceeded by more than 10.0 percent.

B.8 Department Testing

B.8.1 General

(1) The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project, and provide test results to the contractor within 2 business days after the department obtains the sample.

B.8.2 Verification Testing

B.8.2.1 General

(1) The department will have an HTCP technician, or ACT working under a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in B.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.

(2) The department will conduct QV tests of each base aggregate size, source or classification, and type during placement conforming to the following:

1. One non-random test on the first day of placement.
2. At least one random test per 30,000 tons, or fraction of 30,000 tons, placed.

(3) The department will sample randomly, at locations independent of the contractor's QC work, collecting one sample at each QV location. The department will collect QV samples after the material has been bladed, mixed, and shaped but before compacting; except, for 3-inch aggregates, the department will collect samples from the stockpile at load-out. The department will split each sample, test half for QV, and retain half.

(4) The department will conduct QV tests in a separate laboratory and with separate equipment from the contractor's QC tests. The department will use the same methods specified for QC testing.

(5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to the specification, the department will take no further action. If QV test results are nonconforming, add the QV to the QC test results as if it were an additional QC test.

B.8.3 Independent Assurance

(1) Independence assurance is unbiased testing the department performs to evaluate the department's QV and the contractor's QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department's independent assurance program. That review may include one or more of the following:

1. Split sample testing.
2. Proficiency sample testing.
3. Witnessing sampling and testing.
4. Test equipment calibration checks.
5. Reviewing required worksheets and control charts.
6. Requesting that testing personnel perform additional sampling and testing.

(2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in B.9.

B.9 Dispute Resolution

(1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.

(2) Production test results, and results from other process control testing, may be considered when resolving a dispute.

(3) If the project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

C (Vacant)

D (Vacant)

E Payment

(1) Costs for all sampling, testing, and documentation required under this special provision are incidental to this work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor's pay. The department will administer pay reduction under the non-performance of QMP administrative item.

(2) For material represented by a running average exceeding a control limit, the department will reduce pay by 10 percent of the contract price for the affected Base Aggregate bid items listed in subsection A. The department will administer pay reduction under the Nonconforming QMP Base Aggregate Gradation or Nonconforming QMP Base Aggregate Fracture Administrative items. The department will determine the quantity of nonconforming material as specified in B.7.2.

301-010 (20100709)

70. Select Crushed Material.

Replace standard spec 312.2(6) with the following:

312.2 Materials

(6) The department will assess select crushed material acceptability based primarily on the engineer's visual inspection. The department may require contractor to sample, test and report gradation or fracture results to show conformance of material. One test per source, production process or change of production process may be required.

Replace standard spec 312.5(2) with the following:

312.5 Payment

(2) Payment for Select Crushed Material is full compensation for providing and compacting select crushed material and all work necessary to provide gradation or fracture test results.

SEF Rev. 13_0430

71. Concrete Pavement Approach Slab.

When adjacent to Concrete Pavement 12-Inch Special, Concrete Pavement Approach Slabs on Zoo Interchange will require high performance dowel bars in accordance to the Special Provision Concrete Pavement 12-Inch Special.

72. Concrete Maturity Testing.

A Description

This special provision requires using concrete maturity testing to determine strength for project control of concrete pavement, falsework removal, and structural concrete under the designated standard specifications as follows:

Duration of the curing period	415.3.12
Duration of the cold weather protection period	415.3.13
Opening to service	415.3.15
Removing falsework	502.3.4.2
Duration of the required curing period	502.3.8
Duration of the cold weather protection period	502.3.9
Opening to service	502.3.10.1

The requirement for determining strength by the concrete maturity testing method supersedes all provisions for strength determination by other methods or provisions based on equivalent days within those designated subsections. The concrete maturity testing requirement also applies to all other provisions referencing strength determination under these designated subsections.

B Materials

Provide a maturity testing system that uses data-encrypted sensor devices permanently embedded in the field-placed concrete. Data-encrypted sensors have a chip that records both temperature and time information that can be downloaded to a reading device not permanently attached to those sensors.

Provide the department with a maturity reading device for each maturity testing system utilized on the project. Devices provided for the department use will become department property under the contract.

C Construction

Perform concrete maturity testing in accordance to standard spec 502.3.10.1.3.3. Develop a strength/maturity relationship for each concrete mix design used under the contract. Base that relationship on strength results of cylinders from pavement, appurtenant construction, ancillary concrete, or structural masonry units incorporated into the work and using those same mixes.

D (Vacant)

E Payment

No additional payment will be made by the department for maturity testing.

73. QMP Ride; Incentive IRI Ride, Item 440.4410.S.

A Description

(1) This special provision describes profiling pavements with a non-contact profiler, locating areas of localized roughness, and determining the International Roughness Index (IRI) for each wheel path segment.

(2) Profile the final riding surface of all mainline pavements**.** Include auxiliary lanes in Category I and II segments; crossroads with county, state or U.S. highway designations greater than 1500 feet in continuous length; bridges, bridge approaches; and railroad

crossings. Exclude roundabouts and pavements within 150 feet of the points of curvature of roundabout intersections.

(3) The engineer may direct straightedging under standard spec 415.3.10 for pavement excluded from localized roughness under C.5.2 (1); for bridges; and for roundabouts and pavements within 150 feet of the points of curvature of roundabout intersections. Other surfaces being tested under this provision are exempt from straightedging requirements.

B (Vacant)

C Construction

C.1 Quality Control Plan

(1) Submit a written quality control plan to the engineer at or before the pre-pave meeting. Ensure that the plan provides the following elements:

1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of all quality control personnel.
2. The process by which quality control information and corrective action efforts will be disseminated to the appropriate persons. Include a list of recipients, the communication means that will be used, and action time frames.
3. The methods and timing used for monitoring and/or testing ride quality throughout the paving process. Also indicate the approximate timing of acceptance testing in relation to the paving operations.
4. The segment locations of each profile run used for acceptance testing.
5. Traffic Control Plan

C.2 Personnel

(1) Have a profiler operator, certified under the department's highway technician certification program (HTCP), operate the equipment, collect the required data, and analyze the results using the methods taught in the HTCP profiling course. Ensure that an HTCP-certified profiler operator supervises data entry into the material records system (MRS).

C.3 Equipment

(1) Furnish a profile-measuring device capable of measuring IRI from the list of department-approved devices published on the department's web site:

http://roadwaystandards.dot.wi.gov/standards/qmp/index.htm

(2) Unless the engineer and contractor mutually agree otherwise, arrange to have a calibrated profiler available when paving the final riding surface.

(3) Perform daily calibration verification of the profiler using test methods according to the manufacturer's recommendations. Notify the engineer before performing the calibration verification. If the engineer requests, arrange to have the engineer observe the calibration verification and operation. Maintain records of the calibration verification activities, and provide the records to the engineer upon request.

C.4 Testing

C.4.1 Run and Reduction Parameters

(1) Enter the equipment-specific department-approved filter settings and parameters given in the approved profilers list on the department's QMP ride web site.

http://roadwaystandards.dot.wi.gov/standards/qmp/profilers.pdf

C.4.2 Contractor Testing

(1) Operate profilers within the manufacturer's recommended speed tolerances. Perform all profile runs in the direction of travel. Measure the longitudinal profile of each wheel track of each lane. The wheel tracks are 6.0 feet apart and centered in the traveled way of the lane.

(2) Coordinate with the engineer to schedule profile runs for acceptance. The department may require testing to accommodate staged construction or if corrective action may be required.

(3) Measure the profiles of each standard or partial segment. Define primary segments starting at a project terminus and running contiguously along the mainline to the other project terminus. Field-locate the beginning and ending points for each profile run. When applicable, align segment limits with the sublot limits used for testing under the QMP Concrete Pavement specification. Define segments one wheel path wide and distinguished by length as follows:

1. Standard segments are 500 feet long.
2. Partial segments are less than 500 feet long.

(4) Treat partial segments as independent segments.

The department will categorize each standard or partial segment as follows:

Segments with a Posted Speed Limit of 55 MPH or Greater	
Category	**Description**
HMA I	Asphalt pavement with multiple opportunities to achieve a smooth ride. The following operations performed under this contract are considered as opportunities: a layer of HMA, a leveling or wedging layer of HMA, and diamond grinding or partial depth milling of the underlying pavement surface.
HMA II	Asphalt pavement with a single opportunity to achieve a smooth ride.
HMA III	Asphalt pavement segments containing any portion of a bridge, bridge approach, railroad crossing, or intersection. An intersection is defined as the area within the points of curvature of the intersection radii.
PCC II	Concrete pavement.
PCC III	Concrete pavement segments containing any portion of a bridge, bridge approach, railroad crossing, intersection or gap. An intersection is defined as the area within the points of curvature of the intersection radii.

Segments with Any Portion Having a Posted Speed Limit Less Than 55 MPH	
Category	**Description**
HMA IV	Asphalt pavement including intersections, bridges, approaches, and railroad crossings.
PCC IV	Concrete pavement including gaps, intersections, bridges, approaches, and railroad crossings.

C.4.3 Verification Testing

(1) The department may conduct verification testing (QV) to validate the quality of the product. A HTCP certified profiler operator will perform the QV testing. The department will provide the contractor with a listing of the names and telephone numbers of all verification personnel for the project.

(2) The department will notify the contractor before testing so the contractor can observe the QV testing. Verification testing will be performed independent of the contractor's QC work using separate equipment from the contractor's QC tests. The department will provide test results to the contractor within 1 business day after the department completes the testing.

(3) The engineer and contractor will jointly investigate any testing discrepancies. The investigation may include additional testing as well as review and observation of both the department's and contractor's testing procedures and equipment. Both parties will document all investigative work.

(4) If the contractor does not respond to an engineer request to resolve a testing discrepancy, the engineer may suspend production until action is taken. Resolve disputes as specified in C.6.

C.4.4 Documenting Profile Runs

(1) Compute the IRI for each segment and analyze areas of localized roughness using the ProVAL software. Also, the contractor shall prepare the ProVAL Ride Quality Module Reports, showing the IRI for each segment and the areas of localized roughness exceeding an IRI of 200 in/mile. Use ride quality module report as follows:

	Fixed Interval	Continuous (Localized Roughness)
Base-length	500'	25'
Threshold	140"/Mile	200"/Mile

The ProVAL software is available for download at:
http://www.roadprofile.com.

(2) As part of the profiler software outputs and ProVAL reports, document the areas of localized roughness. Field-locate the areas of localized roughness prior to the engineer's assessment for corrective actions. Document the reasons for areas excluded and submit to the engineer.

(3) Within 5 business days after completing profiling of the pavement covered under this special provision, unless the engineer and contractor mutually agree to a different timeline, submit the electronic ProVAL project file containing the .ppf files for each profiler acceptance run data and Ride Quality Module Reports, in .pdf format using the department's Materials Reporting System (MRS) software available on the department's web site:

http://www.atwoodsystems.com/mrs

Notify the engineer when the Profiler Acceptance Run data and the Ride Quality Report have been submitted to the MRS system.

C.5 Corrective Actions

C.5.1 General

(1) Analyze the data from the PROVAL reports and make corrective action recommendations to the department. The department will independently assess whether a repair will help or hurt the long-term pavement performance before deciding on corrective action. Correct the ride as the engineer directs in writing.

C.5.2 Corrective Actions for Localized Roughness

(1) Apply localized roughness requirements to all pavements, including HMA III, PCC III, HMA IV, and PCC IV; except localized roughness requirements will not be applied to pavements within 25 feet of the following surfaces if they are not constructed under this contract: bridges, bridge approaches, or railroad crossings. The department may direct the contractor to make corrections to the pavement within the 25-foot exclusionary zones.

(2) The engineer will review each individual wheel track for areas of localized roughness. The engineer will assess areas of localized roughness within 5 business days of receiving notification that the reports were uploaded. The engineer will analyze the report documenting areas that exceed an IRI of 200 in/mile and do one of the following for each location:

1. Direct the contractor to correct the area to minimize the effect on the ride.
2. Leave the area of localized roughness in place with no pay reduction.
3. Except for HMA IV and PCC IV segments, assess a pay reduction as follows for each location in each wheel path:

Localized Roughness IRI (in/mile)	**Pay Reduction[1] (dollars)**
> 200	(Length in Feet) x (IRI –200)

[1] A maximum $250 pay reduction may be assessed for locations of localized roughness that are less than or equal to 25 feet long. Locations longer than 25 feet may be assessed a maximum pay reduction of $10 per foot.

(3) The engineer will not direct corrective action or assess a pay reduction for an area of localized roughness without independent identification of that area as determined by physically riding the pavement. For corrections, use only techniques the engineer approves.

(4) Re-profile corrected areas to verify that the IRI is less than 140 in/mile after correction. Submit a revised ProVAL ride quality module report to the reference documents section of the MRS for the corrected areas to validate the results.

C.5.3 Corrective Actions for Excessive IRI

(1) If an individual segment IRI exceeds 140 in/mile for HMA I, HMA II, and PCC II pavements after correction for localized roughness, the engineer may require the contractor to correct that segment. Correct the segment final surface as follows:

HMA I:	Correct to an IRI of 60 in/mile using whichever of the following methods as approved by the engineer: Mill and replace the full lane width of the riding surface excluding the paved shoulder. Continuous diamond grinding or fine-tooth milling the full lane width, if required, of the riding surface including adjustment of the paved shoulders.
HMA II:	Correct to an IRI of 85 in/mile using whichever of the following methods as approved by the engineer: Mill and replace the full lane width of the riding surface excluding the paved shoulder. Continuous diamond grinding or fine-tooth milling of the full lane width, if required, of the riding surface including adjustment of the paved shoulders
PCC II:	Correct to an IRI of 85 in/mile using whichever of the following methods as approved by the engineer: Continuous diamond grinding of the full lane width, if required, of the riding surface including adjustment of the paved shoulders. Conform to sections C.1 through C.4 of Concrete Pavement Continuous Diamond Grinding Special provision contained elsewhere in the contract. Remove and replace the full lane width of the riding surface.

(2) Re-profile corrected segments to verify that the final IRI meets the above correction limits and there are no areas of localized roughness. Enter a revised ProVAL ride quality module report for the corrected areas to the reference documents section of the MRS. Segments failing these criteria after correction are subject to the engineer's right to adjust pay for non-conforming work under standard spec 105.3.

C.6 Dispute Resolution

(1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate testing procedures, and perform additional testing.

(2) If the project personnel cannot resolve a dispute and the dispute affects payment or could result in incorporating nonconforming pavement, the department will use third party testing to resolve the dispute. The department's Quality Assurance Unit, or a mutually agreed on independent testing company, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent tester. The department may use third party tests to evaluate the quality of questionable pavement and determine the appropriate payment.

D Measurement

(1) The department will measure Incentive IRI Ride by the dollar, adjusted as specified in E.2.

E Payment

E.1 Payment for Profiling

(1) Costs for furnishing and operating the profiler, documenting profile results, and correcting the final pavement surface are incidental to the contract. The department will pay separately for engineer-directed corrective action performed within the 25-foot exclusionary zones under C.5.2 as extra work.

E.2 Pay Adjustment

(1) The department will pay incentive for ride under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
440.4410.S	Incentive IRI Ride	DOL

(2) Incentive payment is not limited, either up or down, to the amount the schedule of items shows.

(3) The department will administer disincentives for ride under the Disincentive IRI Ride administrative item.

(4) The department will not assess disincentive on HMA III or PCC III segments. Incentive pay for HMA III and PCC III segments will be according to the requirements for the category of the adjoining segments.

(5) The department will adjust pay for each segment based on the initial IRI for that segment. If corrective action is required, the department will base disincentives on the IRI after correction for pavement meeting the following conditions:

All Pavement:	The corrective work is performed in a contiguous, full lane width section 500 feet long, or a length as agreed with the engineer.
HMA Pavements:	The corrective work is a mill and inlay or full depth replacement and the inlay or replacement layer thickness conforms to standard spec 460.3.2.
Concrete Pavements:	The corrective work is a full depth replacement and conforms to standard spec 415.

(6) The department will adjust pay for 500-foot long standard segments nominally one wheel path wide using equation "QMP 1.04" as follows:

HMA I	
Initial IRI (inches/mile)	**Pay Adjustment[1] (dollars per standard segment)**
< 30	250
≥ 30 to <35	1750 – (50 x IRI)
≥ 35 to < 60	0
≥ 60 to < 75	1000 – (50/3 x IRI)
≥ 75	-250

HMA II and PCC II	
Initial IRI (inches/mile)	**Pay Adjustment[1] [2] (dollars per standard segment)**
< 50	250
≥ 50 to < 55	2750 – (50 x IRI)
≥ 55 to < 85	0
≥ 85 to < 100	(4250/3) – (50/3 x IRI)
≥ 100	-250

HMA IV and PCC IV	
Initial IRI (inches/mile)	**Pay Adjustment[1] [2] (dollars per standard segment)**
< 35	250
≥ 35 to < 45	1125-(25xIRI)
≥ 45	0

[1] If the engineer directs placing upper layer asphaltic mixtures between October 15 and May 1 for department convenience as specified in standard spec 450.3.2.1(5), the department will not adjust pay for ride on pavement the department orders the contractor to place when the temperature, as defined in standard spec 450.3.2.1(2), is less than 36 F.

[2] If the engineer directs placing concrete pavement for department convenience, the department will not adjust pay for ride on pavement the department orders the contractor to place when the air temperature falls below 35 F.

(7) The department will prorate the pay adjustment for partial segments based on their length.

440-010 (20130615)

74. Asphaltic Surface Temporary.

Replace standard spec 465.2 (1) with the following:

Under the Asphaltic Surface Temporary bid item; submit a mix design. Furnish asphaltic mixture meeting the requirements specified for type E-10 under standard spec 460.2; except the engineer will not require the contractor to conform to the quality management program specified under standard spec 460.2.8.

75. Expansion Device, B-40-852.

A Description

This special provision describes furnishing and installing an expansion device in accordance to standard spec 502, as shown on the plans, and as hereinafter provided.

B Materials

The minimum thickness of the polychloroprene strip seal shall be ¼-inch for non-reinforced elastomeric glands and 1/8-inch for reinforced glands. Furnish the strip seal gland in lengths suitable for a continuous one-piece installation at each individual expansion joint location. Provide preformed polychloroprene strip seals that conform to the requirements ASTM D3542, and have the following physical properties:

Property Requirements	Value	Test Method
Tensile Strength, min.	2000 psi	ASTM D412
Elongation @ Break, min	250%	ASTM D412
Hardness, Type A, Durometer	60 ± 5 pts.	ASTM D2240
Compression Set, 70 hours @212˚F, max.	35%	D395 Method B Modified
Ozone Resistance, after 70 hrs. at 100˚F under 20% Strain with 100 pphm ozone	No Cracks	ASTM D1149 Method A
Mass Change in Oil 3 after 70 hr. 212˚F Mass Change, max.	45%	ASTM D471

Install the elastomeric strip seal gland with tools recommended by the manufacturer, and with a lubricant adhesive conforming to the requirements of ASTM D4070.

The manufacturer and model number shall be one of the following approved strip seal expansion device products:

Manufacturer	Model Number Strip Seal Gland Size* 4-Inch	5-Inch	6-Inch
D.S. Brown	SSA2-A2R-400	SSA2-A2R-XTRA	SSA2-A2R-XTRA
R.J. Watson	RJA-RJ400	RJA-RJ500	RJA-RJ600
Watson Bowman Acme	A-SE400	A-SE500	A-SE800
Commercial Fabricators	A-AS400	-----	-----

*Expansion device strip seal gland size requirement of 4", 5", and 6" shall be as shown on the plans.

Furnish manufacturer's certification for production of polychloroprene represented showing test results for the cured material supplied, and certifying that it meets all specified requirements.

The steel extrusion or retainer shall conform to ASTM designation A 709 grade 36 steel. After fabrication, steel shall be galvanized conforming to the requirements ASTM A123.

Manufacturer's certifications for adhesive and steel shall attest that the materials meet the specification requirements.
502-020 (20110615)

76. Concrete Masonry Structures.

A Description
A.1 General
Work under this item applies to cast in place concrete for structures. Conform to standard specs 501, 502, 504, 701, 710 and 715 and as modified in this special provision. Apply this special provision to all cast in place concrete placed under the following bid items:

502.0100	Concrete Masonry Bridges
502.0200	Concrete Masonry Bridges HES
502.1100	Concrete Masonry Seal
504.0100	Concrete Masonry Culverts
504.0200	Concrete Masonry Culverts HES
504.0500	Concrete Masonry Retaining Walls
504.0600	Concrete Masonry Retaining Walls HES
504.0900	Concrete Masonry Endwalls
SPV.0035.4010	Concrete Masonry Soldier Pile Footings

A.2 Concrete Masonry Bridges
Work under the item Concrete Masonry Bridges applies to cast in place concrete for bridge substructures, which includes abutments and piers. Cast in place concrete for bridge superstructures, which includes bridge decks, raised medians, sidewalks, and parapets, is covered under the special provision item HPC Masonry Structures.

B (Vacant)

C Construction
Replace standard spec 501.3.8.2 with the following:

The contractor is responsible for the quality of the concrete placed in hot weather. Submit a written temperature control plan at or before the pre-pour meeting. In that plan, outline the actions taken to control concrete temperature if the concrete temperature at the point of placement exceeds 80° F (27° C). Do not place concrete without the engineer's written acceptance of that temperature control plan. Perform the work as outlined in the temperature control plan.

If the concrete temperature at the point of placement exceeds 90° F (32° C), do not place concrete under the following bid items:

Concrete Masonry Bridges
Concrete Masonry Bridges HES
Concrete Masonry Retaining Walls
Concrete Masonry Retaining Walls HES
Concrete Masonry Culverts
Concrete Masonry Culverts HES
Concrete Masonry Endwalls
Concrete Masonry Soldier Pile Footings

Notify the engineer whenever conditions exist that might cause the temperature at the point of placement to exceed 80º F (27º C). If project information is not available, obtain information from similar mixes placed for other nearby work.

Any additive or action taken to control the temperature of the Concrete Masonry to within the limits of this special provision, including but not limited to the addition of ice to the concrete mix, is considered incidental to the work and will not be measured or paid for separately.

Add the following standard spec 501.3.11 to the standard specifications:

501.3.11 Slip Forming
Do not place concrete by the slip-form method for any item covered by this special provision.

D (Vacant)

E (Vacant)

SEF Rev. 13_0807

77. Contact Grouting.

A Description

Contact grouting is to fill any remaining voids outside of the jacked pipe and outside of shaft excavation support system. This section covers the work necessary for contact grouting including furnishing, mixing and placing grout; furnishing all labor, materials, equipment, and incidentals; and all other related work necessary for grouting, complete.

B Materials

Contact grout shall consist of a mixture of water, sand and Portland cement, with mineral fillers or admixtures as necessary to achieve a non-shrink, non-bleed, flowable grout. The grout shall have a minimum 24-hour compressive strength of 75 and a minimum 28-day compressive strength of 250 psi.

Portland cement, water and fly ash shall conform to the requirements of standard spec 501.2. Use Type I Portland cement.

Sand shall conform to the requirements for concrete aggregates specified in Section 501.2.5, except that it shall have a fines modulus between 1.5 and 2.0 and be graded as specified in the following table.

Sieve Size	Percent Passing Minimum
No. 8	100
No. 16	95 – 100
No. 30	60 – 85
No. 50	20 – 50
No. 100	10 – 30
No. 200	0 – 5

Fluidifier shall be a compound with characteristics that will hold the solid constituents of the grout in colloidal suspension, be compatible with the cement and water used in the grout mix, and contain a shrinkage compensator. Fluidifier shall not contaminate the groundwater. Fluidifier shall be furnished in moisture resistant paper sacks shipped in sealed containers and shall be handled and stored so as to avoid absorption of moisture, damage or waste. Material which has become caked due to moisture absorption will be rejected.

Suitable stop valves shall be provided at the collar of the grout hole for use in maintaining pressure as required until the grout has set

C Construction

C.1 Submittals

C.1.1 General

Prepare and submit contact grout mix and contact grout work plan at least 21 calendar days prior to beginning grouting activities. The engineer will accept the submittal as

submitted or return the submittal with requested revisions. Do not start any grouting work until the engineer provides acceptance of contact grout mix and contact grout work plan. Acceptance of the submittals does not relieve the contractor of responsibility for successful completion of the tunnels.

C.1.2 Submittals for Approval

Contact Grout Mix:

a. Submit mix designs for each contact grout mix proposed for use. Resubmit as appropriate if the mixes are modified during the course of the work. Each mix design shall show the ingredients of the mix and shall include:
    i. Type, brand, source, and amounts of cement, admixtures, and other additives.
    ii. Source and amount of water.
    iii. Representative samples of materials for materials test and mix proportion testing.
    iv. Combined grading of each mix design.
    v. Specific gravity of all materials.
    vi. Results of required tests.
b. Submit material specifications and instructions for use of any proposed concrete admixtures.
c. Submit certificates of compliance for each load of Portland cement and fly ash (if used) which is in accordance to ASTM C618 and certificates of compliance for all admixtures. Supporting test data shall be furnished when requested by the engineer. All testing and sampling procedures shall be in accordance to ASTM C311.
d. Mill test reports for Portland cement.
e. Submit water quality test results.

Contact Grouting Work Plan: The work plan for placing contact grout shall cover each type of contact grouting required and shall include:

a. Contact grouting methods, procedures and sequences for each tunnel segment.
b. Grout hole locations and depth of injection ports.
c. Plans for grout port opening in advance of injection at a port and release of water disturbed soil or slurry.
d. Method of transporting grouting equipment, grout and materials into and within the tunnel.
e. Quantitative prediction of grout volumes required at each location, with consideration of volume of annular space due to difference between diameter excavated and outside diameter of initial support system or jacked pipe, ground loss volumes, soil stand-up time and diametrical closure.
f. Means for measuring grout takes (volume) per foot or segment of initial support system or pipe.
g. Means for measuring grout pressures and planned grout pressure limits for refusal criteria.
h. Timing of grout injection after completion of a drive for pipe jacking.

i. Contact Grouting Equipment: Manufacturer's specifications and operation instructions for grout conveyance equipment. Pump specifications. Grout hose, valve and port sizes and specifications. Grout pressure gages and pressure gauge calibration data.

C.1.3 Information Submittals

Contact Grouting Daily Records: Submit the following daily reports and records for jacked pipe contact grouting.

a. Daily logs of grouting operations at all contact grouting locations (station and position) of grout ports, including pressures, volumes, and grout mix pumped, times of injecting, locations where grout samples for test cylinders are taken, and grout slump results.
b. An analysis of overcut annulus volume at the time of grouting with consideration of soil stand-up time, diametrical closure and effects of injected bentonite slurry volumes. Provide a comparison of anticipated annulus volume with grout volume placed by contact grouting for each pipe.
c. Compressive strength tests reports from a certified testing laboratory.

C.1.4 Acceptance

The engineer will evaluate the Submittals for Approval with the requirements of this special provision. Within 14 calendar days after receipt of the Submittals of Approval, the engineer will notify the contractor of the acceptance of the submittal, or if additional information and/or changes are required. Any unacceptable part of the Submittals of Approval will require resubmission. The contractor must resubmit the Submittals of Approval for evaluation and review with the necessary changes or additional information provided. The engineer will provide a written notice of acceptance or rejection of contractor’s resubmitted Submittal for Approval within 14 calendar days after its receipt.

After the engineer’s acceptance of Submittal of Approval, no changes to the Submittal of Approval can be made without written consent of the engineer.

All Information Submittals should be submitted to the engineer. The engineer can reject the submittals which do not adequate detail, as required herein. The contractor shall resubmit the rejected submittals within 7 days upon the receipt of the engineer’s rejection notice.

C.2 General Grouting Requirement

Notify the engineer at least 24 hours in advance of the start of grouting operations.

If out of visible contact, continuous telephonic communication shall be maintained between the grout plant and the injection point.

Continuously agitate grout in the mixer and holding tanks. Remove Portland cement grout from the mixer, holding tank and supply line that is not injected into the hole within 2 hours after mixing and waste it.

Maintain grout at temperatures above 50 degrees F until injected. The temperatures of mixing water shall range from 50 degrees F to 100 degrees F when added to the grout mixer. Store grout materials at temperatures above freezing. Grouted ground shall be no colder than 40 degrees F when grout is injected and for a period of 5 days thereafter.

Protect grout holes from becoming clogged or obstructed prior to grouting by means of a cap or other suitable device on the collar of the hole. Clean out in a satisfactory manner or replace any hole that becomes blocked or otherwise unsuitable for its intended purpose at the expense of the contractor.

Flag and protect all grout hole locations. Clearly label grout locations for easy identification.

C.3 Contact Grout Injection

Perform contact grouting to reduce groundwater inflow, to fill voids, to minimize ground movement into the excavation, and to provide firm and uniform contact between the support system and the ground.

Equipment and lines shall be kept clean by constant circulation of grout and periodic flushing with water. Leakage from connections shall not be permitted. Plugs on ends of nearby grout holes or pipes shall be removed to permit escape of air and water and the filling of spaces with grout.

Once started, grouting of a hole shall not be interrupted. Grouting of a hole shall not be considered complete until that hole refuses to take grout as defined under article Refusal. After grouting of a hole or any stage of a hole has reached refusal, the pressure on the hole shall be maintained by means of a stopcock or other suitable device until the grout has set.

Grout progressively from pipe to pipe in the sequence submitted by the contractor or approved by the engineer. If necessary to relieve premature stoppage, periodic applications of water under pressure shall be considered. Grout that cannot be placed prior to initial set shall be discarded. Check operating gauges daily to determine that they are in working order. Do not grout without appropriate gauges in place and in working order.

Inject grout in continuous progression of the grout holes along the length of the tunnel or perimeter of the shaft. Where grout holes extend around the tunnel periphery, connections to higher grout holes shall not be made until the grout has completely filled the void space below as indicated by escape of grout of normal consistency from the higher holes. Exercise particular care to completely fill the voids on each side of any obstruction which interferes with the passage of grout. Vent holes for the release of air and water during grouting of crown or invert cavities shall be provided as necessary.

Where grouting in soil, the grouting pressure at the injection point shall not exceed 0.6 psi per foot of depth of soil overburden, unless otherwise proposed by the contractor, with the engineer's concurrence. In all cases, the grouting pressures shall be limited as necessary to avoid damage to the final lining.

The grouting of any hole shall not be considered complete until all voids have been filled to the maximum extent practicable. After the grouting of any hole is finished, the pressure shall be maintained by means of the stop valve until the grout has set to the extent that it will be retained in the hole.

C.4 Contact Grouting for Shaft

Perform contact grouting outside of initial support system where overcutting results in a 1/2-inch or wider void space between the ground and the excavation support system.

Locate grout holes as necessary to accomplish the work and to thoroughly fill the voids outside of the initial support system. Drill grout holes for contact grouting of initial supports through the initial supports and into the annular space between the initial support and surrounding ground.

Perform contact grouting at least once per day after the excavation support system has been advanced on that day.

Perform contact grouting to reduce groundwater inflow, to fill voids, to minimize ground movement into the excavation, and to provide firm and uniform contact between the support system and the ground. The contractor's ground support design engineer shall determine a refusal criteria and the maximum grout pressure that is consistent with the design of the ground support system. The engineer may periodically request that check holes be drilled to determine if unacceptable voids exist outside of the ground support system. Additional contact grouting shall be completed at no additional cost to the department where checking indicates the presence of unacceptable voids.

C.5 Contact Grouting after Pipe Jacking

The contractor shall commence contact grouting promptly (within 24 hours) following completion of each Tunnel drive. Once started for a tunnel drive, perform continuous contact grouting until contact grouting for the entire drive has been completed.

Grout holes for contact grouting of jacked pipe shall be pre-installed pipe nipples. New grout holes shall not be drilled through pipe walls unless specifically approved by the engineer.

Inject grout in continuous progression of the grout holes along the length of the tunnel. At any time during the grouting operations, sufficient contact grout holes ahead of the hole to be grouted shall be opened, plugs removed, holes cleaned and valves attached for controlled discharge (venting) of lubrication slurry, disturbed soil and groundwater within the overcut annulus. Keep grout port valves in a fully open position within a maximum safe grout communication distance, as determined by the contractor and accepted by the engineer in the grouting submittal. This distance may vary along the tunnel with variations in adjacent soil and groundwater conditions. Close or regulate discharge at ports opened for venting, as necessary to prevent lost ground from squeezing, a blow-in or excessive groundwater seepage. Continue venting from each opened port until grout of normal

consistency (not mixed with slurry, soil or water) is discharged from the vent holes. After an acceptable grout discharge is observed at a port, close the valve until a hook-up is made at the port for injection of grout.

Attempt to hook-up and pump grout at every port unless approval is granted by the engineer to skip selected holes. In general, contact grouting at a port will be considered completed when less than one cubic foot of grout of the accepted mix and consistency can be pumped in 5 minutes under the specified maximum pressure. After the grouting is finished, the valve shall be closed until grout has set. After a valve is closed following injection, the grout header and hoses shall be moved to the next port in progression.

Volume of contact grout injected shall be measured, recorded and compared with the anticipated volume per foot of pipe grouted with compensation for grout wasted in lines and vented through ports.

At the completion of grouting, remove valves after grout has set and replace valves with screw type grout plugs.

C.6 Cleanup
Minimize spilling and prevent the setting of any grout that may escape upon finished pipe or structure surfaces. Remove any spilled grout and restore the pipe or structure surface to its original condition. Properly dispose or all waste materials. Remove all grouting equipment and accessories from the tunnel.

D (Vacant)

E Payment
Contact grout used to fill any remaining voids outside of the jacked pipe shall be included under pay item of Tunnel Excavation. Contact grout used to fill any remaining voids outside of shaft excavation support system shall be included under pay item of Shaft Excavation Support System.

78. QMP Drilled Shafts.

A General
Perform this work in accordance to the requirements of standard specifications standard spec 501, standard spec 502, standard spec 701, standard spec 710 and standard spec 715 (conform to QMP Concrete Structures) except as deleted or additionally stipulated herein. This specification applies to all drilled shaft concrete placed under the following bid items:

SPV.0090.4450	Wall Secant Pile 47.24-Inch
SPV.0090.4455	Drilled Foundation Shaft 78.74-Inch
SPV.0090.4460	Drilled Foundation Shaft 98.43-Inch

B Materials

B.1 Concrete Mix Physical Requirements

For drilled shaft construction, use high compressive strength concrete, and relatively high cement content in the concrete mix with 590 to 675 pounds of cement per cubic yard. Additives or admixtures, when they are used, shall be clearly indicated. The concrete shall be a flowable, non-segregating concrete mix that does not exhibit rapid slump loss.

Unit Weight of Concrete, AASHTO T 121: Weight must be between 140 to 160 lb/ft^3.

Fine and course aggregate shall conform to the requirements of standard spec 501.2.5 except use only course aggregate size No. 1.

Any chemical admixture(s) to be used, other than air-entraining agents or water reducers from the department approved list, must be approved in advance by the engineer and meet the requirements of AASHTO M 194, as documented by independent laboratory test reports.

The adjustment of dosage rates of concrete admixtures will be permitted without requiring a new mix design.

B.2 Slump

The trial mix design for drilled shaft concrete shall include a Slump Loss Graph, or Slump versus Time after Batching. The Slump Loss Graph of a proposed drilled shaft mix design illustrates the slump reducing slowly and still exceeding a 5-inch slump two hours after batching. Careful attention to concrete mix designs made with retarders must be exercised, and a close monitoring shall be implemented during construction to preclude rapid slump loss, not given enough time for concreting completion before the concrete mix sets.

Adding water to a ready-mix truck is prohibited. In cases in which part of the water of the concrete mix is added at the batch plant and the remaining water is added at the job site, the amount of water to be added at the job site shall be stated on the mix design sheet carried by the ready-mix truck driver. Testing of concrete will then be conducted on the resulting mix, and further water cannot be added at any time to increase the mix slump or to bring the mix to a specific slump. If after all the water permitted in the mix design has been added and the slump is still out of these specifications, the contractor must reject the mix. Repair or replace drilled shafts of questionable concrete design mixes at no additional cost to the department.

The following table presents the ranges for the slump.

	Slump Range in Inches		
	Concrete Placed by Free Falling	Concrete Placed by Tremie	Concrete Placed by Pump
Dry Installation Method			
Uncased or Cased Excavations	7 to 9	8 to 9½	7 to 9½
Wet Installation Method			
Uncased or Cased Excavations	N/A	8 to 9½	7 to 9½

B.3 Slurry

B.3.1 General

Slurry shall be a stable suspension of mineral in potable water or polymer slurry. Maintain a stable suspension at all times. Bentonite slurry shall be mineral slurry of powdered Wyoming or Dakota bentonite, with density, viscosity, and pH as specified in the table below:

Property at 68°F Units	At the Time of Slurry Introduction into the Drilled Shaft	Before Concrete Placement in the Drilled Shaft	Test Method
Density in Fresh Water (lb/ft^3) (a)	64 to 69	64 to 75	Density Balance
Viscosity (seconds per quart)	28 to 45	28 to 45	Marsh Funnel
pH	7 to 11	7 to 11	pH paper or meter
Sand Content (%) (b)	4 maximum	10 maximum	200 Sieve Retain

(a) At time of concreting, sand content shall not exceed 10 percent (by volume) at any point in the drilled shaft excavation; test for sand content as determined by the American Petroleum Institute.

(b) Bentonite slurry shall be disposed of offsite in approved manner as accepted by the WDNR.

The contractor may adjust the range of slurry properties when field trials and field tests show that modifications are necessary to bring the slurry to specifications.

Polymer slurry shall be a suspension of powdered polyacrylamide or vinyl polymer with the following characteristics:

Property at 68°F Units	At the Time of Slurry Introduction into the Drilled Shaft	Before Concrete Placement in the Drilled Shaft	Test Method
Density in Fresh Water (lb/ft^3) (a)	63 or less	63 or less	Density Balance
Viscosity (seconds per quart)	50 minimum	50 minimum	Marsh Funnel
pH	8 to 11	8 to 11	pH paper or meter
Sand Content (%)	2 maximum	10 maximum	200 Sieve Retain

(a) At time of concreting, sand content shall not exceed 10 percent (by volume) at any point in the drilled shaft excavation; test for sand content as determined by the American Petroleum Institute.

Obtain slurry samples from the midpoint and bottom of each drilled shaft prior to the placement of the reinforcing steel. Correct the slurry as necessary to meet the specification requirements.

B.3.2 Tests

To ensure that the results are within the ranges stated in the table above, perform the following tests on the mineral slurry supplied to the drilled shaft excavation at different depths within the drilled shaft using a slurry sampler.

B.3.2.1 Wisconsin Method of Test for Density of Slurry (Mud Weight)

Density shall be measured at 68°F. This test is identical to ASTM D 4380 except that the mineral slurry to be tested shall consist of processed attapulgite or bentonite clays, and the temperature of the slurry (using a 0-105°C thermometer) shall be measured and recorded on the drilling Mud Report form.

B.3.2.2 Wisconsin Method of Test for Viscosity of Slurry

The viscosity shall be measured at 68°F or a constant temperature with the Marsh Cone Method.

B.3.2.2.1 Scope

The Marsh Funnel or Marsh Cone is used to measure viscosity of drilling fluids. This test method has been adapted from Section 2 of the American Petroleum Institute (API) Recommended Practice FM8-RP13B-1: Standard Procedure for Field Testing Water-Based Drilling Fluids (FM 8-RP13B-1). Use of a direct-reading viscometer has been eliminated.

B.3.2.2.2 Equipment

Marsh Funnel: A Marsh Funnel is calibrated to out-flow 946 mL (one quart) of fresh water at a temperature of 21 ±3°C (70 ±5°F) in 26 ±0.5 seconds. A graduated cup is used as a receiver.

Specifications:

Funnel Cone Length	305 mm (12.0 in.)
Diameter	152 mm (6.0 in.)
Capacity to bottom of screen	1500 mL
Orifice Length	50.8 mm (2.0 in.)
Inside Diameter	4.7mm (3/16 in.)
Screen	12 mesh

Has 1.6 mm (1/16 in.) openings and is fixed at a level 19.0 mm (3/4 in.)

B.3.2.3 Wisconsin Method of Test for Sand Content of Slurry

B.3.2.3.1 Scope

The sand content of mud is the volume percent of particles larger than 74 microns. It is measured by a sand-screen set. This test method has been adapted from Section 5 of the American Petroleum Institute (API) Recommended Practice 13B-1: standard Procedure for Field Testing Water-Based Drilling Fluids (RP13B-1).

B.3.2.3.2 Equipment

200-mesh sieve, 63.5 mm (2.5 in.) in diameter.
Funnel to fit sieve.
Glass measuring tube marked for the volume of mud to be added. The tube is graduated from 0 to 20 percent in order to read directly the percentage of sand.

B.3.2.3.3 Procedure

Fill the glass measuring tube with mud to the "mud" mark. Add water to the next mark. Close the mouth of the tube and shake vigorously. Pour the mixture onto the clean, wet screen. Discard the liquid passing though the screen. Add more water to the tube, shake, and again pour onto the screen. Repeat until the tube is clean. Wash the sand retained on the screen to free it of any remaining mud.

Put the funnel upside down over the top of the sieve invert. Slowly tip the assembly and insert the tip of the funnel into the mouth of the glass tube. Wash the sand into the tube by playing a fine spray of water through the screen. Allow the sand to settle. From the graduations on the tube, read the volume percent of the sand.

Report the sand content of the mud by percent volume. Report the source of the mud sample, i.e. above shaker, suction pit, etc. Coarse solids other than sand will be retained on the screen (e.g., lost circulation material) and the presence of such solids should be noted.

B.3.2.4 Wisconsin Method of Test for pH of Slurry

pH shall be measured by the Electric pH meter or pH indicator paper strips.

B.3.2.4.1 Scope

Field measurement of drilling fluid (or filtrate) pH and adjustments to the pH are fundamental to drilling fluid control. This test method has been adapted from Section 7 of the American Petroleum Institute (API) Recommended Practice 13B-1: Standard Procedure for Field Testing Water-Based Drilling Fluids (RP 13B-1).

The recommended method for pH measurement of drilling fluid is with a glass electrode pH meter. This method is accurate and gives reliable pH values, being free of interference if a high quality electrode system is used with a properly designed instrument. Rugged pH instruments are available that automatically temperature compensate the slope and are preferred over the manually adjusted instruments.

NOTE: Color matching pH paper and sticks are used for field pH measurements, but are not the methods recommended. These methods are reliable only in very simple water muds. Mud solids, dissolved salts and chemicals, and dark-colored liquids cause serious errors in pH paper values. Readability is normally about 0.5 pH unit.

B.3.2.4.2 Equipment

pH meter: millivolt range potentiometer calibrated to show pH units for measuring the potential between a glass-membrane electrode and a standard "reference" electrode. The instrument is (preferred) to be water, shock, and corrosion-resistant and portable. Specifications are:
pH range: 0 to 14.
Electronics type: solid state (preferred).
Power source: batteries (preferred).
Operating temperature range: 0-66°C (32-150°F).
Readout: digital (preferred).
Resolution: 0.1 pH unit.
Accuracy: ±0.1 pH unit.
Repeatability: 0.1 pH unit.
Adjustments.
"Temperature" compensation of electrode system.
"Slope" of electrode system (preferred).
"Calibration" setting of readout. (Instrument with the above internal temperature compensation is preferred.)

Electrode system: A combination system of a glass electrode for sensing H^+ ions and a standard voltage reference electrode, constructed as a single electrode (preferred). Body of this probe should be constructed of durable material. A flat-end probe is preferred for better protection and easier cleaning of the electrode. Waterproof connection to the meter is recommended. Specifications are:
Glass pH electrode response range: 0 to 14 pH unit.
Electrodes: a glass electrode and a silver/silver chloride electrode in combination, having a ceramic or a plastic single or double junction.
Electrolyte in reference electrode: KCl gel.
Glass composition: suitable for low sodium ion error.
Sodium ion error: at pH = 13 or at 0.1 mole Na^+ ion, an error less than 0.1 pH unit.
Buffer solutions: three solutions to calibrate and set slope of pH meter prior to sample measurement.
pH = 4.0: potassium hydrogen phthalate at 0.05 molar in water. Gives 4.01 pH at 24°C (75°F).

pH = 7.0: potassium dihydrogen phosphate at 0.02066 molar and disodium hydrogen phosphate at 0.02934 molar in water. Gives 7.00 pH at 24°C (75°F).
pH = 10.0: sodium carbonate at 0.025 molar and sodium bicarbonate at 0.025 molar in water. Gives 10.01 pH at 24°C (75°F).

NOTE: Buffers may be obtained from supply houses as pre-made solution, dry-powder packages, or a given formula, but must duplicate National Bureau of Standards primary or secondary buffers. Shelf life of all buffers not to exceed six months. Date of preparation of buffer should be shown on bottles used in the field. Bottles should be kept tightly stoppered.
Distilled or deionized water: in spray bottle.
Soft tissues: to blot electrodes.
Thermometer: glass, 0-150°C (32-220°F).

Accessory equipment: Soft-bristle test tube brush: to clean electrode.
Mild liquid detergent: Ivory, or equivalent.
Electrode storage vial: to keep electrode moist.
Sodium hydroxide: 0.1 molar (approximately); to recondition electrode.
Hydrochloric acid: 0.1 molar (approximately); to recondition electrode.
Ammonium bifluoride: 10% solution (approximately); to recondition electrode.
CAUTION: This is a strong and toxic acid.
Hydrofluoric acid: ACS reagent grade.
CAUTION: This is a strong acid.

B.3.2.4.3 Procedure – pH Measurement
Obtain sample of fluid to be tested. Allow it to reach 24±3°C (75±5°F). Allow buffer solution to also reach the same temperature as the fluid to be tested.

NOTE: For accurate pH measurement; the test fluid, buffer solution, and reference electrode must all be at the sample temperature. The pH of the buffer solution indicated on the container label is the correct pH only at 24°C (75°F). If attempting to calibrate at another temperature, the actual pH of the buffer at this temperature must be used. Tables of buffer pH values at various temperatures are available from the suppliers and should be used in the calibration procedure.

Clean electrodes by washing with distilled water and blot dry. Place probe into pH 7.0 buffer.
Turn on meter; wait 60 seconds for reading to stabilize. Measure temperature of pH 7 buffer solution. Set this temperature on “temperature” knob. Set meter reading to “7.0” using “calibration” knob. Rinse probe with distilled water and blot dry.

Repeat operations using either pH 4.0 or pH 10.0 buffer. Use pH 4.0 if “acidic” sample, or pH 10.0 if “alkaline” sample is to be tested. Set meter to number “4.0” or “10.0” respectively, using “slope” adjustment knob. (If no “slope” knob exists, use the “temperature” knob to set “4.0” or “10.0” on meter). Check the meter with pH 7 buffer

again. If it has changed, reset to "7.0" with "calibration" knob. Repeat procedures to ensure equipment is properly calibrated.

NOTE: Discard and do not reuse the sample of buffer solutions used in calibration. Meter should be fully calibrated every day using two buffers. Check with pH 7 buffer every three hours. If meter calibrates properly, rinse electrode with distilled water and blot dry. Place electrode in sample to be tested and stir gently. Allow 60 to 90 seconds for reading to stabilize.
Record sample pH to nearest 0.1 pH unit and the temperature of sample tested. Carefully clean the electrode in preparation for next usage. Store in vial of pH 4 buffer. NEVER let the probe tip become dry. Turn meter off and close cover to protect instrument. Avoid storing instrument at extreme temperatures (below 0°C (32°F) or above 49°C (120°F)).

Care of Electrode: Cleaning the electrode will be necessary periodically, especially if oil or clay particles coat the face of the glass electrode or the porous frit of the reference electrode. Clean electrode with a soft-bristle brush and a mild detergent. Reconditioning the electrode may be necessary if plugging becomes sever, as indicated by slow response, drifting of readings, or if "slope" and "calibration" cannot be mutually set. Recondition by soaking electrode for 10 minutes in 0.l M HCl followed by rinsing in water and soaking for 10 minutes in 0.1 M NaOH and rinsing again. Check electrode for response by performing calibration. If electrode continues to perform poorly, soak electrode for two minutes only in 10% $NH_4F \cdot HF$ solution. (CAUTION: This is strong and toxic acid). Replace electrode system if above steps fail to recondition it.

C (Vacant)

D (Vacant)

E Payment
E.1 QMP Drilled Shafts
Costs for furnishing all sampling, testing, and documentation required under this special provision and all other associated work are incidental to the work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor's pay.

79. Temporary Shoring B-40-855, Item 511.1200.0001; Temporary Shoring R-40-524, Item 511.1200.0002; Temporary Shoring R-40-551, Item 511.1200.0003; Temporary Shoring R-40-552, Item 511.1200.0004; Temporary Shoring 24FCB+78 to 32FCB+19, Item 511.1300.0001; Temporary Shoring 41FCB+67 to 45FCB+07, Item 511.1300.0002; Temporary Shoring 344NS+62 to 346NS+00, Item 511.1300.0003; Temporary Shoring 595SW+59 to 595SW+78, Item 511.1300.0004; Temporary Shoring 317NS+85 to 318NS+20, Item 511.1300.0005; Temporary Shoring 321NS+38 to 323NS+97, Item 511.1300.0006; Temporary Shoring 326NS+28 to 327NS+14, Item 511.1300.0007;

Temporary Shoring 269EW+98 to 279EW+44, Item 511.1300.0008; Temporary Shoring 273EW+97 to 279EW+25, Item 511.1300.0009; Temporary Shoring 313NS+33 to 318NS+00, Item 511.1300.0010; Temporary Shoring 232EW+65 to 233EW+15, Item 511.1300.0011; Temporary Shoring 233EW+76 to 234EW+26, Item 511.1300.0012; Temporary Shoring 152EW+14 to 152EW+71, Item 511.1300.0013; Temporary Shoring 802BB+15 to 802BB+36, Item 511.1300.0014; Temporary Shoring 802BB+16 to 802BB+58, Item 511.1300.0015; Temporary Shoring 802BB+58 to 803BB+00, Item 511.1300.0016; Temporary Shoring 802BB+80 to 803BB+01, Item 511.1300.0017; Temporary Shoring Left in Place B-40-855, Item 511.2200.0001; Temporary Shoring Left in Place B-40-789, Item 511.2200.0002; Temporary Shoring Left in Place R-40-525, Item 511.2200.0003; Temporary Shoring Left in Place R-40-536, Item 511.2200.0004.

A Description

This special provision describes designing and providing temporary shoring at locations the plans show.

B Materials

Provide a shoring design for each location where the plan requires temporary shoring. Conform to AASHTO Load and Resistance Factor Design Specifications and the WisDOT Bridge Manual. Design to address all limit states using a design life of 36 months or the project specific duration, whichever is greater. Have a professional engineer, registered in the state of Wisconsin and knowledgeable of the specific site conditions and requirements, verify the adequacy of the design. Submit one copy of each shoring design, signed and sealed by the same professional engineer verifying the design, to the engineer for incorporation into the permanent project record.

C Construction

Provide temporary shoring at each required location conforming to the design developed for that location as follows:

Under the Temporary Shoring (structure) bid items: for temporary shoring associated with structure ID numbers identified in the bid item supplemental descriptions.

Under the Temporary Shoring (location) bid items: for temporary shoring associated with roadway locations identified in the bid item supplemental descriptions.

Remove temporary shoring no longer needed unless the engineer allows it to remain in place. Under the left-in-place bid items, leave the shoring in place. Place backfill conforming to standard spec 206.3.13 in excavated space not occupied by the new permanent construction.

D Measurement

The department will measure the Temporary Shoring bid items by the square foot, acceptably completed at locations the plans show, measured as the area of exposed face in the plane of the shoring from the ground line in front of the shoring to a maximum of one foot above the retained grade. Shoring used for staged construction in multiple configurations without removal and reinstallation will be measured once based on the configuration with the largest area of exposed face.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
511.1200.0001	Temporary Shoring B-40-855	SF
511.1200.0002	Temporary Shoring R-40-524	SF
511.1200.0003	Temporary Shoring R-40-551	SF
511.1200.0004	Temporary Shoring R-40-552	SF
511.1300.0001	Temporary Shoring 24FCB+78 to 32FCB+19	SF
511.1300.0002	Temporary Shoring 41FCB+67 to 45FCB+07	SF
511.1300.0003	Temporary Shoring 344NS+62 to 346NS+00	SF
511.1300.0004	Temporary Shoring 595SW+59 to 595SW+78	SF
511.1300.0005	Temporary Shoring 317NS+85 to 318NS+20	SF
511.1300.0006	Temporary Shoring 321NS+38 to 323NS+97	SF
511.1300.0007	Temporary Shoring 326NS+28 to 327NS+14	SF
511.1300.0008	Temporary Shoring 269EW+98 to 279EW+44	SF
511.1300.0009	Temporary Shoring 273EW+97 to 279EW+25	SF
511.1300.0010	Temporary Shoring 313NS+33 to 318NS+00	SF
511.1300.0011	Temporary Shoring 232EW+65 to 233EW+15	SF
511.1300.0012	Temporary Shoring 233EW+76 to 234EW+26	SF
511.1300.0013	Temporary Shoring 152EW+14 to 152EW+71	SF
511.1300.0014	Temporary Shoring 802BB+15 to 802BB+36	SF
511.1300.0015	Temporary Shoring 802BB+16 to 802BB+58	SF
511.1300.0016	Temporary Shoring 802BB+58 to 803BB+00	SF
511.1300.0017	Temporary Shoring 802BB+80 to 803BB+01	SF
511.2200.0001	Temporary Shoring Left in Place B-40-855	SF
511.2200.0002	Temporary Shoring Left in Place B-40-789	SF
511.2200.0003	Temporary Shoring Left in Place R-40-525	SF
511.2200.0004	Temporary Shoring Left in Place R-40-536	SF

Payment for the Temporary Shoring bid items is full compensation for designing and providing shoring; for providing a signed and sealed copy of the design; for removal or additional work required to leave in place; and for backfilling.

The department will not pay for temporary shoring for locations the plans do not show.

80. Painting Epoxy System B-40-852; Painting Epoxy System B-40-891.

A Description
This special provision describes work that shall be in accordance to standard spec 517 and as hereinafter provided:

B Materials
B.1 Coating System
Furnish a complete coating system from the department's approved list. The color of epoxy shall be white and the urethane coating material shall match the color number shown on the plans in accordance to Federal Standard Number 595B, as printed in 1989. Supply the engineer with the product data sheets before any coating is applied. The product data sheets shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, the minimum drying time for shop applied coats, and the recommended procedures for coating galvanized bolts, nuts, and washers.

C Construction
Modify the fourth paragraph of standard spec 517.3.1.7.2 to read:

On all other areas including the outside surfaces of splice plates, the minimum dry film thickness above the surface profile for the primer coat shall be 3.0 mils (0.076 mm).
517-041 (20040820)

81. Concrete Staining B-40-785, Item 517.1010.S.0001; Concrete Staining R-40-554, Item 517.1010.S.0002; Concrete Staining R-40-555, Item 517.1010.S.0003; Concrete Staining R-40-560, Item 517.1010.S.0004.

A Description
Furnish and apply a two coat concrete stain to the exposed concrete surfaces of the structure, as detailed in the plans and as hereinafter provided.

B Materials
B.1 Mortar
Use mortar for sack rubbing the concrete surfaces as given in standard spec 502.3.7.5 or use one of the following products:

Preblended, Packaged Type II Cement:	Tri-Mix by TK Products
	Thoroseal Pearl Gray by Thoro Products

The mortar shall contain one of the following acrylic bonding admixtures mixed and applied in accordance to manufacturer's recommendations:

Acrylic Bonding Admixture:	TK-225 by TK Products
	Achro 60 by Thoro Products
	Achro Set by Master Builders

B.2 Concrete Stain

Use concrete stain manufactured for use on exterior concrete surfaces, consisting of a base coat and a pigmented sealer finish coat. Use the following products, or equal as approved by the department, as part of the two coat finish system:

Tri-Sheen Concrete Surfacer, Smooth by TK Products
Tri-Sheen Acrylic by TK Products
TK-1450 Natural Look Urethane Anti-Graffiti Primers by TK Products
Safe-Cure and Seal EPX by Chem Masters
H + C Shield Plus by Sherwin-Williams

C Construction

C.1 General

Furnish, prepare, apply, cure, and store all materials in accordance to the product manufacturer's specifications for the type and condition of application required.

Match or exceed the stain manufacturer's minimum recommended curing time of the concrete or 28 days, whichever is greater, prior to staining.

C.2 Preparation of Concrete Surfaces

Provide a sack rubbed finish in accordance to standard spec 502.3.7.5, using mortar as indicated above on concrete surfaces with open voids or honeycombing.

Following the sack rubbing, clean all concrete surfaces that are to be coated to ensure that the surface is free of all laitance, dirt, dust, grease, efflorescence, and any foreign material and that the surface will accept the coating material according to product requirements. As a minimum, clean the surface using a 3000-psi water blast. Hold the nozzle of the water blaster approximately 6 inches from the concrete surface and move it continuously in a sweeping motion. Give special attention to smooth concrete surfaces to produce an acceptable surface texture. Correct any surface problems resulting from the surface preparation methods. Grit blasting of the concrete surface is not allowed.

C.3 Staining Concrete Surfaces

Apply the concrete stain in accordance to the manufacturer's recommendations.

Apply the concrete stain when the temperature of the concrete surface is 45º F or higher, or as given by the manufacturer.

The color of the stain shall be as given on the plan. Tint the base coat to match the finish coat; the two coats shall be compatible with each other.

Do not begin staining the structure until earthwork operations are completed to a point where this work can begin without receiving damage. Where this work is adjacent to exposed soil or pavement areas, provide temporary covering protection from overspray or splatter.

C.4 Test Areas
Prior to applying stain to the structure, apply the stain to sample panels measuring a minimum of 48-inches x 48-inches and constructed to demonstrate workmanship in the use of the form liner specified on the structure if applicable. Match or exceed the stain manufacturer's minimum recommended curing time of the concrete or 28 days, whichever is greater, prior to staining. Prepare the concrete surfaces of the sample panels and apply stain using the same materials and in the same manner as proposed for the structure, including staining of the joints between the stones produced by the form liner if applicable. Do not apply stain to the structure until the department approves the test panels.

C.5 Surfaces to be Coated.
Apply concrete stain to the surfaces in accordance to the plan.

D Measurement
The department will not measure Concrete Staining (Structure). The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
517.1010.S.0001	Concrete Staining B-40-785	SF
517.1010.S.0002	Concrete Staining R-40-554	SF
517.1010.S.0003	Concrete Staining R-40-555	SF
517.1010.S.0004	Concrete Staining R-40-560	SF

Payment is full compensation for furnishing and applying the two coat system; for preparing the concrete surface; and for preparing the sample panels.
517-110 (20100709)

82. Architectural Surface Treatment R-40-501, Item 517.1050.S.0001; Architectural Surface Treatment R-40-504, Item 517.1050.S.0002; Architectural Surface Treatment R-40-511, Item 517.1050.S.0003; Architectural Surface Treatment R-40-514, Item 517.1050.S.0004; Architectural Surface Treatment R-40-522, Item 517.1050.S.0005; Architectural Surface Treatment R-40-523, Item 517.1050.S.0006; Architectural Surface Treatment R-40-524, Item 517.1050.S.0007; Architectural Surface Treatment R-40-525, Item 517.1050.S.0008; Architectural Surface Treatment R-40-536, Item 517.1050.S.0009; Architectural Surface Treatment R-40-546, Item 517.1050.S.0010; Architectural Surface Treatment R-40-548, Item 517.1050.S.0011; Architectural Surface Treatment R-40-551, Item 517.1050.S.0012; Architectural Surface Treatment R-40-552, Item 517.1050.S.0013; Architectural Surface Treatment R-40-554, Item 517.1050.S.0014;

Architectural Surface Treatment R-40-555, Item 517.1050.S.0015; Architectural Surface Treatment R-40-556, Item 517.1050.S.0016; Architectural Surface Treatment R-40-557, Item 517.1050.S.0017; Architectural Surface Treatment R-40-560, Item 517.1050.S.0018; Architectural Surface Treatment R-40-618, Item 517.1050.S.0019; Architectural Surface Treatment R-40-619, Item 517.1050.S.0020; Architectural Surface Treatment R-40-620, Item 517.1050.S.0021; Architectural Surface Treatment Minor Retaining Wall R-1, Item 517.1050.S.0022.

A Description

Construct a concrete masonry architectural surface treatment on the exposed concrete surfaces of the structure, as detailed in the plans and as hereinafter provided.

B Materials

Use form liners that attach easily to the forming system, and do not compress more than ¼-inch when poured at a rate of 10 vertical feet/hour.

Use a release agent that is compatible with the form liner and coloring materials.

Wall ties shall have set "break-backs" at a minimum of ¾-inches from the finished concrete surface.

C Construction

C.1 Equipment

Equipment and tools necessary for performing all parts of the work shall be satisfactory as to design, capacity, and mechanical condition for the purposes intended. Repair, improve, replace, or supplement all equipment that is not maintained in full working order, or which is proven inadequate to obtain the results prescribed.

C.2 Form Liner Preparation

Clean the form liner prior to each pour and ensure that it is free of any build-up. Visually inspect each liner for blemishes or tears, and repair if necessary per manufacturer's recommendations.

Apply form release per manufacturer's recommendations.

C.3 Form Liner Attachment

Place adjacent liners less than ¼-inch from each other, attach liner securely to forms in accordance to the manufacturer's recommendations, and coordinate wall ties with form liner and form manufacturer, e.g., diameter, size, and frequency.

C.4 Surface Finishing
Ensure that the textured surface is free of laitance; sandblasting is not permitted.

Grind or fill pouring blemishes.

D Measurement
The department will not measure Architectural Surface Treatment (Structure). The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
517.1050.S.0001	Architectural Surface Treatment R-40-501	SF
517.1050.S.0002	Architectural Surface Treatment R-40-504	SF
517.1050.S.0003	Architectural Surface Treatment R-40-511	SF
517.1050.S.0004	Architectural Surface Treatment R-40-514	SF
517.1050.S.0005	Architectural Surface Treatment R-40-522	SF
517.1050.S.0006	Architectural Surface Treatment R-40-523	SF
517.1050.S.0007	Architectural Surface Treatment R-40-524	SF
517.1050.S.0008	Architectural Surface Treatment R-40-525	SF
517.1050.S.0009	Architectural Surface Treatment R-40-536	SF
517.1050.S.0010	Architectural Surface Treatment R-40-546	SF
517.1050.S.0011	Architectural Surface Treatment R-40-548	SF
517.1050.S.0012	Architectural Surface Treatment R-40-551	SF
517.1050.S.0013	Architectural Surface Treatment R-40-552	SF
517.1050.S.0014	Architectural Surface Treatment R-40-554	SF
517.1050.S.0015	Architectural Surface Treatment R-40-555	SF
517.1050.S.0016	Architectural Surface Treatment R-40-556	SF
517.1050.S.0017	Architectural Surface Treatment R-40-557	SF
517.1050.S.0018	Architectural Surface Treatment R-40-560	SF
517.1050.S.0019	Architectural Surface Treatment R-40-618	SF
517.1050.S.0020	Architectural Surface Treatment R-40-619	SF
517.1050.S.0021	Architectural Surface Treatment R-40-620	SF
517.1050.S.0022	Architectural Surface Treatment Minor Retaining Wall R-1	SF

Payment is full compensation for producing the proposed architectural surface treatment including: preparing the foundation; finishing and protecting the surface treatment; and for properly disposing of surplus material.
517-150 (20110615)

83. Noise Barriers Double-Sided Sound Absorptive N-40-62, Item 531.0300.S.0001; N-40-68, Item 531.0300.S.0002; N-40-69, Item 531.0300.S.0003; N-40-70, Item 531.0300.S.0004; N-40-71, Item 531.0300.S.0005; N-40-72, Item 531.S.0300.0006; N-40-73, Item 531.0300.S.0007; N-40-74, Item 531.0300.S.0008; N-40-75, Item 531.0300.S.0009; N-40-80, Item 531.0300.S.0010; N-40-81, Item 531.0300.S.0011.

A Description

This special provision describes designing, fabricating, transporting, and erecting double-sided sound absorptive noise barriers in accordance to the plans, applicable portions of the standard specifications, the department-approved installation specifications, and as hereinafter provided.

B Materials

All materials used in the work shall conform to the pertinent requirements of the standard specifications and as hereinafter specified.

Provide grade A, A-2, A-FA, A-S, A-T, A-IS, or A-IP concrete conforming to standard spec 501 for concrete posts and the core component of composite concrete sound absorbing panels.

B.1 System Pre-Qualification

The noise wall system supplied must be pre-qualified by the department. The department maintains a list of pre-qualified systems which can be viewed at: http://www.dot.wisconsin.gov/business/engrserv/approvedprod.htm. Systems eligible for use on this project shall be pre-qualified and added to that list prior to the award of this contract.

B.2 Design

The department specifies pre-qualified double-sided sound absorptive noise barrier products on the department's approved product lists available at:

http://www.dot.wisconsin.gov/business/engrserv/approvedprod.htm

Provide the name of the selected system to the engineer within 25 days after award of the contract. Schedule a pre-design meeting with the engineer subsequent to award of the contract and prior to beginning design of the noise barrier. The suppliers of the noise barrier components shall attend this meeting.

B.2.1 Structural and Foundation Design

The structural and foundation design of the noise barrier system shall be in accordance to the current edition of "Guide Specifications for Structural Design of Sound Barriers published by the American Association of State Highway and Transportation Officials (AASHTO), 444 North Capitol Street, NW, Suite 225, Washington, DC 20001.

Design the noise barrier to withstand wind pressure, applied perpendicular to the barrier, in each direction, of 28.5 pounds per square foot for ground mounted barriers, and 37.5 pounds per square foot for structure mounted barriers.

The top 3-feet of supporting soil shall be ignored in the design of ground-mounted barrier foundations.

B.2.2 Fire Hose Access Openings

Design fire hose access openings, at locations shown on the plans, with additional reinforcement and protective coating around the opening as necessary to maintain structural integrity. Detail drawings shall show the additional reinforcement and method for attaching the Fire Hydrant Location Signs to the barrier panel.

B.2.3 Barrier Profile

Unless otherwise shown on the plan or approved by the engineer, design the top of the noise barrier to be horizontal and at or above the acoustic elevation line shown on the plans. The bottom elevation of the noise barrier shall be as shown on the plans. Changes in elevation shall be accomplished by stepping sections at posts. Steps shall not exceed 3-feet in height. All joints shall be horizontal or vertical and shall be aligned with the adjacent panels.

B.2.4 Panel Orientation

Design the panels to prevent entrapment and ponding of water. Avoid inadvertently providing areas for perching, nesting of birds, or collecting of dirt and debris in the design of the noise barrier system.

B.2.5 Color and Surface Texture

Unless otherwise shown and provided for in the plans, wall pattern shall contain textures with relief features of sufficient depth and quantity to be distinguishable at an observation distance of 500-feet. The color(s) and texture(s) chosen will be within the following parameters; however, at the discretion of the engineer, a single color and/or a single texture may be selected for either side of the noise barrier.

	Freeway Side	**Residential Side**
Number of colors	2	2
In the proportion of	75:25 (±5%)	75:25 (±5%)
Number of textures	2	2
In the proportion of	75:25 (±5%)	75:25 (±5%)

The final color of the panels and posts shall be as shown on the plans and match the Federal Standard color system list. Coating and coloring of the post and panels shall be shop applied.

Base Color – 33564
Accent Color #1 - 33448

All individual noise barrier panels shall be the same color on both sides, unless otherwise approved by the engineer.

Supply and deliver to the engineer a 3-foot x 5-foot minimum test panel for each panel type, with the specified pattern and colors. Obtain the engineer's acceptance of the panel's pattern and color prior to production of the panels required for the contract. The accepted pattern and color test panels shall remain on the project site in a readily accessible location for the duration of the project. The accepted pattern and color sample panels will be the standard for all noise barriers on the project.

The engineer will visually inspect panels for color consistency upon arrival at the project. The panels shall have no substantial variation in color from the accepted sample panel submitted for the project. All panels with substantial color variation will be rejected and shall be removed from the project.

B.2.6 Sound Transmission Loss (TL)

Design the noise barrier panel material to achieve a transmission loss equal to or greater than 20 decibels in all test frequency bands.

B.2.7 Noise Reduction Coefficient (NRC)

Design the noise barrier so that at least 70 percent of the highway side of the noise barrier panels that are 2-feet above the ground shall have a minimum NRC of 0.80. The remaining noise barrier panels on the highway side that are 2-feet or more above the ground shall have a minimum NRC of 0.70. The minimum NRC for panels on the residential side, which are 2-feet above the ground shall be 0.70.

B.2.8 Structural Steel

Provide structural steel posts for all structure mounted noise barriers. Galvanize all structural steel after fabrication by the hot dip process in accordance to ASTM A123. Galvanize steel hardware and threaded fasteners, bolts, nuts, and washers in accordance to ASTM A153.

Shop coat all steel galvanized surfaces exposed to view with an approved paint system as hereinafter specified. Clean galvanizing surfaces to be painted per SSPC-SP1 to remove, chlorides, sulfates zinc salts, oil, dirt, organic matter and other contaminants. The cleaned surface should then be Brush Blast Cleaned per SSPC-SP7 to create a slight angular surface profile (1.0 – 1.5 mils suggested) for adhesion. Blasting should not fracture the galvanized finish or remove any dry film thickness.

After cleaning, provide a tie coat from an approved coating system that is specifically intended to be used on a galvanized surface. The tie coat shall etch the galvanized surface and prepare the surface for the top coat. Apply a top coat matching the finished color specified in B.2.5. Use a pre-approved top coat that is resistant to the effects of the sun, and is suitable for use in a marine environment. Exercise care so as not to damage the painted surfaces during shipment and erection of the noise barriers.

Use one of the qualified paint sources and products given below. An equivalent system may be used with the written approval of the engineer. Supply the engineer with the product data sheets before applying any coating. The product data sheets shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, the minimum drying time for shop applied coats, and the recommended procedures for coating galvanized bolts, nuts, and washers.

Producer	Coat	Products	Dry Film Minimum Thickness (mils)	Minimum Time Between Coats (hours)
Sherwin Williams 1051 Permeter Drive, Suite 710 Schaumburg, IL 60173 (847) 330-1562	Tie	Recoatable Epoxy Primer B67-5 Series/B67V5	2.0 to 4.0	6
	Top	Acrolon 218 HS Polyurethane, B65-650	2.0 to 4.0	NA
Carbolin 350 Hanley Industrial St Louis, MO 63144 (314) 644-1000	Tie	Rustbond Penetrating Sealer FC	1	36
	Top	Carboline 133 LH	4	NA
Wasser Corporation 4118 B Place NW Suite B Auburn, WA 98001	Tie	MC-Ferrox B 100	3.0 to 5.0	8
	Top	MC-Luster 100	2.0 to 4.0	NA

B.2.9 Design Coordination

B.2.9.1 Underground Utility and Drainage Crossings

Design the noise barrier post spacing so as not to interfere with the existing utility and drainage facilities.

Design the noise barrier post spacing so as not to interfere with proposed utility and drainage facilities shown in the plans. This includes proposed roadway lighting and ITS facilities.

B.2.9.2 Proposed Structures

For noise barriers mounted behind or near proposed retaining walls, coordinate and design the noise barrier post spacing so as to not interfere with embedded portion of the proposed retaining walls, including MSE wall soil reinforcement and tieback anchors on soldier pile and timber lagging retaining walls.

For noise barriers mounted on proposed bridges and retaining walls, coordinate and design the noise barrier post spacing to coincide with noise barrier post and embedded noise barrier anchor assembly spacing shown on the bridge and retaining wall plans. Coordinate any required changes to the noise barrier post spacing and embedded noise barrier anchor

assembly locations shown on the bridge and retaining wall plans, if required for the design of the noise barrier.

Noise Barrier	Mounted on Structure[1]	Ground Mounted Behind Structure[1]
N-40-68	R-40-546 Station 17+35 to 28+33	NA
N-40-69	R-40-546 Station 10+00 to 15+75	NA
N-40-73	R-40-552 Station 10+20 to 16+91	NA
N-40-74	R-40-548 Station 19+38 to 23+70	NA
N-40-75	R-40-548 Station 12+39 to 17+62	R-40-548 Station 11+00 to 12+39

1. Stations given are retaining wall stations and are approximate.

B.2.10 Project Submittal Requirements

Submit three copies of the following documents to the engineer for review:

1. All structural and foundation design calculations.
2. Detailed design/shop drawings.
3. Certifications for all materials, including trade name of the products along with the name and address of the manufacturers.
4. Specifications regarding installation requirements and sequence of construction, including a detailed bill of materials.
5. Detailed colored plan of the aesthetic treatment for the entire noise barrier.

Submit the following documents to the Bureau of Structures Design Section:

1. Three sets of design/shop drawings and one set of design calculations for review and acceptance. Any necessary revisions and/or corrections required for acceptance will be noted and returned to the contractor.

Design calculations shall be on 8½-inch x 11-inch sheets, neatly bound with a title sheet listing the complete project identification number and sound barrier designation. Design/shop drawings shall conform to the contract plans and the requirements of these special provisions. The design/shop drawings shall consist of plan and profile sheets, details, explanatory notes, erection diagrams, aesthetic treatments, and other working plans. All dimensions, sizes of material, material information and other information necessary for the complete fabrication and construction of the noise barrier should be designated on the appropriate sheets. The design/shop drawings shall be drawn to an appropriate scale on reproducible sheets 11 x 17-inches including borders. Each sheet shall carry the complete project identification number and noise barrier designation. Design/shop drawings and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

B.2.11 Review Process

All documents, including drawings, calculations and related material submitted for review will be given final acceptance by the engineer.

It is expressly understood that the engineer's review and acceptance of the drawings, calculations, and related material, submitted by the contractor, means only an acceptance of the character and sufficiency of the details, and does not relieve the contractor from responsibility in regard to errors or omissions on said submittals.

The final accepted design documents and/or shop drawings shall become a part of the contract. Any substitution of materials or dimensions contemplated by the contractor's submitted documents, different from materials or dimensions shown on the contract plans, shall be made only when approved by the engineer, and in such case, additional costs resulting from such substitution shall be borne by the contractor.

Ordering of materials by the contractor prior to acceptance of the submittal requirements shall be at the contractor's own risk.

B.3 Wall System Testing Requirements

All test reports required in section B.3 shall reference the specific facility which will be producing material for this contract. Test reports shall be representative of differing production lots on materials manufactured for this specific contract which is representative of the manufacturer's continuous production for wall systems. Panels tested or from which samples will be taken from shall be selected and appropriately marked by the engineer either at the manufactures' plant or from panels delivered to the project at the engineer's option. Test reports will be required for each lot of material not to exceed 100,000 SF of noise barrier produced. Testing shall be conducted on panels within the first 30,000 SF of production of each lot not exceeding 100,000 SF. For projects that do not exceed 100,000 SF, a minimum of two lots of material will represent the project, each lot representing equivalent square footage. The first set of tests conducted for projects that do not exceed 100,000 SF shall be within the first third of the total square footage of the project.

Products tested should be tested as a system under the requirements in B.3.1 and B.3.2; this includes stain intended for the supplied concrete and composite concrete components wall panels.

B.3.1 Noise Reduction Coefficient (NRC)

The noise barrier panel shall be tested in accordance to ASTM C423, and placed in accordance to ASTM E795, mounting type A, to determine the noise reduction coefficient (NRC) of the material. Submit to the engineer an independent testing laboratory test report that shows that the noise barrier panels achieve an NRC as specified for each side of the barrier.

B.3.2 Salt Scaling Resistance

All sound absorbing composite concrete and composite concrete components shall be tested for salt scaling resistance in accordance to ASTM C672 and the following modifications and/or requirements.

B.3.2.1 Test Specimens

For the purposes of the test, three specimens of a full cross section of the composite panel at least 12 inches x 12-inches shall be selected at random from the provided composite panel as defined in B.3. Sample specimens shall be from production panels as selected and marked by the engineer, representative of the manufacturer's continuous production operation.

The surfaces of the sample specimen(s) shall be prepared for testing as follows. Brush the surfaces of the sample to remove any loose particles. The test specimens shall then be submerged in water for a period of 24 hours prior to testing. Immediately following this, the specimens shall be covered with the sodium chloride solution as stated below.

B.3.2.2 Test Procedure

Place samples in a 5 sided water tight container in which a solution of sodium chloride (concentration 3% by mass) fully submerges the specimen. A ¼- inch of sodium chloride solution shall be maintained above the top surface of the fully submerged specimen within the container.

The specimens shall then be subjected to continuous freeze-thaw cycles as follows:

After each five cycles, the salt solution and particles of deteriorated concrete shall be removed from the slab and collected in a watertight container. The operation is best accomplished by tilting the slab in a funnel approximately 20-inches in diameter and washing the surface of the slab with a 3% sodium chloride solution. This washing should continue until all loose particles are removed from the concrete. The solution shall then be strained through a filter and the residue dried out at 221 degrees Fahrenheit to a constant mass condition. The residue shall be cumulatively weighed after each five cycles. This residue shall be defined as the loss of mass and expressed in pounds per square foot of exposed slab area. This is to exclude the concrete core for composite concrete panels in the calculation of the area used to express the mass loss per square foot. The loss of mass shall be calculated to the nearest 0.01 pounds per square foot. The surfaces should be rated in accordance to 10.1.5 of ASTM C672 including any delamination of the sound absorbing material from the concrete core for composite concrete materials. After the washing of each slab, a new solution of sodium chloride (concentration 3% by mass) shall be placed in the 5 sided water tight container to fully submerge the specimen to a depth of ¼-inch above the top surface of the fully submerged test specimen.

The test shall continue until 50 freeze-thaw cycles have been completed.

During the test each specimen shall be positioned and supported to allow free circulation of the test solution under, around, and over test pieces. The bottom of the specimens shall be supported on blocks in a manner to assure movement of moisture through and around the test specimen(s).

B.3.2.3 Test Report

Submit to the engineer an independent testing laboratory test report which shows that all solid and composite concrete products meet or exceed the following criteria:

a. After 50 freeze-thaw cycles the test specimens shall not exhibit excessive deterioration in the form of cracks, spalls, aggregate disintegration, delamentation, or other objectionable features.
b. Compliance with the test requirements is based upon a loss of mass of not more than 0.2 pounds per square foot from the surface after 50 cycles of freezing and thawing. The measured surfaces are not to include the exposed surface of any core material of a composite concrete component.
c. The report shall include the following:
    1. Name of manufacturer.
    2. Location of production.
    3. Production description.
    4. Date product sample was cast.
    5. Commencement date of testing.
    6. Specimen identification.
    7. 5x7-inch color photographs of the test specimens before and after the 50 cycles freeze-thaw test.
    8. A graph of the cumulative mass loss of each specimen plotted against the number of freeze-thaw cycles for 5, 10, 15, 20, 25, 30, 40, and 50 freeze-thaw cycles.
    9. Visual rating in accordance to 10.1.5 ASTM C672 including report of any delamination of the sound absorbing material from the concrete core for composite concrete components.

B.4 Wall Systems Material Requirement

Contractor shall provide certification of compliance to all applicable requirements in B.4. All material certifications shall reference the specific facility manufacturing the material and this contract. Certifications will be required for each lot of material not to exceed 100,000 SF of noise barrier produced. For projects that do not exceed 100,000 SF, a minimum of 2 lots of material will represent the project, each lot representing equivalent square footage.

B.4.1 Sound Transmission Loss (TL)

Submit to the engineer certification of compliance that the sound transmission loss of the panel material, when tested in accordance to ASTM Standard E90, achieves a transmission loss as specified in B.2.6.

B.4.2 Structural Steel

Submit to the engineer certification of compliance that structural steel galvanized after fabrication is in accordance to ASTM A123. Steel posts of post and panel walls shall be galvanized. Any galvanized surfaces exposed to view shall be coated with an approved paint system as referenced in B.2.8.

B.4.3 Accelerated Weathering

Submit to the engineer certification of compliance that all coatings on barrier components, with the exception of structural steel and wood components, comply with the following requirements when tested by ASTM Standard G155, G153, or G152 after 2400 hours of exposure on a cement based test specimen(s).

1. No checking when rated in accordance to ASTM D660.
2. No cracking when rated in accordance to ASTM D661.
3. No blistering when rated in accordance to ASTM D714.
4. No difference in adhesion between the unexposed control sample and an exposed sample when tested in accordance to ASTM D3359, Method A.
5. No chalking less than #7 rating when rated in accordance to ASTM D4214.
6. No color change greater than 5 NBS units when measured in accordance to ASTM D2244, using illuminant D65 and the 1964 10 degree standard observer.

B.4.4 Corrosion Resistance (Salt Fog Exposure)

Submit to the engineer certification of compliance that all coated steel components, with the exception of structural steel, has a coating system that has been tested for corrosion resistance in accordance to ASTM B117 and comply with the following requirements:

1. No checking when rated in accordance to ASTM D660.
2. No blistering when rated in accordance to ASTM D714.
3. No loss of adhesion when tested in accordance to ASTM D3359 with no evidence of corrosion along the edges of the samples or along the score lines or other defects.

B.4.5 Steel Panels

All steel panels shall be minimum nominal 20 gauge galvanized steel. The steel panels shall be free from laminations, blisters, slivers, open seams, pits from heavy rolled-in scale, ragged edges or other defects that may affect their appearance or use for the intended purpose. All shearing, cutting, and punching shall be done prior to preparation of the panels for application of coatings.

B.4.6 Aluminum Panels

All aluminum panels shall be minimum 0.063 inch nominal thickness or greater. The aluminum panels shall be free from laminations, blisters, slivers, open seams, pits from heavy rolled-in scale, ragged edges or other defects that may affect their appearance or use for the intended purpose. All aluminum panels shall conform to the thickness tolerances of the Aluminum Association, Inc. All shearing, cutting, and punching shall be done prior to preparation of the panels for application of coatings.

B.4.7 Timber Components

All lumber and timber furnished for the work shall be in accordance to the requirements of standard spec 507 and as hereinafter specified.

B.4.7.1 Species of Wood

All lumber and timber, with the exception of Glue Laminated Timber, shall be from one of the following species: Douglas Fir-Larch, Southern Pine, and Hem-Fir.

Glue laminated timber shall be Southern Pine.

B.4.7.2 Preservative Treatment

All timber components shall receive a chemical preservative treatment. The wood shall be dried to 19% or less prior to treatment. The wood shall be treated using a chromated-copper arsenate solution in accordance to standard spec 507.2.2.6. After treatment, all wood having nominal dimensions less than 3-inches by 3-inches shall be air or kiln dried to a maximum moisture content of 15%. Wood in greater dimensions shall be dried to maximum moisture content of 19%. The required Certificate of Preservative Treatment shall indicate compliance with the maximum moisture content requirement(s), in addition to requirements of the preservative treatment specifications herewith set forth. Wood shall be protected from increases in moisture content until incorporated into the work.

B.4.7.3 Glue Laminated Timber

Glue laminated timber shall contain the mark of a recognized inspection agency as being in conformance with ANSI/AITC A190.1. A wet-use adhesive suitable for use with treated wood as shown in ANSI/AITC A190.1 shall be used. Members shall be of Industrial appearance grade per AITC 110.

Lumber to be glue laminated shall be pressure preservative treated prior to gluing to a retention of 0.4 pounds per cubic foot.

B.4.7.4 Lumber

Non-laminated timber shall not exceed the proportion of six (nominal width) to one (nominal thickness) and shall be No. 1 grade or better. Sound knots shall extend through members no farther than 50 percent of the cross-section width. Unsound knots are not permitted. Knots are not permitted in the fastening area of any member.

B.4.7.5 Plywood

Plywood shall be exterior type conforming to the provisions of the US Product Standards PS-1 and shall bear the mark of a qualified and approved inspection and testing agency.

B.4.7.6 Sealant/Stain

All wood components of the barrier system shall be coated with a wood sealer/stain as hereinafter provided.

The manufacturer shall select a sealer/stain from one of the sources on the department's approved product list. Product data sheets shall be provided which indicate the mixing directions and recommended method(s) of application. The method and rate of application shall be as recommended by the producer.

B.4.7.7 Hardware and Fasteners

All hardware and fastening devices shall be either hot dipped galvanized steel or made of nonferrous or stainless steel. Fastening devices shall be screws; no nails or staples shall be allowed.

B.4.7.8 Mineral Fiber Material

Mineral fiber material used to increase sound absorption shall be manufactured in accordance to Federal Specification HH-1-558B and ASTM C612. Mineral fiber material shall have a minimum density of 6 pounds per cubic foot, shall absorb less than 1 percent of water when tested in accordance to ASTM C553, be non-corrosive, and nonhygroscopic. The mineral fiber material shall be fastened to the noise barrier system in a manner to prevent sagging when in a saturated condition.

C Construction

C.1 General

Construct the noise barriers at the locations shown on the plans, in accordance to the contract specifications and design drawings and/or as directed by the engineer. All sound absorbing composite concrete components shall be delivered to the project site(s) as a finished component. A sound absorbing composite concrete system, which has the sound absorbing material glue-laminated or alternately affixed by a secondary adhesion method on the project site, will not be allowed.

Provide a minimum ten day notice to the engineer of the date that the fabrication of the noise barrier material will commence. Certifications and test reports will be required for each lot of material not to exceed 100,000 SF of noise barrier produced. For projects that do not exceed 100,000 SF a minimum of 2 lots of material will represent the project, each lot representing equivalent square footage.

Panels from which samples will be taken from for testing required in B.3 shall be selected and appropriately marked by the engineer either at the manufactures' plant or from panels delivered to the project at the engineer's option. Test reports will be required for each lot of material not to exceed 100,000 SF of noise barrier produced. Testing shall be conducted on panels within the first 30,000 SF of production of each lot not exceeding 100,000 SF. For projects that do not exceed 100,000 SF, a minimum of two lots of material will represent the project, each lot representing equivalent square footage. The first set of tests conducted for projects that do not exceed 100,000 SF shall be within the first third of the total square footage of the project.

Inspect all materials delivered to the construction site for proper dimensions, honeycombing, cracks, voids, surface defects, consistency in color and texture, and any other damage or imperfections, prior to installation.

If any part of the noise barrier material fails to comply with any requirements of the contract specification, the component shall either be corrected, permanently marked as unacceptable and be disposed of by the contractor or accepted at a reduced price. The decision will be made by the engineer and is dependent on the severity of the specification deviation.

C.2 Fire Hydrant Location Signs

Furnish and install fire hydrant location sign(s). These shall be attached to the noise barrier at each location shown on the plans by a method as shown on the department approved drawings. The signs shall conform and be of the type specified in the department's sign plate book, plate D9-54 and/or D9-54A.

Compensation for furnishing and placing the fire hydrant location signs shall be included in the contract price for Noise Barriers Double-Sided Sound Absorptive and no additional compensation therefore will be allowed.

C.3 Name Plates

Furnish and install name plates conforming to the requirements of standard spec 506.2.4.

Furnish and place one name plate on each noise barrier at the location indicated on the plans.

Rigidly attach each plate to the barrier by a means approved by the engineer.

Compensation for furnishing and placing of name plates shall be included in the contract price for Noise Barriers, Double-Sided Sound Absorptive Structure and no additional compensation therefore will be allowed.

C.4 Structure Mounted Noise Barriers

Do not erect noise barriers mounted to bridge or retaining wall structures until after the concrete masonry for bridge decks and parapets or retaining wall moment slabs and parapets have attained their specified 28-day strength.

For noise barriers mounted to moment slabs and parapets on top of MSE retaining walls, erection of the noise barrier is limited to two-thirds of the height of the noise barrier acoustical line shown in the plans prior to placement of earth fill or pavement over the top of the moment slab as shown in the plans. Erection of the noise barrier in excess of two-thirds its height to the full height of the noise barrier acoustical line shown on the plans may not occur until after the earth fill or pavement structure over the top of the moment slab shown in the plans is complete.

C.5 Tolerances The posts and panels comprising the noise barrier shall be installed plumb within ½-inch of vertical in 15-feet. The posts shall be located to the line and grades as shown in the plans to within +/- ¾-inch. Horizontal joints of adjacent panels shall be lined up to a vertical tolerance of ¼-inch. Where vertical adjustments are required for alignment, a mortar base or steel shims shall be used. Galvanize and prime coat steel shims in accordance to B.2.8.

D Measurement

The department will measure Noise Barriers Double-Sided Sound Absorptive (Structure), as set forth in the contract plans without measurement thereof according to the Pay Plan Quantity article. Any modifications to the contract quantity caused by corrections or revisions of the original contract plan, which have been approved by the engineer, will be measured by the square foot. This area in square feet will be determined by measuring the length in linear feet along the faces of the noise barrier, and height in linear feet from bottom to top of the noise barrier, then multiplying the measured length by the measured height, and the contract quantity will be adjusted accordingly to determine the final pay quantity.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
531.0300.S.0001	Noise Barriers Double-Sided Sound Absorptive N-40-62	SF
531.0300.S.0002	Noise Barriers Double-Sided Sound Absorptive N-40-68	SF
531.0300.S.0003	Noise Barriers Double-Sided Sound Absorptive N-40-69	SF
531.0300.S.0004	Noise Barriers Double-Sided Sound Absorptive N-40-70	SF
531.0300.S.0005	Noise Barriers Double-Sided Sound Absorptive N-40-71	SF
531.0300.S.0006	Noise Barriers Double-Sided Sound Absorptive N-40-72	SF
531.0300.S.0007	Noise Barriers Double-Sided Sound Absorptive N-40-73	SF
531.0300.S.0008	Noise Barriers Double-Sided Sound Absorptive N-40-74	SF
531.0300.S.0009	Noise Barriers Double-Sided Sound Absorptive N-40-75	SF
531.0300.S.0010	Noise Barriers Double-Sided Sound Absorptive N-40-80	SF
531.0300.S.0011	Noise Barriers Double-Sided Sound Absorptive N-40-81	SF

Payment is full compensation for preparing the design drawings and calculations; supplying and delivering samples and test barrier panels as required in B.2.5 and B.3; furnishing all labor, equipment, and materials required for the manufacture, testing, supply, and delivery of the noise barrier material including aesthetic patterns on panel and coloring; furnishing all labor, tools, equipment, and materials required to construct the noise barriers, including site preparation, all necessary excavation, disposing of materials, constructing foundations, and erecting posts and panels.

531-010 (20110615)

84. Driven Piles Using Pile Dynamic Analyzer.

Where indicated in the structure plans, replace standard spec. 550.3.6 with the following:

550.3.6 Driving Resistance

- Drive piles to the depths necessary to obtain the required driving resistance per the driving resistance determination method called for in the plans.

- Driving resistance will be developed by the engineer from Pile Dynamic Analyzer (PDA) testing performed on the designated piles at each substructure unit as shown on the plans. The driving criteria will be given as blows per foot with hammer stroke and minimum penetration of the pile or as directed by the engineer.

The PDA test piles at each substructure unit are designated on the plans and will be monitored using a PDA. Pile installation for these test piles will be controlled by the PDA testing and the engineer per the Pile Dynamic Analyzer (PDA) Testing and Restrike Special Provision within this contract.

For the PDA driving resistance determination method, pile restrikes will be required per the PDA Testing and Restrike Special Provision, or as directed by the engineer. Accommodate a time delay in the pile driving sequence as defined in the PDA Testing Special Provision to allow the engineer time to develop the production pile driving criteria.

- If the required driving resistance is not met at the minimum tip elevation, driving shall continue until it is achieved. If the required driving resistance is achieved above the minimum tip elevation, driving shall continue until both the minimum tip elevation and required driving resistance criteria are met. If practical pile refusal is encountered prior to the minimum tip elevation, the engineer will determine if driving can be halted.

Where indicated in the structure plans, delete standard spec. 550.3.7.

85. Storm Sewer Pipe 10-Inch, Item 607.0600.S.0001.

A Description
This special provision describes furnishing and installing storm sewer in accordance to standard spec 607 and standard spec 608, as shown on the plans, and as hereinafter provided.

B Materials
Supplement standard spec 607.2 and standard spec 608.2 as follows:

The contractor may elect to furnish either corrugated High Density Polyethylene (HDPE) pipe, corrugated polyvinyl chloride (PVC) pipe, steel spiral rib (SSR) pipe, nonreinforced

concrete pipe, composite pipe or reinforced concrete pipe. Storm sewer will be accepted on the basis of a Manufacturer's Certificate of Compliance and WisDOT field inspection upon delivery to a project.

Corrugated HDPE pipe and fittings shall conform to the requirements of the Specifications for Corrugated Polyethylene Pipe, 12 to 36 inch Diameter, AASHTO Designation: M 294, Type S; and the Specifications for Corrugated Polyethylene Drainage Tubing, AASHTO Designation: M 252-92, Type S, for 8 and 10 inch diameter pipe. Joint connections shall include gaskets as recommended by the manufacturer.

Corrugated PVC pipe and fittings shall conform to the requirements of Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings, ASTM Designation: F949. Joint connections shall include gaskets as recommended by the manufacturer.

Steel spiral rib pipe and fittings shall conform to the requirements of the Standard Specifications for Corrugated Steel Pipe, Polymer Precoated, for Sewers and Drains, AASHTO Designation M245M, Type IR. The grade of polymer coating shall be 250/250. The thickness of the steel sheet shall be as specified in the plans. Couplings shall be furnished and assembled with gaskets in accordance to AASHTO M246M/M.

C Construction

Supplement standard spec 607.3 for corrugated HDPE pipe, corrugated PVC pipe and steel spiral rib pipe as follows:

Joints for sewer pipe shall be sealed to be soil tight in accordance to AASHTO Standard Specifications for Highway Bridges, section 26.4.2.4(e).

The contractor shall be responsible for the protection of all storm sewer pipes until final acceptance of the work and any pipe that is damaged either through the contractor's operations or due to the contractor's failure to properly protect the same, shall be replaced in kind at no expense to the department.

Supplement standard spec 607.3.5 for corrugated HDPE pipe as follows:

Backfill immediately all trenches and excavations after the sewers have been constructed therein. Use backfill that meets the requirements for Granular Backfill in standard spec 209, except that all such material placed around the pipe and to 6 inches, above the pipe shall pass a 1-inch sieve.

D Measurement

The department will measure Storm Sewer Pipe (Size) in length by the linear foot in accordance to standard spec 607.4.1.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
607.0600.S.0001	Storm Sewer Pipe 10-Inch	LF

Payment is full compensation for performing the work as described in standard spec 607.5.1; furnishing, operating, and maintaining a mandrel; performing the mandrel testing; and performing all necessary corrective actions and corrective work associated with the mandrel testing, if mandrel testing is required.

86. Storm Sewer.

Supplement standard spec 204.3.2.2 with the following:

(15) Material placed within storm sewer trenches is subject to the quality control for the zone that the material is located in and shall conform to QMP Subgrade article listed elsewhere in this special provision document.

Supplement standard spec 204.5.1 General with the following:

(7) QMP sampling, testing and documentation is incidental to removing storm sewer bid item and no separate payment will be made.

Supplement standard spec 607.3.1.1 General with the following:

(9) Review the Plans, Specifications, and existing site conditions prior to bidding to ascertain the extent of the work requiring shoring.
(10) Exercise additional caution when constructing sewers in close proximity to utilities, structures, and live traffic lanes.
(11) Proposed utilities are not shown on the plans. Review "Utilities" article for abandoned, relocated, adjusted, and/or new utility facilities prior to bidding.
(12) To facilitate drainage, maintain concrete barrier temporary precast drainage/lifting slot holes free from debris.
(13) Provide a shoring design and installation sequence for each location when shoring is used. Have a professional engineer, registered in the State of Wisconsin and knowledgeable of the specific site conditions and requirements verify the adequacy of the design. Submit one electronic copy in portable document format of each shoring design, signed and sealed by the same professional engineer verifying the design, to the engineer for incorporation into the permanent project record.
(14) Shop drawings shall be prepared, verified and stamped by a professional engineer registered in the State of Wisconsin for all storm sewer structures. Submit one electronic copy of shop drawings in portable document format for engineer's review two weeks prior to start fabrication. Show clearly on shop drawings information for all pipe connections to the structure. The contractor is responsible for all errors of detailing and fabrication. The omission from the shop drawings of any pipe connection shall not relieve contractor of the

responsibility of furnishing and installing such materials, even though the shop drawings may have been and reviewed and accepted by the engineer.

Replace standard spec 607.3.5(1) Backfilling with the following:

Conform to backfill detail as shown on the plan. Backfill all trenches and excavations of all new storm sewer and storm sewer structures not occupied by Backfill Controlled Low Strength or stone chips immediately after completing the sewer work with backfill material conforming to standard spec 209. Backfill locations where existing storm sewers and or existing storm sewer structures have been called for removal or abandoning, not occupied by the new roadway structure or occupied by Backfill Controlled Low Strength or stone chips, immediately after completing the sewer work with backfill material conforming to standard spec 209.

Supplement standard spec standard spec 607.3.5 Backfilling with the following:

(8) Material placed within storm sewer trenches is subject to the quality control for the zone that the material is located in and shall conform to QMP Subgrade article listed elsewhere in this special provision document.

Supplement standard spec standard spec 608.3 with the following:

Provide factory lubricated rubber gasket joints for all storm sewer pipes.
Place factory lubricated gasket over the spigot end or tongue of the entering pipe. Clean the gasket and the ends of the pipe from sand and gravel. Place the spigot or tongue of the pipe being laid with the gasket in place into the bell or groove end of the previously laid pipe. Set pipe carefully to line and grade, and push or jack home. The engineer can order the use of a jack or "come-along" if deemed necessary to ensure that the joints are completely tight.

Place rubber gasket over the spigot end or tongue of the entering pipe. Clean the gasket and the ends of the pipe from sand and gravel. Immediately before making the joint, lubricate the outside of the gasket and the inside of the bell or groove of the last pipe with an approved vegetable lubricant. Place the spigot or tongue of the pipe being laid with the gasket in place into the bell or groove end of the previously laid pipe. Set pipe carefully to line and grade, and push or jack home. The engineer can order the use of a jack or "come-along" if deemed necessary to ensure that the joints are completely tight.

Replace standard spec 608.5(2) with the following

Payment for the Storm Sewer Pipe bid items is full compensation for providing all materials, including all special Y's, mitered sections, elbows and connections required; for excavating and wasting excess material, except rock excavation; for providing factory lubricated gaskets; for supporting utilities in storm sewer trench; for shoring design, providing a signed and sealed copy of the design; for installation, monitoring, and removal of shoring; for forming foundation; for laying pipe; for sealing joints and making

connections to new or existing features; stone chips; granular backfill material, including bedding material; for backfilling; for QMP sampling, testing and documentation; for maintaining concrete barrier temporary precast drainage/lifting slot holes to keep free from debris; for cleaning out; and absent the pertinent contract bid items, for restoring the work site.

87. Stone Chips.

A Description

This work shall consist of furnishing and placing stone chips for storm sewer pipes and storm sewer structures as shown on the plans.

B Materials

Use crushed stone chips made from crushing sound limestone, dolomite ledge rock, or other rock materials of regional significance. Furnish hard, tough and durable material free from unconsolidated overburden materials, topsoil, organic materials, and other deleterious materials. Provide material that 85% to 100% of the particles have at least one machine fractured face. Crushed pea gravel will be acceptable if it meets these criteria.

Conform to following gradation for pipes 18-inches in diameter or less.

Gradation Requirements for 3/8-inch crushed stone chips
(ASTM C33-Size No. 8)

Sieve Size	% passing by weight
1/2-inch	100
3/8-inch	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5

Conform to following gradation for pipes greater than 18-inches in diameter.

Gradation Requirements for 3/4-inch crushed stone chips
(ASTM C33-Size No. 67)

Sieve Size	% passing by weight
1-inch	100
3/4 -inch	90-100
3/8-inch	20-55
No. 4	0-10
No. 8	0-5

OR

Gradation Requirements for 3/4-inch crushed stone chips
(ASTM C33-Size No. 6)

Sieve Size	% passing by weight
1-inch	100
3/4 - inch	90-100
1/2 -inch	20-55
3/8-inch	0-15
No. 4	0-5

C Construction

Prior to placement of stone chips provide for positive drainage of the area to be backfilled.

Material placed within storm sewer trenches is subject to the quality control for the zone that the material is located in and shall conform to QMP Subgrade article listed elsewhere in this special provision document with the exception of degree of compaction which is provided herein. Non-conforming stone chips will be replaced at no additional cost to the department.

The compaction of stone chips must be performed with at least two passes of a vibratory compactor in two mutually perpendicular directions (at least 4 passes total), such that with additional compactive effort, no further densification is obtained as visually determined by the engineer. If additional densification is observed after three passes in the two directions, then the material must be re-compacted until no further visual densification is observed. Density testing is not required for stone chips.

D (Vacant)

E Payment

Stone chips used for storm sewer pipes and storm sewer structures shall be included under appropriate bid items for pipes and structures. No separate payment will be made for stone chips.

88. Catch Basins, Manholes, and Inlets.

Supplement standard spec 611.3.3 with the following:

(5) Use monolithic concrete shimming as shown on plans for final adjustment of drainage structures located within concrete pavement, concrete curb and gutter and concrete barrier wall.

Supplement standard spec 611.3.6.1 General with the following:

Use a Grade "A" concrete for final adjustment of manhole cover.

(4) Conform to storm sewer concrete collar detail for storm sewer pipes to structure connections as shown on the plan.
(5) Provide a butyl rubber gasket or butyl rubber rope for joints of precast reinforced concrete manhole sections. Butyl Rubber gasket joint used for manholes conforms to 8.41.6 of the Standard Specification for Sewer and Water Construction in Wisconsin, latest Edition.
(6) Provide non-rocking covers for all drainage structures subject to traffic loading. Cost is incidental to new cover on proposed structure or reconstructing/adjusting manholes or inlets on existing structure.

Supplement standard spec 611.3.7 with the following:

(4) Adjustments of 4-inches or more in height shall be constructed using concrete grade rings. Grade rings less than 2-inches in thickness are not allowed.

Replace standard spec 611.5.2 (1) with the following:

(1) Payment for Catch Basins, Manholes, and Inlets bid items is full compensation for providing all materials, including all masonry, for Grade "A" concrete adjustments and monolithic concrete shimming; conduit and sewer connections, steps, and other fittings; for providing and installing butyl rubber joints; for furnishing all excavating, backfilling, disposing of surplus material, and for cleaning out and restoring the work site; except that the department will pay for covers, including frames, grates and lids separately.

89. Cover Plates Temporary, Item 611.8120.S.

A Description
This special provision describes furnishing, installing and removing a steel plate to cover and support asphaltic pavement and traffic loading at manholes, inlets and similar structures during milling and paving operations.

B Materials
Provide a 0.25-inch minimum thickness steel plate that extends to the outside edge of the existing masonry.

C (Vacant)

D Measurement
The department will measure Cover Plates Temporary as units, acceptably completed in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
611.8120.S	Cover Plates Temporary	Each

Payment is full compensation for furnishing, installing, and removing the cover plates.

The steel plates shall become the property of the contractor when no longer needed in the contract work.
611-006 (20030820)

90. Pipe Grates, Item 611.9800.S.

A Description
This special provision describes furnishing and installing pipe grates on the ends of pipes as shown in the plans, and as hereinafter provided.

B Materials
Furnish steel conforming to the requirements of standard spec 506.2.2.1. Furnish steel pipe conforming to the requirements of standard spec 506.2.3.6.

Furnish pipe grates galvanized according to ASTM A123.

Furnish angles and brackets galvanized according to ASTM A123.

Furnish required hardware galvanized according to ASTM A153.

C Construction
Repair pipes, rods, angles and brackets on which the galvanized coating has been damaged in accordance to the requirements of AASHTO M36M.

D Measurement
The department will measure Pipe Grates in units of work, where one unit is one grate, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
611.9800.S	Pipe Grates	Each

Payment is full compensation for furnishing and installing all materials; and for drilling and connecting grates to pipes.
611-010 (20030820)

91. Insulation Board Polystyrene 4-Inch, Item 612.0902.S.0001.

A Description
This special provision describes furnishing and placing polystyrene insulation board as shown on the plans and as hereinafter provided.

B Materials
Provide polystyrene insulation board that conforms to the requirements for Extruded Insulation Board, AASHTO Designation M230, except as hereinafter revised.

Delete flammability requirement.

B.1 Certification
Before installation, obtain from the manufacturer a certification indicating compliance and furnish it to the engineer.

C (Vacant)

D Measurement
The department will measure Insulation Board Polystyrene (4-inch) by area in square yards of work, completed and accepted.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
612.0902.S.0001	Insulation Board Polystyrene 4-Inch	SY

Payment is full compensation for furnishing all excavation; and for furnishing and placing the insulation board.
612-005 (20030820)

92. Crash Cushions Permanent Low Maintenance and Crash Cushions Temporary.

Complete work in accordance to standard spec 614.

Replace standard spec 614.2.7 with the following:

Use Model SCI 100GM Crash Attenuator from Smart Cushion Innovations (SCI) Products for permanent and temporary crash cushions.

93. Fence Safety, Item 616.0700.S.

A Description
This special provision describes furnishing and installing a plastic fence at locations shown on the plans and as hereinafter provided.

B Materials
Furnish notched conventional metal “T” or “U” shaped fence posts.

Furnish fence fabric meeting the following requirements:

Color:	International orange (UV stabilized)
Roll Height:	4 feet
Mesh Opening:	1 inch min to 3 inch max
Resin/Construction:	High density polyethylene mesh
Service Temperature:	-60° F to 200° (ASTM D648)
Tensile Yield:	Avg. 2000 lb per 4 ft. width (ASTM D638)
Ultimate Tensile Strength:	Avg. 3000 lb per 4 ft. width (ASTM D638)
Elongation at Break (%):	Greater than 100% (ASTM D638)
Chemical Resistance:	Inert to most chemicals and acids

C Construction
Drive posts into the ground 12 to 18 inches. Space posts at 7 feet.

Use a minimum of three wire ties to secure the fence at each post. Weave tension wire through the top row of strands to provide a top stringer that prevents sagging.

Overlap two rolls at a post and secure with wire ties.

D Measurement
The department will measure Fence Safety by the linear foot along the base of the fence, center-to-center of posts, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
616.0700.S	Fence Safety	LF

Payment is full compensation for furnishing and installing fence and posts; maintaining the fence and posts in satisfactory condition; and for removing and disposing of fence and posts at project completion.
616-030 (20070510)

94. Seeding.

Add the following to standard spec 630.3.3:

(1) This work includes seeding turf grass and providing proper care of all newly seeded areas for a period of two growing seasons.

(2) Proper care of seeded areas consists of weeding, fertilizing, watering, repair of eroded areas, repair of mulch or erosion mats, mowing grass once it reaches a height of 6-7 inches.

(3) Weeding consists of physically or chemically removing large sized (over 12" tall) weeds throughout the first growing season. Chemical removal shall consist of spot applications of a Glyphosate with a surfactant during the first year of maintenance.

Any overspray shall be confined to an area less than 2 feet in diameter. Contractor shall mark the overspray area and return in one week to reseed and water. Seed mix and application rate shall be the same as the original seeding.

Contractor shall comply with all federal and state laws regarding safety, handling, applying and disposal of materials and/or containers.

(4) During the spring of the second season apply a liquid fertilizer-herbicide combination (weed and feed) when grass and weeds are actively growing. Apply when temperatures are between 55 and 75 degrees. Do not apply when wind speeds are greater than 5 mph to avoid overspray onto adjoining properties.

Place notice markers in the treated turf areas indicating that a fertilizer-herbicide has been applied and the date applied.

(5) Water seeded areas sufficiently to maintain the soil moisture at a pre-determined level set by the engineer. Moisture level shall be measured by an electronic soil moisture gauge. Contractor to provide their own moisture gauge.

Engineer's and contractor's moisture shall be calibrated with each other. Contractor shall provide a chart of the two meter's corresponding numbers after calibration.

(6) Inspect seeded areas after periods of rain. Report any erosion areas to the engineer and make the necessary clean-up of deposited soil (due the erosion), fill eroded areas to match surrounding grades, seed and mulch repaired areas

(7) Perform maintenance site visit requirements to the satisfaction of the engineer a minimum of once every two weeks for the months of May through October

(8) Notify the Engineer at least two days before making a maintenance site visit

(9) Submit a written report to the engineer after each maintenance site visit. Ensure that the report documents the work performed during each visit; the number and location of bare spots, the amount of seed and mulch applied; and other information the engineer deems appropriate

(10) Mow grass once it has reached a height of 6-7 inches. Mow to a height of 4 inches. Repeat mowing when grass for the duration of the maintenance period

(11) Grass seeding in healthy condition at the end of the second growing season must cover 95% or greater, of the total seeded area

(12) One month prior to the end of the applicable turf seeding establishment period, the engineer will make a final inspection and accept or reject seeded areas not meeting coverage requirements.

Replace standard specs 630.3.3.6 (1) and (3) with the following:

(1) This work includes seeding native grass and providing proper care of all newly seeded areas for a period of two growing seasons

(2) Seeding native grasses consists of sowing and establishing a healthy stand of the seed mix specified and providing proper care of seeded areas (seed mixes: 70, 70A 75, 80 and other native seed mixes with varying percentages of seed species) for a period of two growing seasons.

(3) All work shall be performed by personnel familiar with accepted native landscape maintenance procedures. Qualified foreman, representing the contractor, shall be on-site during seeding and maintenance procedures.

(4) Proper care of native seeded areas consists of weeding, watering, repair of eroded areas, repair of mulch and erosion mats

(5) Weeding consists of physically or chemically removing weeds throughout the first and second growing season. Chemical removal shall consist of spot applications of a Glyphosate with a surfactant. Apply in a manner that does not affect the adjoining healthy native grasses

Contractor shall comply with all federal and state laws regarding safety, handling, applying and disposal of materials and/or containers

(6) Water seeded areas sufficiently to keep the soil moisture at a pre-determined level set by the engineer. Moisture level shall be measured by an electronic soil moisture gauge. Contractor to provide their own moisture gauge

Engineer's and contractor's moisture shall be calibrated with each other. Contractor shall provide a chart of the two meter's corresponding numbers after calibration

(7) Inspect seeded areas after periods of rain. Report any erosion areas to the engineer and make the necessary clean-up of deposited soil (due the erosion), fill eroded areas to match surrounding grades, seed and mulch repaired areas.

(8) Perform maintenance site visit requirements to the satisfaction of the engineer a minimum of once every two weeks for the months of May through October.

(9) Notify the Engineer at least two days before making a maintenance site visit

(10) Submit a written report to the engineer after each maintenance site visit. Ensure that the report documents the work performed during the care cycle; the number and location of bare spots, the amount of seed and mulch applied; and other information the engineer deems appropriate.

(11) Mow native seeding to height of 10 inches at the end of the second growing season.

(12) Properly care for native seeding from the time of planting until final acceptance of the work.

(13) Native seeding must be in healthy condition at the end of the second growing season and must cover 95% or greater, of the total seeded area

(14) One month prior to the end of the applicable native plant establishment period, the engineer will make a final inspection of the native planting and accept or reject seeded areas not meeting coverage requirements.

95. Furnishing and Planting Plant Materials.

Add the following to standard spec 632.2.2.1 (1):

All plants shall be grown within the states of Wisconsin, Minnesota, Michigan, or parts of northern Illinois located within Zone 5 of the "Plant Hardiness Zone Map" produced by the United States Department of Agriculture, Miscellaneous Publication No. 1475, issued January, 2012.

96. Landscape Planting Surveillance and Care Cycles.

Modify standard spec 632.3.19.2 to include the following:

If the care specialist fails to perform any of the required care-cycles as specified in standard spec 632.3.19.1, the department will assess daily damages in the amount of $500 per day to cover the cost of performing the work with other forces.

97. Sign Supports Concrete Masonry.

Add the following to standard spec 636.3.2:

(3) Drill or excavate and maintain a stable open excavation for subsequent installation of drilled footings for sign structure foundations as shown in the plans. The subsurface conditions vary across the project site and are not necessarily the same at each sign structure foundation in the project. Anticipate the possibility of encountering randomly interlaced seams of loose, permeable sand or gravel of substantial thickness situated within glacial clays and till deposits; saturated soils; ground water; isolated cobbles or boulders; and nested cobbles and boulders at any sign structure foundation when selecting equipment and methods for drilling or otherwise excavating. Partial or full

depth temporary casing may be required to maintain the stability of the excavation prior to placement of reinforcement and filling the excavation with concrete.

It is strongly advised to obtain and review the Geotechnical Exploration and Foundation Evaluation Reports for the sign structures and as well as nearby structures to the sign structure foundation being constructed. See article "Geotechnical Investigation Information" in these special provisions for information on obtaining geotechnical reports.

(4) Obstructions are defined as man-made objects that when encountered, stop or significantly impede downward progress of the excavation to less than 12-inches for 60 minutes or longer using conventional excavation techniques or augers operating at normal power, torque and downward thrust. Obstructions include man-made objects and may include, but are not limited to old concrete foundations, piling, abandoned utilities or buried pavements. Obstructions are further classified as "known obstructions" which are identified on the plans, and "unknown obstructions" that may be encountered but are not identified on the plans.

Employ special tools and/or procedures as necessary when obstructions are encountered and the contractor cannot advance the excavation more than 12-inches in 60 minutes using conventional earth augers operating at normal power, torque, and down thrust. Clear the obstructions in such a manner so as not to compromise the sidewall integrity or stability of the drilled, open hole. Special procedures and tools that may be required include, but are not limited to; chisels, breakers, core barrels, air hammer tools, and hand excavation. Other methods for obstruction removal such as temporary casing or hole diameter increase can be employed to aid in the removal if acceptable to the engineer. Blasting is not permitted.

Natural deposits, including boulders, cobbles, nested cobbles and other deposits may be encountered that impede the excavation to less than 12-inches for 60 minutes or longer as noted above for obstructions. Natural deposits, regardless of makeup, depth, configuration, and consistency are not classified as obstructions as defined in this special provision or in the special provision Obstructions Sign Supports Concrete Masonry included in this contract.

Add the following standard spec to 636.3.3:

(8) For drilled foundations, no more than 3 inches of standing water is permitted in the bottom of the drilled excavation immediately prior to placing concrete masonry in the excavation.

Replace standard spec 636.5.2(1) with the following:

Payment for Sign Supports Concrete Masonry is full compensation for providing, transporting, placing and curing the concrete; for providing and removing casing if applicable; for providing required ground rods; for furnishing all required excavating; for

clearing natural and known man-made obstructions; for placing post stubs or anchor bolts, and for providing and placing electrical conduit if required; for pumping of ground water seepage if applicable; for cleaning-up, repairing damage, and for disposing of excavation and surplus materials.

Removal of unknown man-made subsurface obstructions for Sign Supports Concrete Masonry will be measured and paid for separately under the bid item, Obstructions Sign Supports Concrete Masonry included in the contract.

98. Signs Type I and II.

Furnish and install new mounting brackets per approved product list for type II signs on overhead sign supports incidental to sign. For type II signs on sign bridges use aluminum vertical support beams noted above incidental to sign. New mounting brackets are incidental to the sign being installed.

Modify standard spec 637.2.4 with the following:

Use stainless steel bolts, washers and nuts for type I and type II signs mounted on sign bridges or type I signs mounted on overhead sign supports. Use clips on every joint for Sign Plate A 4-6 when mounted on a sign bridge or overhead sign support. Inspect installation of clips and assure bolts and nuts are tightened to manufacturers recommended torque values.

Use aluminum vertical sign support beams that have a 5-inch wide flange and weigh 3.7 pounds per foot, if the L-brackets are 4 inches wide then use 4 inch wide flange beams weighing 3.06 pounds per foot. Contractor shall measure the width of the L-brackets on existing structures of determine the width needed for sign support beams

Use beams a minimum of 6 feet in length or equal to the height of the sign to be supported, whichever is greater. Use U-bolts that are made of stainless steel, 1/2 inch diameter and of the proper size to fit the truss cords of each sign bridge. Install vertical sign support beams on each sign and use new U-bolts to attach each beam to the top and bottom cord of the sign bridge truss.

For type II signs on overhead sign supports follow the approved product list for mounting brackets.

Replace standard spec 637.2.4.1(2)2 with the following:

Clips may be either stainless steel or ASTM B 108, aluminum alloy, 356.0-T6.

Append standard spec 637.3.2.1(3) with the following:

Provide the engineer with 3 copies of drawings of the signs proposed to be furnished under this contract for approval.

Append standard spec 637.3.3.2(2) with the following:

Install Type I Signs at the offset stated in the plan, which shall be the clear distance between the edge of mainline pavement right edgeline and the near edge of the sign.

Append standard spec 637.3.3.3(3) with the following:

Furnish and install new aluminum vertical sign support beams on each sign and new U-bolts to attach each beam to the top and bottom cord of the sign bridge truss for Type I or Type II Signs and Type I signs on overhead sign supports incidental to sign. New I-beams are incidental to the sign being installed.
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99. Sign Bridge Single Pole Sign Support One Sign S-40-788, Item 641.0100.0001; Sign Bridge Single Pole Sign Support One Sign S-40-789, Item 641.0100.0002; Sign Bridge Single Pole Sign Support Two Signs S-40-790, Item 641.0600.0001; Sign Bridge Cantilevered S-40-28, Item 641.1200.0001; Sign Bridge Cantilevered S-40-65, Item 641.1200.0002; Sign Bridge Cantilevered S-40-85, Item 641.1200.0003; Sign Bridge Cantilevered S-40-118, Item 641.1200.0004; Sign Bridge Cantilevered S-40-119, Item 641.1200.0005; Sign Bridge Cantilevered S-40-124, Item 641.1200.0006; Sign Bridge Cantilevered S-40-129, Item 641.1200.0007; Sign Bridge Cantilevered S-40-130, Item 641.1200.0008; Sign Bridge Cantilevered S-40-131, Item 641.1200.0009; Sign Bridge Cantilevered S-40-134, Item 641.1200.0010; Sign Bridge Cantilevered S-40-137, Item 641.1200.0011; Sign Bridge Cantilevered S-40-146, Item 641.1200.0012; Sign Bridge Cantilevered S-40-158, Item 641.1200.0013; Sign Bridge S-40-22, Item 641.6600.0001; Sign Bridge S-40-27, Item 641.6600.0002; Sign Bridge S-40-43, Item 641.6600.0003; Sign Bridge S-40-44, Item 641.6600.0004; Sign Bridge S-40-47, Item 641.6600.0005; Sign Bridge S-40-50, Item 641.6600.0006; Sign Bridge S-40-51, Item 641.6600.0007; Sign Bridge S-40-87, Item 641.6600.0008; Sign Bridge S-40-104, Item 641.6600.0009; Sign Bridge S-40-116, Item 641.6600.0010; Sign Bridge S-40-117, Item 641.6600.0011; Sign Bridge S-40-121, Item 641.6600.0012; Sign Bridge S-40-122, Item 641.6600.0013; Sign Bridge S-40-132, Item 641.6600.0014; Sign Bridge S-40-135, Item 641.6600.0015; Sign Bridge S-40-136, Item 641.6600.0016; Sign Bridge S-40-443, Item 641.6600.0017; Sign Bridge S-40-444, Item 641.6600.0018; Overhead Sign Support S-40-991, Item 641.8100.0001; Overhead Sign Support S-40-992, Item 641.8100.0002; Overhead Sign Support S-40-993, Item 641.8100.0003; Overhead Sign Support S-40-989, Item 641.8100.0004; Overhead Sign Support S-40-147, Item 641.8100.0005; Overhead Sign Support S-40-148,

Item 641.8100.0006; Overhead Sign Support S-40-149, Item 641.8100.0007; Overhead Sign Support S-40-995, Item 641.8100.0008; Overhead Sign Support S-40-996, Item 641.8100.0009; Overhead Sign Support S-40-971, Item 641.8100.0010.

A Description

(1) This section describes providing steel sign bridges and steel overhead sign supports and supersedes standard spec 641 requirements for the specified bid items.

B Materials

B.1 High-Strength Bolt/Nut/Washer Assemblies

(1) Furnish zinc-coated bolt/nut/washer assemblies for field tensioning consisting of high-strength type 1 galvanized bolts conforming to ASTM A325, type 1 galvanized grade DH or DH3 nuts conforming to ASTM A563, and galvanized flat washers conforming to ASTM F436. Also conform to the following:

- Use the size, number, type, and configuration of hardened flat washers the DTI manufacturer recommends for bolt diameters greater than 1 1/8 inches.
- Ensure that the supplier pre-assembles each bolt/nut/washer assembly before shipping.
- Ensure that bolt/nut/washer assemblies are accompanied by a certified report of test or analysis giving the results of the supplier's rotational-capacity testing. No field rotational capacity testing is required.
- Ensure that bolt/nut/washer assemblies are shipped in sealed and labeled containers.
- Furnish 3 or more additional bolt/nut/washer assemblies of each rotational-capacity lot for pre-installation testing.
- Submit 2 or more additional bolts and 3 or more additional nuts and washers from each lot and heat for department mechanical testing. The contractor need not submit components from a lot and heat the department previously approved.

(2) Hot-dip zinc-coat according to ASTM A153 supplemented by ASTM F2329 or mechanically zinc-coat according to ASTM B695, class 50. Remove excess hot-dip zinc coating on threads by centrifuging or air blasting immediately after withdrawal. Do not flame-chase. Ensure that the same zinc-coating process is used for bolts and nuts within a bolt/nut/washer assembly.

(3) Ensure that the manufacturer provides identification marks for high-strength bolts and nuts according to ASTM A325.

B.1.1 High-Strength Bolts

(1) The required bolt length is the grip, total thickness of the connected material, plus the tabulated amount for each bolt size as follows:

BOLT SIZE	AMOUNT ADDED TO THE GRIP
5/8-inch	1 1/16 inches
3/4-inch	1 3/16 inches
7/8-inch	1 5/16 inches
1-inch	1 9/16 inches
1 1/8 to 1 1/4-inch	1 13/16 inches
1 3/8 to 1 1/2-inch	2 1/16 inches

(2) The above values are generalized, with allowance for manufacturing tolerances, to provide for a washer and using a heavy nut, with adequate stick-through at the end of the bolt. For each required beveled washer, add 5/16 inch; for any additional washer, add 3/16 inch; and for a load-indicating washer, add 1/8 inch. Adjust the length determined from the above table increment and allowances for additional washers to the next 1/4 inch length increment for bolts up to 5 inches length and to the next 1/2 inch length increment for lengths over 5 inches.

(3) The full thread may extend into the grip not more than 3/8 inch for lengths of 5 inches or less, and not more than 5/8 inch for lengths over 5 inches.

(4) Ensure that bolts conform to the following:

HARDNESS NUMBER		
BOLT SIZE	BRINELL min / max	ROCKWELL C min / max
1/2 through 1-inch	253 / 319	25 / 33
greater than 1-inch	223 / 286	19 / 30

B.1.2 High-Strength Nuts

(1) Ensure that the supplier lubricates zinc coated nuts with a lubricant containing dye that contrasts with the color of the zinc coating according to ASTM A563 supplementary requirements S1 and S2.

B.1.3 High-Strength Flat Washers

(1) Install bolts with a washer under the nut or bolt head, whichever is turned to tighten. If clearance is necessary, the contractor may clip washers on one side to a point not closer than 7/8 of the bolt diameter from center of washer.

B.1.4 Direct Tension Indicating Washers

(1) Furnish zinc-coated direct tension indicating (DTI) washers conforming to ASTM F959 type 325. Ensure that DTIs have identifying marks applied by the manufacturer. Provide the engineer with 2 copies of the DTI manufacturer's instructions showing acceptable installation configurations. Provide 3 or more additional DTI washers as required for pre-installation testing. Also provide the engineer with at least two 0.005-inch metal feeler gauges.

B.1.5 Testing and Reporting

(1) Ensure that supplier-performed rotational capacity testing conforms to Report No. FHWA SA-91-031 "High-Strength Bolts for Bridges". Furnish 2 copies of a certified report of test or analysis indicating the results of required manufacturer/supplier tests.

B.2 Anchor Bolts

(1) Furnish anchor bolts conforming to ASTM F1554, grade 55 and Supplementary Specification S4, ASTM A563A heavy hex nuts, and ASTM F436 washers all hot-dip

galvanized according to ASTM A153 supplemented by ASTM F2329. Over-tap galvanized nuts according to ASTM F2329.

(2) Use only nuts and anchor bolts manufactured with sufficient clearance to allow the nuts to run freely on the bolts after coating the threads and nuts with a wax-based lubricant.

B.3 Stainless Steel Bolts and Nuts

(1) Provide stainless steel set screws, bolts, nuts, and washers for hardware and U bolts as specified for bolts and nuts in standard spec 513.2.2.5.

B.4 Certification

(1) Submit a certified report of test or analysis to the engineer for columns, truss members, pipes, anchor bolts, high-strength bolts, nuts, and washers, and structural sections. The engineer must approve the material before the contractor may install in the work.

(2) The engineer may retest materials delivered to the job site; furnish the specimens for this testing at no expense to the department.

B.5 Steel Sign Bridges

(1) Furnish materials conforming to the following:

Structural Steel and Miscellaneous Metals 506.2

(2) If using steel pipe for chords and columns for sign bridges, conform to the American Petroleum Institute's Specification for Line Pipe API-5L and the grade the plans show. For all other pipe used for sign bridges, conform to ASTM A53, grade B of type E or S. If using structural steel for columns and in trusses for sign bridges, conform to ASTM A709 grade 36.

(3) Furnish sign bridge trusses, columns, and steel accessories zinc coated according to ASTM A123, the zinc coating must withstand 8 one-minute dips in the Preece test solution, ASTM A239.

B.6 Steel Overhead Sign Supports

(1) Provide commercially fabricated overhead sign supports conforming to AASHTO design and fabrication standards for structural supports for highway signs, luminaires, and traffic signals. Use a design life of 50 years with a wind importance factor of 1.00. Design to withstand a 3 second gust wind speed of 90 mph. Do not use the methods of appendix C of those AASHTO standards.

(2) Design structures, listed as applicable structure types in the AASHTO standards, to the fatigue category criteria as follows:

- Structures carrying variable message signs:
  - Category I criteria for structures over all roadway types.

- Structures carrying type II or III signs:
  - Category I criteria for structures used over highways and free flow ramps.
  - Category II criteria for structures with arms greater than 30 feet used over local roads and city streets.
  - Category III criteria for structures with arms 30 feet or less used over local roads and city streets.

(3) Use the posted speed limit of the roadway beneath the structure for truck-induced gusts.

(4) Submit shop drawings identified by structure number, design computations, and material specifications, to the engineer before erecting sign supports. Provide tightening procedures for mast arm or luminaire arm to pole shaft connections on the shop drawings. Have a professional engineer registered in the state of Wisconsin sign, seal, and date the shop drawings and certify that the design conforms to AASHTO standards and the contract.

(5) Provide steel pole shafts and mast arms zinc coated according to ASTM A123. Provide tapered pole and arm shafts with a minimum taper of 0.14 inch per foot for single-member vertical and single-member horizontal structure components.

C Construction

C.1 General

C.1.1 Methods

(1) Use construction methods for this work, including fabrication, inspection, erection, mill test reports, and shop drawings, conforming to standard spec 506.3. Construct concrete footings conforming to standard spec 636. Cure exposed portions of concrete footings as specified in standard spec 502.3.8.1. Wait until the concrete has attained 3500 psi compressive strength or 7 equivalent days as specified in standard spec 502.3.10 before erecting any portion of the structure on the footing.

C.1.2 High-Strength Bolts

C.1.2.1 Handling and Storage

(1) Store bolts/nut/washer assemblies and DTI washers in closed containers in a protected shelter to protect them from dirt and moisture until used. Maintain fastener system components as nearly as possible in the as-manufactured condition until installed. Remove from storage only as needed and promptly return unused components to storage.

C.1.2.2 Pre-installation Testing

(1) Notify the engineer before performing the required field pre-installation testing.

(2) Lubricate high-strength bolt threads with a wax-based lubricant before testing. Test bolt/nut/washer assemblies with DTI washers in all the configurations used for installation.

(3) Perform pre-installation testing in the field conforming to the procedures enumerated in department form DT2322 for bolt/nut/washer assemblies of each rotational-capacity lot with DTI washers in each installation configuration. Provide the engineer with the test results by submitting 2 copies of department form DT2322.

C.1.2.3 Bolt Installation

(1) Do not begin bolt installation without the engineer's approval.

(2) Lubricate high-strength bolt threads with a wax-based lubricant before installation.

(3) Tension high-strength bolts using direct tension indicating (DTI) washers. Install the DTI on the bolt with the protrusions facing away from the connected materials. Install bolt/nut/washer assemblies with DTI washers in the same configuration used for pre-installation testing.

(4) Tighten conforming to department form DT2322 to provide the correct installation tension. During the operation, ensure no rotation of the part not turned by the wrench. Snug systematically from the most rigid part of the connection to the free edges. Repeat until the full connection is in a snug condition and the faying surfaces are in firm contact. Systematically tighten the connection required number of refusals is achieved. If the gaps on the DTI washer are completely closed, discontinue tightening.

C.1.2.4 Contractor QC Testing

(1) In addition to contractor QC testing the engineer may verify bolt installation by periodically testing with a feeler gauge.

(2) Use a 0.005-inch metal feeler gauge to perform QC testing for each completed bolted connection in the presence of the engineer. Test a minimum of 10 percent of the bolts, but not less than 2 bolts, selected randomly in each connection. After observing at the initial QC testing frequency, the engineer may decide to observe QC testing at a reduced frequency.

(3) If the number of refusals required on department form DT2322 is achieved, the engineer will accept the connection as properly tightened. If for any bolt the required number of refusals is not achieved, tighten all bolts in the connection.

C.1.3 Anchor Assembly

(1) Install structures on anchor bolts conforming to the procedures enumerated in department form DT2321. Complete department form DT2321 for each structure. Indicate the parties responsible for the installation and submit the form to the engineer for inclusion in the permanent project record.

C.1.4 Sign Installation

(1) Install permanent signs as soon as support structures are erected. If permanent signing is not available, install sign-blanks to control vibration. Fasten to the supporting structure conforming to standard spec 637.3.3.3.

(2) For overhead sign supports, ensure that sign-blanks are the same sizes and at the same locations as the permanent signs.

(3) For sign bridges, attach sign-blanks to a minimum of 1/4 the truss length near its center. Use sign-blanks that are at a minimum 24 inches larger than the truss depth and project an equal distance beyond the top and bottom chord members.

(4) Install structure identification plaques on overhead sign supports and sign bridges in the locations the plan details show.

C.2 Steel Sign Bridges

(1) Perform all shop welding for steel sign bridges and supports as the plans show and conforming to AWS D 1.1, Structural Welding Code - Steel.

(2) Do not weld in the field without the engineer's written approval. The engineer will only allow field welding for repairs in noncritical locations and when a department-approved individual competent to perform inspections is present during the welding. Perform field welding using personnel qualified under AWS D 1.5, Bridge Welding Code.

(3) Inspect all welds visually, additionally, if the engineer determines, test all butt welds in main, stress-carrying members subject to tension or stress reversal by radiographic or ultrasonic methods over the entire length of the weld. Test other butt welds in these members by the same methods, except the engineer will determine the length of weld to test. Use either the dye penetrant method, or the magnetic particle method to test the fillet welds connecting columns to bases and main chord members, including the associated flanges, gussets, or main load carrying brackets or members, and on fillet welds connecting flanges to the main truss chord members. Perform the dye penetrant test according to according to ASTM E165, visual dye solvent removable. Perform the magnetic particle method according to the applicable requirements of ASTM E709. Furnish all materials, equipment, and personnel to perform this inspection at no expense to the department.

(4) Blast clean and then zinc coat the fabricated sign bridge trusses, columns, and their steel accessories after completing all cutting, punching, drilling, and welding.

(5) After zinc coating, assemble the individual members making up the truss sections, unless fabricated and zinc coated in one piece in the shop, adjust to the proper shape and alignment, and tighten the high-strength bolts to the required tension. Provide a certificate of compliance certifying that high-strength bolts within truss sections are tensioned conforming to standard spec 506.3.12. Then, assemble the truss sections that make up any one sign bridge in the shop, and adjust to proper alignment and camber as the plans show. Matchmark all truss sections and shims before disassembling for shipment.

(6) Assemble the sections making up the truss, together as a single unit, before attaching to the columns.

(7) Protect zinc coated members from damage to the zinc coating during transportation, storage, and erection. Paint areas of damaged zinc coating with 2 coats of zinc dust/zinc oxide paint. Clean damaged and adjacent areas by sanding, scraping, chipping, or wire brushing. Apply a profile to the bare metal surface using a needle gun before painting. For areas of damage larger than 10 square inches metalize according to AASHTO M36 or, for field repairs, using an engineer-approved high-temperature application of zinc powder and flux in paste or stick form.

C.3 Steel Overhead Sign Supports

(1) Under the Overhead Sign Support bid item, furnish and erect commercially designed sign supports, fabricated from steel, consisting of pole shafts, mast arms, anchor bolts, hardware, concrete supports and all other items necessary to complete the work.

(2) Construct the sign supports according to the manufacturer's instructions.

D Measurement

(1) The department will measure the Sign Bridge Single Pole Sign Support One Sign, Sign Bridge Single Pole Sign Support Two Signs, Sign Bridge Cantilevered, Sign Bridge Structure Mounted, and Sign Bridge bid items as a single lump sum unit for each sign bridge acceptably completed.

(2) The department will measure the Overhead Sign Support bid items as a single lump sum unit for each overhead sign support acceptably completed.

E Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
641.0100.0001	Sign Bridge Single Pole Sign Support One Sign S-40-788	LS
641.0100.0002	Sign Bridge Single Pole Sign Support One Sign S-40-789	LS
641.0600.0001	Sign Bridge Single Pole Sign Support Two Signs S-40-790	LS
641.1200.0001	Sign Bridge Cantilevered S-40-28	LS
641.1200.0002	Sign Bridge Cantilevered S-40-65	LS
641.1200.0003	Sign Bridge Cantilevered S-40-85	LS
641.1200.0004	Sign Bridge Cantilevered S-40-118	LS
641.1200.0005	Sign Bridge Cantilevered S-40-119	LS
641.1200.0006	Sign Bridge Cantilevered S-40-124	LS
641.1200.0007	Sign Bridge Cantilevered S-40-129	LS
641.1200.0008	Sign Bridge Cantilevered S-40-130	LS
641.1200.0009	Sign Bridge Cantilevered S-40-131	LS
641.1200.0010	Sign Bridge Cantilevered S-40-134	LS
641.1200.0011	Sign Bridge Cantilevered S-40-137	LS

ITEM NUMBER	DESCRIPTION	UNIT
641.1200.0012	Sign Bridge Cantilevered S-40-146	LS
641.1200.0013	Sign Bridge Cantilevered S-40-158	LS
641.6600.0001	Sign Bridge S-40-22	LS
641.6600.0002	Sign Bridge S-40-27	LS
641.6600.0003	Sign Bridge S-40-43	LS
641.6600.0004	Sign Bridge S-40-44	LS
641.6600.0005	Sign Bridge S-40-47	LS
641.6600.0006	Sign Bridge S-40-50	LS
641.6600.0007	Sign Bridge S-40-51	LS
641.6600.0008	Sign Bridge S-40-87	LS
641.6600.0009	Sign Bridge S-40-104	LS
641.6600.0010	Sign Bridge S-40-116	LS
641.6600.0011	Sign Bridge S-40-117	LS
641.6600.0012	Sign Bridge S-40-121	LS
641.6600.0013	Sign Bridge S-40-122	LS
641.6600.0014	Sign Bridge S-40-132	LS
641.6600.0015	Sign Bridge S-40-135	LS
641.6600.0016	Sign Bridge S-40-136	LS
641.6600.0017	Sign Bridge S-40-443	LS
641.6600.0018	Sign Bridge S-40-444	LS
641.8100.0001	Overhead Sign Support S-40-991	LS
641.8100.0002	Overhead Sign Support S-40-992	LS
641.8100.0003	Overhead Sign Support S-40-993	LS
641.8100.0004	Overhead Sign Support S-40-989	LS
641.8100.0005	Overhead Sign Support S-40-147	LS
641.8100.0006	Overhead Sign Support S-40-148	LS
641.8100.0007	Overhead Sign Support S-40-149	LS
641.8100.0008	Overhead Sign Support S-40-995	LS
641.8100.0009	Overhead Sign Support S-40-996	LS
641.8100.0010	Overhead Sign Support S-40-971	LS

(2) Payment for the Sign Bridge Single Pole Sign Support One Sign, Sign Bridge Single Pole Sign Support Two Signs, Sign Bridge Cantilevered, Sign Bridge Structure Mounted, and Sign Bridge bid items is full compensation for providing all materials; for anchor bolts; for high-strength bolt/nut/washer assemblies and DTI washers including those required for testing; for dampeners if required in the structure plans; for fabricating, including all cutting, preparing, welding, and zinc coating; for transporting and erecting; for structure identification plaques; and for sign blanks if required. Concrete footings are paid for separately as specified in standard spec 636.5. Signs and the sign mounting system are paid for separately as specified in standard spec 637.5.

(3) Payment for the Overhead Sign Support bid items is full compensation for designing the sign support structure; for excavating; for providing all materials, including anchor bolts, pole shafts, mast arms, required reinforcing steel, and concrete; for high-strength bolt/nut/washer assemblies and DTI washers including those required for testing; for fabricating, including all cutting, preparing, welding, and zinc coating; for placing and curing concrete footings; for transporting and erecting; for structure identification plaques; and for sign blanks if required. Sign lighting, when required, is paid for separately as specified in standard spec 659.5. Signs and the sign mounting system are paid for separately as specified in standard spec 637.5.

100. Sign Bridge Identification Plaques.

Supplement standard spec 641.5 with the following:

Payment for Sign Bridge and Overhead Sign Support is considered full compensation for providing and installing sign bridge identification plaques and mounting hardware as shown on the detail in the plans for each existing and new sign bridge or overhead sign support.
641-SER1 (20040910)

101. Field Facilities.

Replace standard spec 642 with the following:

The department has procured its own Field Facilities located at 2424 S. 102nd Street; West Allis, WI 53227.
SEF-ZOO IC 12_0723

102. Traffic Control.

The work under this item shall be in accordance to the requirements of standard spec 643, and as shown on the plans, or as approved by the engineer, except as hereinafter set forth.

Place traffic control devices for work in the proper location before operations proceed. Traffic Control is subject to change at the direction of the engineer in the event of an emergency.

Provide the Milwaukee County Sheriff's Department, City of Milwaukee Police Department, City of West Allis Police Department, City of Wauwatosa Police Department, Wisconsin State Patrol, the Statewide Traffic Operations Center, and the engineer a current telephone number with which the contractor or his representative can be contacted during non-working hours in the event a traffic control safety hazard develops.

Do not park or store equipment, vehicles, or construction materials within 30 feet of the edge of freeway traffic lanes without barrier separation for any roadway carrying freeway traffic; or within 20 feet off the edge of a freeway service interchange ramp during any

time except as approved by the engineer. At such locations, the materials and equipment involved shall not constitute a hazard to the traveling public.

Do not park personal vehicles within the access control limits of the freeway. Do not cross live freeway traffic lanes with equipment or vehicles.

Do not use flag persons to direct, control, or stop freeway traffic. Obtain approval from the engineer to use a flag person to direct, control, or stop local street traffic. Adhere to Manual of Uniform Traffic Control Devices chapter 6E standard requirements for flagger control.

Do not disturb, remove or obliterate any traffic control signs, advisory signs, shoulder delineators, sand barrel array or beam guard in place along the traveled roadways not shown on the plans without the approval of the engineer.

Place one flashing arrow board in advance of each lane closure taper and one flashing arrow board within each lane closure taper at locations directed by the engineer.
SEF Rev 13_0610

103. Nighttime Work Lighting-Stationary.

A Description
Provide portable lighting as necessary to complete nighttime work. Nighttime operations consist of work specifically scheduled to occur after sunset and before sunrise.

B (Vacant)

C Construction
C.1 General
This provision shall apply when providing, maintaining, moving, and removing portable light towers and equipment-mounted lighting fixtures for nighttime stationary work operations, for the duration of nighttime work on the contract.

At least 14 days prior to the nighttime work, furnish a lighting plan to the engineer for review and acceptance. Address the following in the plan:

1. Layout, including location of portable lighting – lateral placement, height, and spacing. Clearly show on the layout the location of all lights necessary for every aspect of work to be done at night.

2. Specifications, brochures, and technical data of all lighting equipment to be used.

3. The details on how the luminaires will be attached.

4. Electrical power source information.

5. Details on the louvers, shields, or methods to be employed to reduce glare.

6. Lighting calculations. Provide illumination with average to minimum uniformity ratio of 5:1 or less throughout the work area.

7. Detail information on any other auxiliary equipment.

C.2 Portable Lighting

Provide portable lighting that is sturdy and free standing and does not require any guy wires, braces, or any other attachments. Furnish portable lighting capable of being moved as necessary to keep up with the construction project. Position the portable lighting and trailers to minimize the risk of being impacted by traffic on the roadway or by construction traffic or equipment. Provide lightning protection for the portable lighting. Portable lighting shall withstand up to 60 mph wind velocity.

If portable generators are used as a power source, furnish adequate power to operate all required lighting equipment without any interruption during the nighttime work. Provide wiring that is weatherproof and installed according to local, state, federal (NECA and OSHA) requirements. Equip all power sources with a ground-fault circuit interrupter to prevent electrical shock.

C.3 Light Level and Uniformity

Position (spacing and mounting height) the luminaires to provide illumination with an average to minimum uniformity ratio of 5:1 or less throughout the work area.

Illuminate the area as necessary to incorporate construction vehicles, equipment, and personnel activities.

C.4 Glare Control

Design, install, and operate all lighting supplied under these specifications to minimize or avoid glare that interferes with all traffic on the roadway or that causes annoyance or discomfort for properties adjoining the roadway. Locate, aim, and adjust the luminaires to provide the adequate level of illumination and the specified uniformity in the work area without the creation of objectionable glare.

Provide louvers, shields, or visors, as needed, to reduce any objectionable levels of glare. As a minimum, ensure the following requirements are met to avoid objectionable glare on the roadways open to traffic in either direction or for adjoining properties:

1. Aim tower-mounted luminaires, either parallel or perpendicular to the roadway, so as to minimize light aimed toward approaching traffic.

2. Aim all luminaires such that the center of beam axis is no greater than 60 degrees above vertical (straight down).

If lighting does not meet above-mentioned criteria, adjust the lighting within 24 hours.

C.5 Continuous Operation
Provide and have available sufficient fuel, spare lamps, generators, and qualified personnel to ensure that the lights will operate continuously during nighttime operation. In the event of any failure of the lighting system, discontinue the operation until the adequate level of illumination is restored. Move and remove lighting as necessary.

D (Vacant)

E Payment
Costs for furnishing a lighting plan, and for providing, maintaining, moving, and removing portable lighting, tower mounted lighting, and equipment-mounted lighting required under this special provision are incidental to the contract.
643-010 (20100709)

104. Flexible Tubular Markers.

Replace standard spec 643.2.5.2 with the following:

Only flexible tubular markers with bases that bolt to the pavement surface shall be allowed for installations in which the flexible tubular markers will be in place during December, January, February and March. Flexible tubular markers that will be in place during these four months that attach to the pavement surface using any other means than a bolt connection will not be accepted. Provide a base designed to hold the post securely using locking pins, or other devices, to withstand a series of direct wheel impacts with speeds up to 65 mph.
SEF Rev. 12_0330

105. Traffic Control Signs Removal.

Supplement standard spec 643.3.8.3 with the following:

Remove all signs on temporary mounts and other potential associated hazards to the traveling public from the right-of-way when not in use.
SEF Rev. 14_0326

106. Traffic Control Detour Signs Not in Use.

Replace standard spec 643.3.8.6(6) with the following:

Immediately remove or cover signing when the detour is no longer in effect. When removing signs, remove all signs, posts, supports, and other potential associated hazards to the traveling public from within the right-of-way.
SEF Rev. 14_0402

107. Late Season Marking Requirements.

Replace standard spec 646.3.1.4(1) with the following:

Do not place wet reflective contrast tape marking after November 15 and before April 15 of the following calendar year unless both air and surface temperatures are 40 degrees F and rising. If those conditions are not met, apply epoxy marking material from the department's approved products list in the exact locations the plans show for wet reflective contrast tape. Maintain that marking until April 15. Then, unless the engineer allows otherwise, completely remove while installing wet reflective contrast tape.
SEF 14_0312

108. Pavement Marking Grooved Wet Reflective Contrast Tape 4-Inch, Item 646.0841.S; 8-Inch, Item 646.0843.S.

A Description

This special provision describes furnishing, grooving and installing preformed wet reflective pavement marking contrast tape for grooved applications as shown on the plans, according to standard spec 646, and as hereinafter provided.

B Materials

Furnish wet reflective pavement marking contrast tape and adhesive material, per manufacturer's recommendation if required, from the department's approved products list.

Furnish a copy of the manufacturer's recommendations to the engineer before preparing the pavement marking grooves.

C Construction

C.1 General

For quality assurance, provide the engineer and the region's Marking Section evidence of manufacturer training in the proper placement and installation of pavement marking contrast tape.

Plane the grooved lines according to details in the plan and per manufacturer's recommendations. Use grooving equipment with a free-floating, independent cutting head. Plane a minimum number of passes to create a grooved surface per manufacturer's recommendations.

C.2 Groove Depth

Cut the groove to a depth of 120 mils ± 10 mils from the pavement surface or, if tined, from the high point of the tined surface. To measure the depth, the contractor may use a depth plate placed in the groove and a straightedge placed across the plate and groove, or the contractor may use a straightedge placed perpendicular to the groove. The department may periodically check groove depths.

C.3 Groove Width – Longitudinal Markings
Cut the groove one-inch wider than the width of the tape.

C.4 Groove Position
Position the groove edge according to plan details. Groove a minimum of 4 inches, but not greater than, 12 inches from both ends of the tape segment. Achieve straight alignment with the grooving equipment.

C.5 Groove Cleaning
C.5.1 Concrete
Cooling the cutting head with water may be necessary for some applications and equipment. If cooling water is necessary, flush the groove immediately with high-pressure water after cutting to remove any build-up of cement dust and water slurry. If this is not done, the slurry may harden in the groove.

If water is used in the grooving process, allow the groove to dry a minimum of 24 hours after groove cleaning, and prior to pavement marking application. The groove surface shall be clean and dry before applying the adhesive, and the pavement marking tape. Use a high-pressure air blower with at least 185 ft^3/min air flow and 120 psi air pressure to clean the groove; use of the air blower does not decrease the amount of time required for the groove to dry.

C.5.2 New Asphalt
Groove pavement five or more days after paving.

Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove.

C.5.3 Existing Asphalt
Check for structural integrity in supporting grooving operations. If the structural integrity of the asphalt pavement is inadequate to support grooving operations, immediately notify the engineer.

Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove.

C.6 Tape Application
Apply the tape when both the air and surface temperature are 40 degrees F and rising.

Apply tape in the groove as per manufacturer's recommendations. If manufacturer's recommendations require surface preparation adhesive

1) For the Southeast Region and the ozone non-attainment Northeast Region counties of Sheboygan, Manitowoc, and Kewaunee:

   - Apply SPA-60 during May 1 to September 30, both dates inclusive due to Volatile Organic Compound Limitations..

   - Apply P-50 during October 1 to April 30, both dates inclusive. –

2) For the remainder counties:

   - Apply either adhesive.

Refer to the manufacturer's instructions for determining when the surface preparation adhesive is set.

Tamp the wet reflective pavement marking contrast tape with a tamper cart roller, with a minimum of a 200-lb load, cut to fit the groove. Tamp a minimum of three complete cycles (6 passes) with grooved modified tamper roller cart.

D Measurement
The department will not measure Pavement Marking Grooved Wet Reflective Contrast Tape (Width). The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
646.0841.S	Pavement Marking Grooved Wet Reflective Contrast Tape 4-Inch	LF
646.0843.S	Pavement Marking Grooved Wet Reflective Contrast Tape 8-Inch	LF

Payment is full compensation for cleaning and preparing the pavement surface; furnishing and installing the material; and for removing temporary pavement marking, if necessary.
646-022 (20120615)

109. Pavement Marking Grooved Wet Reflective Tape 8-Inch, Item 646.0883.S.

A Description
This special provision describes furnishing, grooving and installing preformed wet reflective pavement marking tape for grooved applications as shown on the plans, according to standard spec 646, and as hereinafter provided.

B Materials

Furnish grooved wet reflective pavement marking tape and adhesive material per manufacturer's recommendations, if required, from the department's approved products list.

Furnish a copy of the manufacturer's recommendations to the engineer before preparing the pavement marking grooves.

C Construction

C.1 General

For quality assurance, provide the engineer and the region's Marking Section evidence of manufacturer training in the proper placement and installation of pavement marking tape.

Plane the grooved lines according to details in the plan and per manufacturer's recommendations. Use grooving equipment with a free-floating, independent cutting head. Plane a minimum number of passes to create a grooved surface per manufacturer's recommendations.

C.2 Groove Depth

Cut the groove to a depth of 120 mils ± 10 mils from the pavement surface or, if tined, from the high point of the tined surface. To measure the depth, the contractor may use a depth plate placed in the groove and a straightedge placed across the plate and groove, or the contractor may use a straightedge placed perpendicular to the groove. The department may periodically check groove depths.

C.3 Groove Width – Longitudinal Markings

Cut the groove one-inch wider than the width of the tape.

C.4 Groove Position

Position the groove edge according to plan details. Groove a minimum of 4 inches, but not greater than, 12 inches from both ends of the tape segment. Achieve straight alignment with the grooving equipment.

C.5 Groove Cleaning

C.5.1 Concrete

Cooling the cutting head with water may be necessary for some applications and equipment. If cooling water is necessary, flush the groove immediately with high-pressure water after cutting to remove any build-up of cement dust and water slurry. If this is not done, the slurry may harden in the groove.

If water is used in the grooving process, allow the groove to dry a minimum of 24 hours after groove cleaning, and prior to pavement marking application. The groove surface shall be clean and dry before applying the adhesive, and pavement marking tape. Use a high-pressure air blower with at least 185 ft^3/min air flow and 120 psi air pressure to clean the groove; use of the air blower does not decrease the amount of time required for the groove to dry.

C.5.2 New Asphalt
Groove pavement five or more days after paving.

Use a high-pressure air blower with at least 185 ft^3/min air flow and 120 psi air pressure to clean the groove.

C.5.3 Existing Asphalt
Check for structural integrity in supporting grooving operations. If the structural integrity of the asphalt pavement is inadequate to support grooving operations, immediately notify the engineer.

Use a high-pressure air blower with at least 185 ft^3/min air flow and 120 psi air pressure to clean the groove.

C.6 Tape Application
Apply the wet reflective pavement marking tape when both the air and surface temperature are 40 degrees F and rising.

Apply tape in the groove as per manufacturer's recommendations. If manufacturer's recommendations require surface preparation adhesive

1) For the Southeast Region and the ozone non-attainment Northeast Region counties of Sheboygan, Manitowoc, and Kewaunee:

    - Apply SPA-60 during May 1 to September 30, both dates inclusive due to Volatile Organic Compound Limitations.

    - Apply P-50 during October 1 to April 30, both dates inclusive.

2) For the remainder counties:

    - Apply either adhesive.

Refer to the manufacturer's instructions for determining when the surface preparation adhesive is set.

Tamp the wet reflective pavement marking tape with a tamper cart roller, with a minimum of a 200-lb load, cut to fit the groove. Tamp a minimum of three complete cycles (6 passes) with grooved modified tamper roller cart.

D Measurement
The department will not measure Pavement Marking Grooved Wet Reflective Tape (Width). The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
646.0883.S	Pavement Marking Grooved Wet Reflective Tape 8-Inch	LF

Payment is full compensation for cleaning and preparing the pavement surface; furnishing and installing the material; and for removing temporary pavement marking, if necessary.
646-018 (20120615)

110. Temporary Pavement Markings.

Supplement standard spec 649.3.1 by adding the following:

Throughout this contract, have a long-line pavement marking truck available for use on the project site within 8 hours of the engineer's written order to perform temporary pavement marking work. Complete temporary pavement marking work within the timeframe designated in the engineer's written authorization. The cost of mobilizing the truck is incidental to the respective temporary pavement marking bid items.

111. Roadway Lighting Systems.

The following modifications are made to standard specifications and standard detail drawings:

Append standard spec 651.3.1 with the following:

Each electrical worker is responsible for his own protection from automatic switching and from switching by others. Conform to lock-out and tag-out rules that apply in the industry. Sign and date the tags and include the name of the contractor. If possible, clear lock-outs and tag-outs by the end of the work day. If not possible, notify the engineer.

The plans show required disconnections of existing lighting circuits, most in the form of abandoning existing underground conductors in place. The contractor may need to mobilize several times per each existing lighting distribution center. The contractor is expected to build these costs into the various paid items for removals and installations.

Append standard spec 651.5 with the following:

Work to disconnect and connect conductors will be incidental to the paid measurement of footage.

There will be no measurement for payment for abandoning conductors or removing conductors for scrap.

Work to disconnect and connect electrical system, splice through, or to connect conductors are incidental to the installation or removal of the lighting pay items included in this contract. The department will not measure conductors or conduits that have been abandoned in place or removing them for scrap. The department will allow, at the contractor's discretion, for the salvaging of conductors to be abandoned, if possible.

Append standard spec 652.3.1 with the following:

Installed minimum 3-inch diameter PVC conduit elbows in a ground mounted concrete bases to accommodate Cable in Duct (CID) type cable.

Append standard spec 652.3.1.2 with the following:

Furnish and install an UL-listed liquidtight flexible metallic conduit transition wherever a conduit exits from below grade.

Furnish a UL-listed fitting appropriate for the purpose at each transition from one type of conduit to another type. Couplings will not be individually measured for payment.

Append standard spec 652.3.1.4 with the following:

Support conductors at the top of the vertical raceway or as close as practical if the vertical rise exceeds 50-feet. Provide additional supports as shown; in no case shall the distance between supports exceed that shown in Table 300.19(A) of the National Electrical Code.

Append standard spec 655.3.1(1) and standard spec 655.3.7(3) with the following:

Wet location splices may be allowed under the following circumstances:

Where shown in the plans.

Where the best available location to connect new work to existing work below grade.

Make wet location splices with an approved epoxy kit.

Append standard spec 655.3.7(4) with the following:

Provide an approved secondary in line 600-volt AC fuse assembly with a FNQ 5 ampere fuses in the luminaire and provide No. 12 AWG, XLP wire in the pole shaft from fuses in the luminaire to underground feeder with splice at pole base. No. 12 AWG, XLP wire will be paid separately. Fuses are included in electrical wire bid items.

Where two or more cable networks occupy the same pull box, manhole, etc., bundle and tag each circuit network (i.e. A/B/N and C/D/N) with approved all-weather tags.

At each pull point or access point, indicate the line side bundle with a lap of blue tape. *Exception:* Where the direction the bundle comes from is obvious, the lap of blue tape is not required. *Example of exception:* a bridge parapet junction box.

Append standard spec 657.2.1(2) with the following:

For non-breakaway poles (mounted on structure, concrete base or behind noise wall barriers without transformer base), as well as at stems of sign bridges containing electrical wires, to be double nutted and contractor to install galvanized rat screen enclosing the bottom of pole area, extra nuts and screen incidental.

Modify standard spec 657.3.1(3) with the following:

Use corrosion protection measures for breakaway transformer bases and aluminum light poles for installation on lighting systems.

112. General Requirements for Electrical Work.

Append standard spec 651.3.3 (3) with the following:

Notify the department's Electrical Field Unit at (414) 266-1170 to coordinate the inspection. The department's Region Electrical personnel will perform the inspection for the state owned and maintained traffic signals.

113. Install Conduit Into Existing Item, Item 652.0700.S.

A Description
This special provision describes installing proposed conduit into an existing manhole, pull box, junction box, communication vault, or other structure.

B Materials
Use nonmetallic conduit, as provided and paid for under other items in this contract. Furnish backfill material, topsoil, fertilizer, seed, and mulch conforming to the requirements of pertinent provisions of the standard specifications.

C Construction
Expose the outside of the existing structure without disturbing existing conduits or cabling. Drill the appropriate sized hole for the entering conduit(s) at a location within the structure without disturbing the existing cabling and without hindering the installation of new cabling within the installed conduit. Fill void area between the drilled hole and conduit with an engineer-approved filling material to protect against conduit movement and entry of fill material into the structure. Tamp backfill into place.

D Measurement
The department will measure Install Conduit Into Existing System by the unit, acceptably installed. Up to five conduits entering a structure per entry point into the existing structure will be considered a single unit. Conduits in excess of five, or conduits entering at significantly different entry points into the existing pull box, manhole, or junction box will constitute multiple units of payment.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
652.0700.S	Install Conduit Into Existing Item	Each

Payment is full compensation for excavating, drilling holes; furnishing and installing all materials, including bricks, coarse aggregate, sand, bedding, and backfill; for excavating and backfilling; and for furnishing and placing topsoil, fertilizer, seed, and mulch in disturbed areas; for properly disposing of surplus materials; and for making inspections.
652-070 (20100709)

114. Electrical Conduit.

This special provision applies only to the City of Milwaukee owned traffic signals at the intersection of W. O'Connor Street and S. 70th Street.

Append standard spec 652.3.1.1 with the following:

Locations of the conduits are identified in the plans;however, installation will require integration with existing field conditions. Appropriate adjustment of conduit locations may be made if the field conditions are such that the pipes cannot be installed at the specified locations. Any relocation greater than five feet must be approved by the engineer.

Plan changes must be approved by the City of Milwaukee Electric Services Supervisor or Traffic Engineer. The primary contacts are Mr. Al Nichols, Traffic Operations Supervisor, (414) 286-368 office, (414) 708-5148 mobile; or Mr. Joseph Blakeman, Traffic Control Engineer III, (414) 286-8070.

Provide three sets of As-Built plan sets to City of Milwaukee Electric Services Supervisor or engineer upon completion of conduit installation.

115. Electrical Wiring.

Append standard spec 655.3.1 with the following:

(3) For all cables entering each pull box, except loop detector lead in cables, provide an extra loop, approximately 16 feet in length, to remain in each pull box. This loop of cable is in addition to the amount needed to reach from the entrance conduit raceway end to the opening in the exiting conduit raceway.

116. Electrical Service Meter Breaker Pedestal IH 94 Ramps and STH 181, Item 656.0200.3001; USH 45 Ramps and USH 18, Item 656.0200.3002.

Append standard spec 656.2.3 with the following:

State Owned Traffic Signals

The department will be responsible for the electric service installation request for any department maintained facility. Notify the maintaining authority if the signal is not state maintained that it is their responsibility to arrange for the electrical service installation.

Electric utility company service installation and energy cost will be billed to and paid for by the maintaining authority.

Append standard spec 656.3.4 with the following:

Install the cabinet base and meter breaker pedestal first, so the electric utility company can install the service lateral. Finish grade the service trench, replace topsoil that is lost or contaminated with other materials, fertilize, seed, and mulch all areas that are disturbed by the electric utility company.

Append standard spec 656.5(3) with the following:

Payment for grading the service trench, replacing topsoil, fertilizer, seed, and mulch will be incidental to this work unless the bid items are in the contract and then they will be paid for at the contract price.

117. Install Poles Type 9, Item 657.1345; Install Poles Type 10, Item 657.1350; Install Poles Type 12, Item 657.1355; Install Monotube Arms 15-FT, Item 657.1515; Install Monotube Arms 20-FT, Item 657.1520; Install Monotube Arms 30-FT, Item 657.1530; Install Monotube Arms 35-FT, Item 657.1535; Install Monotube Arms 40-FT, Item 657.1540; Install Monotube Arms 45-FT, Item 657.1545; Install Monotube Arms 50-FT, Item 657.1550; Install Monotube Arms 55-FT, Item 657.1555; Install Luminaire Arms Steel 8-FT, Item 657.1808.

A Description

(1) This special provision describes installing poles, monotube arms, and steel luminaire arms and supercedes standard spec 657 requirements for the specified bid items.

B Materials

B.1 Department-Furnished Materials

(1) The department will furnish the following:

- Type 9, 10, 12, and 13 poles and associated mounting hardware, hand hole covers, and pole caps.
- Monotube arms.
- Steel luminaire arms and associated connecting bolts. The department will provide tightening procedures for luminaire arm to pole shaft connections.

B.2 Contractor-Furnished Materials

B.2.1 High-Stength Bolt/Nut/Washer Assemblies

(1) Furnish zinc-coated bolt/nut/washer assemblies consisting of high-strength type 1 galvanized bolts conforming to ASTM A325, type 1 galvanized grade DH or DH3 nuts conforming to ASTM A563, and galvanized flat washers conforming to ASTM F436. Also conform to the following:

- Furnish 2 flat washers with each bolt/nut/washer assembly. Use the size, number, type, and configuration of hardened flat washers the DTI manufacturer recommends for bolt diameters greater than 1 1/8 inches.
- Ensure that the supplier pre-assembles each bolt/nut/washer assembly before shipping.
- Ensure that all bolt/nut/washer assemblies of a given size come from the same rotational-capacity lot, are shipped in sealed and labeled containers, and are accompanied by a certified report of test or analysis giving the results of the supplier's rotational-capacity testing. No field rotational capacity testing is required.
- Furnish 3 or more additional bolt/nut/washer assemblies of each size for pre-installation testing.
- Submit 2 or more additional bolts and 3 or more additional nuts and washers of each size for department mechanical testing. The contractor need not submit components from a lot and heat the department previously approved.

(2) Hot-dip zinc-coat according to ASTM A153 supplemented by ASTM F2329 or mechanically zinc-coat according to ASTM B695, class 50. Remove excess hot-dip zinc coating on threads by centrifuging or air blasting immediately after withdrawal. Do not flame-chase. Ensure that the same zinc-coating process is used for bolts and nuts within a bolt/nut/washer assembly.

(3) Ensure that the manufacturer provides identification marks for high-strength bolts and nuts according to ASTM A325.

(4) Ensure that supplier-performed rotational capacity testing conforms to Report No. FHWA SA-91-031 "High-Strength Bolts for Bridges". Furnish 2 copies of a certified report of test or analysis indicating the results of required manufacturer/supplier tests.

B.2.1.1 High-Stength Bolts

(1) Provide 1-inch diameter by 6-inch long bolts for type 9 and 10 poles. Provide 1 1/2-inch diameter by 7 1/2-inch long bolts for type 12 and 13 poles. The full thread may extend into the grip not more than 5/8 inch.

(2) Ensure that bolts conform to the following:

HARDNESS NUMBER		
BOLT SIZE	BRINELL min / max	ROCKWELL C min / max
1/2 through 1-inch	253 / 319	25 / 33
greater than 1-inch	223 / 286	19 / 30

B.2.1.2 High-Stength Nuts

(1) Ensure that the supplier lubricates zinc coated nuts with a lubricant containing dye that contrasts with the color of the zinc coating according to ASTM A563 supplementary requirements S1 and S2.

B.2.1.3 High-Stength Flat Washers

(1) If clearance is necessary, the contractor may clip washers on one side to a point not closer than 7/8 of the bolt diameter from center of washer.

B.2.2 Direct Tension Indicating Washers

(1) Furnish zinc-coated direct tension indicating (DTI) washers conforming to ASTM F959 type 325. Ensure that DTIs have identifying marks applied by the manufacturer. Provide the engineer with 2 copies of the DTI manufacturer's instructions showing acceptable installation configurations. Provide 3 or more additional DTI washers as required for pre-installation testing. Also provide the engineer with at least two 0.005-inch metal feeler gauges.

B.2.3 Testing and Reporting

(1) Ensure that supplier-performed rotational capacity testing conforms to Report No. FHWA SA-91-031 "High-Strength Bolts for Bridges". Furnish 2 copies of a certified report of test or analysis indicating the results of required manufacturer/supplier tests.

C Construction

C.1 General

(1) Install the department-furnished components indicated in the bid item names. Also provide high-strength bolts and DTI washers, fittings, either aluminum or galvanized steel shims, hardware, and other components the department does not furnish but that are required to complete the installation as the plans show.

(2) Install a grounding lug either inside the base or pole as required to connect equipment grounding conductors.

C.2 Poles

(1) Clean each pole before installation.

(2) Secure type 9, 10, 12, and 13 structures to anchor assemblies conforming to the procedures enumerated in department form DT2321. Complete department form DT2321 for each structure. Indicate the parties responsible for the installation and submit the form to the engineer for inclusion in the permanent project record.

(3) After completing erection using normal pole shaft raking techniques, ensure that the centerline of the shaft is vertical.

(4) Install identification plaques as the plans show.

C.3 Arms

C.3.1 General

(1) Install monotube and steel luminaire arms to supporting structures at the height and alignment the plans show.

C.3.1 High-Strength Bolts for Monotube Arms

C.3.1.1 Handling and Storage

(1) Store bolts/nut/washer assemblies and DTI washers in closed containers in a protected shelter to protect them from dirt and moisture until used. Maintain fastener system components as nearly as possible in the as-manufactured condition until installed. Remove from storage only as needed and promptly return unused components to storage.

C.3.1.2 Pre-installation Testing

(1) Notify the engineer before performing the required field pre-installation testing.

(2) Lubricate high-strength bolt threads with a wax-based lubricant before testing. Test bolt/nut/washer assemblies with the DTI washer between the bolt head and a flat washer with the DTI protrusions against the bolt head..

(3) Perform pre-installation testing in the field conforming to the procedures enumerated in department form DT2322 for each bolt/nut/washer/DTI size installed. Provide the engineer with the test results by submitting 2 copies of department form DT2322.

C.3.1.3 Bolt Installation

(1) Do not begin bolt installation without the engineer's approval.

(2) Lubricate high-strength bolt threads with a wax-based lubricant before installation.

(3) Tension high-strength bolts using direct tension indicating (DTI) washers. Install bolt/nut/washer assemblies with DTI washers in the same configuration used for pre-installation testing.

(4) Tighten conforming to department form DT2322 to provide the correct installation tension. During the operation, ensure no rotation of the part not turned by the wrench. Snug systematically from the most rigid part of the connection to the free edges. Repeat until the full connection is in a snug condition and the faying surfaces are in firm contact. Systematically tighten the connection required number of refusals is achieved. If the gaps on the DTI washer are completely closed, discontinue tightening.

C.3.1.3 Contractor QC Testing

(1) Notify the engineer before performing the required pre-installation testing. Do not begin bolt installation without the engineer's approval. The engineer may verify bolt installation by periodically testing with a feeler gauge.

(2) Use a 0.005-inch metal feeler gauge to perform QC testing for each completed bolted connection in the presence of the engineer. Test a minimum of 10 percent of the bolts, but not less than 2 bolts, selected randomly in each connection.

(3) If the number of refusals required on department form DT2322 is achieved, the engineer will accept the connection as properly tightened. If for any bolt the required number of refusals is not achieved, tighten all bolts in the connection.

D Measurement

(1) The department will measure the bid items under this standard spec as each individual unit acceptably completed.

E Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
657.1345	Install Poles Type 9	Each
657.1350	Install Poles Type 10	Each
657.1355	Install Poles Type 12	Each
657.1515	Install Monotube Arms 15-FT	Each
657.1520	Install Monotube Arms 20-FT	Each
657.1530	Install Monotube Arms 30-FT	Each
657.1535	Install Monotube Arms 35-FT	Each
657.1540	Install Monotube Arms 40-FT	Each
657.1545	Install Monotube Arms 45-FT	Each
657.1550	Install Monotube Arms 50-FT	Each
657.1555	Install Monotube Arms 55-FT	Each
657.1808	Install Luminaire Arms Steel 8-FT	Each

(2) Payment for the Install Poles bid items is full compensation for installing department-furnished poles and for providing grounding lugs, fittings, shims, hardware, and other required components the department does not furnish.

(3) Payment for the Install Monotube Arms and Install Luminaire Arms Steel bid items is full compensation for installing department-furnished arms; for providing high-strength bolt/nut/washer assemblies and DTI washers including those required for testing; and for providing related mounting hardware, leveling shims, and other required components the department does not furnish.

(4) The department will pay separately for concrete foundations under the Concrete Bases bid items and provide anchor assemblies for monotube bases under standard spec 654.

118. Anchor Assemblies Light Poles on Structures, Item 657.6005.S.

A Description

This special provision describes furnishing and installing anchor bolt assemblies for light poles as shown on the plans, and as hereinafter provided.

B Materials
Furnish anchors of the size and spacing as given on the plans, and that conform to ASTM A449 or AASHTO M314 GR 55. The upper 8 inches of the bolts, nuts, and washers shall be hot-dipped galvanized in accordance to ASTM A153, Class C. Provide enlarged threads on nuts for proper fit after galvanizing.

C Construction
Provide two nuts and two washers per anchor bolt, and install per light standard manufacturer's recommendations.

D Measurement
The department will measure Anchor Assemblies Light Poles on Structures as a unit for each individual anchor bolt assembly, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
657.6005.S	Anchor Assemblies Light Poles on Structures	Each

Payment is full compensation for furnishing and installing the anchorages.
657-060 (20100709)

119. Traffic Signals General.

State Owned Traffic Signals
Work under this item shall consist of furnishing and installing all materials, except for the traffic signal cabinet, video detection system, and emergency vehicle preemption system for the department owned traffic signals at the intersections of IH 94 eastbound Ramps and STH 181, IH 94 westbound Ramps and STH 181, USH 45 southbound Ramps and USH 18, USH 45 northbound Ramps and USH 18, and USH 18 and N. 95th Street in the Cities of West Allis and Milwaukee, WI. Install the traffic signal cabinet, video detection system, and emergency vehicle preemption system furnished by the department.

City of Milwaukee Owned Traffic Signals
The traffic signal at the intersections of W. Wisconsin Avenue and N. 97th Street and W. Wisconsin Avenue and N. 95th Street are owned and operated by the City of Milwaukee. Limited work is required for these traffic signals. The City of Milwaukee is responsible for the installation of all aboveground infrastructure and cabling at these intersections.

120. Pedestrian Signal Face 16-Inch.

Append standard spec 658.2.3.2(1) with the following:

Furnish 16 inch LED ready pedestrian signal housing, drilled for top/bottom pipe mount with the ability to rotate 270 degrees on poly mounting bracket.

Append standard spec 658.3.4 with the following:

Connect all ungrounded conductors with wire nuts in the appropriate sections of the signal heads. Connect the neutral conductors to the terminal strip. Be certain to twist wires prior to installing the wire nuts. All wire nuts must be installed facing up to prevent the entrance of water.

121. Pedestrian Push Buttons.

Append standard spec 658.2.5 with the following:

Furnish vandal resistant, pressure activated, pedestrian push buttons, with die cast body type, in unfinished aluminum or yellow. Button constructed shall be constructed of stainless steel, with a Piezo driven solid state switch, display and beeper that sounds simultaneously with button push.

Furnish low profile, unfinished cast aluminum, vandal resistant, and flush mounting pole mount.

Place a Size 1, Type H reflective (R10-3EL, R, D) sign sticker (per state sign plate), message series – B, directly above each push button. Include a directional arrow or arrows on the sign as the plans show.

122. Traffic Signal Faces.

Append standard spec 658.3.2 with the following:

Connect all ungrounded conductors with wire nuts in the appropriate sections of the signal heads. Connect the neutral conductors to the terminal strip. Be certain to twist wires prior to installing the wire nuts. All wire nuts must be installed facing up to prevent the entrance of water.

123. Temporary Traffic Signals for Intersections.

Append standard spec 661.2.1 with the following:

(1) Inspect the existing temporary traffic signal installation and inform the engineer of any defects or deficiencies. It shall be the 1060-33-78 contractor's responsibility to correct any defects or deficiencies prior to surrendering the temporary traffic signal to the contractor for project 1060-33-80. Assume ownership of all temporary traffic signal equipment as shown on the plan after all defects and deficiencies have been corrected. The signal controller shall be capable of operating with the video camera detection system and Emergency Vehicle Preemption (EVP) system. All wood poles shall be plumb and level. The department will be responsible for all temporary traffic signal timings. Provide the department a minimum five (5) working advance notice prior to needing all timings and/or timing changes. The department may request traffic signal timing changes to an approved

incident timing plan during the project. The department will implement any approved incident timing plan immediately upon notification of the change and immediately upon notification of switching the timing plan back to normal operation. The department will record the times of operation of the incident timing and subsequent return to normal operation.

(3) The temporary electrical service has been installed under project 1060-33-78. The department will pay for all installation and energy costs associated with the operation of the temporary traffic signal. Contact Justin Effinger at (262) 548-5676 with any temporary electrical service issues.

(5) Assume ownership of the video image detector system consisting of video image detector cameras, mounting brackets and hardware, power cable, video image processor card, and auxiliary equipment to make the video detector system fully operational.

Append standard spec 661.3.1 with the following:

(4) Assume ownership of the temporary video detection cameras at the locations shown on the plans and according to the manufacturer's recommendations at a minimum 30-foot mounting height. Assume ownership of the power cable and signal cabinet equipment. Aim the video cameras to provide detection at the location shown on the plans and make the video detector system fully operational.

(5) In the event, at installation or turn on date, a noticeable obstruction is present in line with the video detection zone(s), advise the engineer before setting the zone.

(6) The video camera shall be mounted on a wooden pole. Relocate the video camera to a suitable location if there is impedance on the sensor operation, construction related or otherwise.

(7) The video detection system, as shown in the traffic signal construction plans, shall be complete, in place, tested, and in full operation during each stage and sub-stage of construction.

Append standard spec 661.3.1.1 with the following:

(2) Place the pole in the ground to no less than 1/5 of the pole's length as the plans show. Sawcut existing pavement and concrete curb and gutter as needed to install the wood poles and guy wire anchors. Sawcut existing pavement in accordance to the pertinent provisions in standard spec 690.3, Construction. Remove pavement and concrete curb and gutter as shown on the plans and if needed to install the wood poles and guy wire anchors. Remove only as much pavement as needed to install the wood poles. Remove pavement and curb and gutter in accordance to the pertinent provisions in standard spec 204.3, Construction. Hold any wood poles in place and/or move wood poles during construction due to conflicts with proposed work.

Append standard spec 661.3.1.4 with the following:

(1) Obtain all span wire checks from the contractor for project 1060-33-78. Arrange for every other week inspections with the engineer to check the height of the span wire above the roadways to ensure that the bottom of the traffic signal heads remain within the minimum and maximum heights allowed above the roadway. Make all height adjustments within 1-hour of an inspection indicating that adjustments are required. Notify the engineer in writing upon completion of all necessary adjustments. Maintain a written log to properly document the date of each every other week inspection, the heights above the roadway, the roadway clearance after adjustments have been made and acceptance by the engineer. Provide all documentation related to the every other week span wire height checks as well as all records related to maintenance performed on the temporary traffic signal installations to the engineer upon project completion.

(4) Maintain all temporary vehicle detection zones as the plans show or as the engineer directs. The temporary vehicle detection zones shall be set near the vicinity and within the approximate distance from the stop bar as shown on the plans. Check temporary vehicle detection zones at a minimum every other week and at the opening of each stage of temporary traffic signal operation to ensure that they are working and are aimed properly. Check and/or adjust temporary vehicle detection zones immediately upon notification by the department and/or construction team that the video detection system is not operating correctly. Periodic adjustment of the detection zones and/or moving of the temporary vehicle detection sensors may be required due to changes in traffic control, staging, or other construction operations.

Ensure that the temporary vehicular detection system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

Append standard spec 661.3.2.6 with the following:

(6) Remove the video detection system from the temporary traffic signal poles and cabinet.

Append standard spec 661.5 with the following:

(2) Payment for the Temporary Traffic Signals for Intersections bid item is full compensation for assuming ownership, operating, maintaining, and repairing the complete temporary installation; and for removal. Payment also includes the following:

1. Furnishing and installing the replacement equipment.
2. The cost of delivery and pick-up of the cabinet assemblies.
3. Removal of service and site restoration.

Payment is full compensation for drilling holes; assuming ownership of all materials, including bricks, and coarse aggregate; for excavation, bedding, and backfilling, including any sand or other required materials; furnishing and placing topsoil, fertilizer, seed, and mulch in disturbed areas; for properly disposing of surplus materials; for making

inspections; for checking and/or adjusting the temporary detection zones on an every other week basis; for maintaining and changing the temporary detection zones to match the plans, traffic control, and construction staging; for relocating the temporary detection sensors due to construction activities, if required; for periodically cleaning all temporary vehicle detector equipment; for removing the temporary vehicle detector system; and for cleaning up and properly disposing of waste.

124. Ramp Closure Gates Hardwired 28-FT, Item 662.1028.S; Ramp Closure Gates Hardwired 37-FT, Item 662.1037.S; Ramp Closure Gates Hardwired 40-FT, Item 662.1040.S.

A Description

This special provision describes providing hardwired freeway on-ramp closure gates on type 5 steel luminaire poles.

B Materials

B.1 General

Provide five user manuals and a listing of vendors and contact information for each manufactured component including flasher electrical components.

The engineer may allow alternates equal to specified manufactured components. The engineer may require plan detail modifications to accommodate alternates. The engineer may accept alternate arms or mounting adaptors only if the contractor can demonstrate that the department can easily remove and replace the arms.

B.2 Components

Furnish type 5 steel poles designed to carry twin 15-foot luminaire arms and conforming to standard spec standard spec 657 and with dimensions for acceptable installation of the ramp gate hardware as shown on the detail. Ensure a contiguous pole by eliminating the hand hole near base of pole, thus allowing uninhibited mounting of the gate pivot assembly.

Furnish galvanized steel nuts and bolts conforming to ASTM A307 except where designated as high strength (HS), conform to ASTM A325. For the ramp closure gate locking mechanism, furnish a handle nut to fit on a 3/4-inch.

Furnish grade A36 steel for the gate supports, gate pivot assembly, and associated hardware galvanized after fabrication by either a mechanical or hot-dip process. Grind welded connections, rough edges, and burrs smooth before galvanizing to ensure a finished appearance. Ensure that the galvanized coating conforms to ASTM A 153.

Provide aluminum/fiberglass gate arms of the nominal length the bid item indicates and conforming to plan dimensions. Cover gate arms on two sides with alternating red and white shop-applied type H reflective from the department's approved products list. Also provide a shear pin base that is the manufacturer’s “permanent pivot” style. Obtain components from:

B&B Roadway
15191 Hwy 243
Russellville, AL 35654
Tel: (888) 560-2060

Gate arm: model MU605

Furnish a worm gear winch with a single line vertical lift capacity of 2000 lbs. Ensure that the winch has hardened steel gears, a handgrip, permanently lubricated bearings, a reinforced arc-welded reel assembly, and mounting plate. Ensure that the winch can be mounted to the winch mount plate shown on the construction details and the handgrip can be operated without conflict with the pole or ramp gate assembly. Furnish a 2-inch outdoor rated, rot resistant polyester strap for the connection between the worm gear winch and the gate arm pivot assembly.

Furnish hardwire power system and connections conforming to the following:

1. Cabinet

Furnish cabinet assemblies, power wire terminal strips, and power supplies for the on-ramp closure gate systems.

The cabinet shall be the following dimensions: 9-inches wide, 15-inches high, and 5-inches deep.

Minimum wall thickness of the aluminum castings shall be 3/16-inch.

Cabinet body shall have a cast rain hood over the top of the door opening.

Hinges shall consist of 3/6-inch diameter pins in cast hinge bosses that allow door to swing no less than 180º when open.

Cabinet shall be capable of being field prepared for top, bottom, or rear mounting and wire entrance holes.

Set screws shall be stainless steel.

Assembly shall be water resistant by the door flange in full contact with and compressing a neoprene gasket held by an adhesive to a groove cast into the cabinet body.

The cabinets shall consist of a cabinet body, door, and latch cast from aluminum alloy 319 or approved equivalent The door lock shall be a standard police lock reinforced with a steel plat which is keyed the same as the standard traffic control cabinets. The cast shall be free of voids, pits, dents, molding sand, and excessive foundry grinding marks. All radii shall be smooth and intact. Exterior and interior surfaces shall be smooth and cosmetically acceptable, free of molding fins, cracks, and other blemishes.

The aluminum shall meet the following minimum requirements:

- Yield Strength – 18 ksi
- Tensile Strength – 27 ksi
- Brinell Hardness – 70
- Elongation (% in 2 inches) – 2

The assembly shall have an alodine conversion coating to provide corrosion resistance and a proper base for paint adhesion.

Furnish a stainless steel or anodized steel mounting adapter plate to mount the cabinet to a pole with stainless steel banding straps.

2. Power Converter

Furnish the cabinet with a 120 VAC to 12 VDC power converter.

Furnish the cabinet with a 10 position terminal block for the 12 VDC power distribution. Power wire terminal strips 10 position feed-through terminal blocks UL recognized for No. 22 AWG wire through No. 16 AWG wire and UL rated for 15 amps. The terminals shall be tin-plated brass with brass clips and clamps.

Furnish gate flasher assemblies conforming to the following:

1. A 2-conductor connector, rated 12 volts at 5 amps minimum.

2. A 2-amp weather resistant in-line fuse and fuse holder.

3. Wiring harness made from 6-conductor 14 AWG stranded insulated control cable.

4. A 12 V flasher controller, capable of providing LED flashers with 5% to 100% duty cycle at a one-second pulse repetition rate.

5. A 4-conductor male/female electrical connector pair, 10 amp capacity for each connection, weather resistant, and mounted to allow rapid gate arm replacement.

6. A 5-amp mercury switch with less than 3 ohms “on” resistance and a 20 to 30 degree activation angle. Mount the switch on the gate arm to activate the flashers when the gate arm is lowered more than 45 degrees from vertical.

7. Furnish red LED flashers meeting the requirements of the MUTCD and/or AREMA standards for hue and brightness.

Power consumption	0.45 amp @ 10.5 V
Life expectancy	100,000 hrs
Directionality	0-degree cone orthogonal to face of flasher
Compliance temperature	-40° C to +70° C

Furnish electrical wires with jackets conforming to the following color scheme throughout the ramp closure gate system:

- Hot = Black or Red
- Neutral = White
- Ground = Green

Furnish a weatherproof hardened steel padlock with a minimum 2 1/4-inch shackle height and user programmable 4-digit combination.

C Construction

C.1 Ramp Closure Gates

Under the Ramp Closure Gates bid items, provide ramp closure gate at the locations the plans show. Apply marine grade anti seize compound compound to all bolt threads and to the interface between the aluminum base and steel pole. The engineer may direct adjustment of the gate arm assembly to ensure the correct vertical and angular orientation of the completed closure gate.

Install cabinet with power supply, flasher controller, and other components. Connect the 120 VAC to 12 VDC power supply to the circuit breaker in the breaker disconnect box. Connect the 120 VAC to 12 VDC power supply to the 10-position terminal block and connect the 12 VDC components to the terminal block.

Connect the 12 VDC terminal strip to the wiring harness through the female side of a 2-terminal polarized electrical connector. Connect male side of this connector to the flasher controller and the female side of a weatherproof polarized 4-conductor electrical connector.

Attach the male side of the 4 conductor electrical connector, mercury switch, wiring harness, and the three LED flasher units to the portion of the flasher assembly mounted on the breakaway portion of the gate arm. Adjust mercury switch so that as the gate arm is lowered to a maximum of 45 degrees from the vertical, the gate flasher assembly is energized, and the LEDs begin to flash. Ensure that when the gate arm is raised to a minimum of 15 degrees from vertical, the mercury switches the gate flasher assembly off.

Install structure identification plaques in the location the plan details show.

Contact Bill Wondrachek, (262) 548-5669, with questions regarding identification numbers

D Measurement

The department will measure the Ramp Closure Gates Hardwired bid items as each individual installation, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
662.1024.S	Ramp Closure Gates Hardwired 24-FT	Each
662.1037.S	Ramp Closure Gates Hardwired 37-FT	Each
662.1040.S	Ramp Closure Gates Hardwired 40-FT	Each

Payment for the Ramp Closure Gate Hardwired bid items is full compensation for providing ramp closure gates including support poles; for gate arm assemblies including guides, collars, and gate arms; for cabinets, locks, wiring, and power converters; for structure identification plaques; and for gate flashers.

662-005 (20130615)

125. Intelligent Transportation Systems (ITS) – Control of Materials.

Standard spec 106.2 – Supply Source and Quality

Supplement standard spec 106.2 with the following:

The department will furnish a portion of equipment to be installed by the contractor. This department-furnished equipment includes the following:

State-furnished Items
2070 Ramp Meter Controller
Dome Camera
50-Foot Camera Pole
Pole Mounted Camera
12-Count Fiber Optic Termination Panel
Ethernet Video Codec
Ethernet Switch
ITS Field Cabinet
Loop Amplifier Card
Microwave Detector Emulator Card

Pick-up small department-furnished equipment, such as communications devices, cameras, and controllers, from the department's Statewide Traffic Operations Center (STOC), 433 W. St. Paul Ave., Milwaukee, WI 53203 at a mutually agreed upon time during normal state office hours. Contact the department's STOC at (414) 227-2166 to coordinate pick-up of equipment.

Large department-furnished equipment, such as camera poles will be delivered by the supplier to a contractor-controlled site within Milwaukee County. Delivery will not necessarily be in a "just in time" manner. Store the equipment until field installation.

Provide location details and a contact for delivery coordination upon receiving the contract's Notice to Proceed.

Transportation of the equipment between the electric shop and the field or interim location(s) shall be the responsibility of the contractor.

Standard spec 106.3 – Approval of Materials
Supplement standard spec 106.3 with the following:

Design/Shop Drawings
Prior to the purchase and/or fabrication of any of the components listed herein, and for any non-catalog item shown on the Material and Equipment List specified above, and no more than 30 days after notice to proceed, submit five copies of design drawings and shop drawings, as required, to the department for review. The items and the drawings that represent them shall meet the requirements of the standard specifications.

Design drawing submissions shall consist of signed and certified designs, design drawings, calculations, and material specifications for required items.

Shop drawings will be required for, but not limited to the following:

- Mounting assemblies for the vehicle speed and classification sensors, including their attachment to the structure.
- Mounting LED warning signs to the sign structure.
- Mounting detail for dynamic message signs.
- Any contractor-designed structure or foundation.

The department will complete its review of the material within 30 days from the date of receipt of the submission, unless otherwise specified. The department will advise the contractor, in writing, as to the acceptability of the material submitted. The department may determine that if no exceptions were taken for the item, it is approved, and no further action is required by the contractor; or the item may be partially or totally rejected, in which case modify and/or amend the submittal as required by the department and resubmit the item within 14 days. At this time, the review and approval cycle described above will begin again.
670-005 (20100709)

126. Intelligent Transportation Systems – General Requirements.

A Description

A.1 General

This contract includes furnishing and installing elements for an Intelligent Transportation System (ITS) in or along the existing roadway as shown on the plans.

Unusual aspects of this project include:

1. The project includes working on cables and equipment that are carrying data between roadside equipment and the department's Statewide Traffic Operations Center (STOC). Interruption of this service is not expected to perform this work. If an interruption is determined necessary, it must be done on a weekend, and must be done in a way that minimizes communication outages for the existing equipment. Notify the department's STOC at least 48 hours in advance of the planned interruption.
2. The department will furnish some of the equipment to be installed. Make a reasonable effort to discover defects in that equipment prior to installing it.

A.2 Surge Protection

Equip every ungrounded conductor wire entering or leaving any equipment cabinet with a surge protector. For purposes of this section, multiple cabinets on a single pole or foundation are considered a single cabinet.

B Materials

B.1 General

Only furnish equipment and component parts for this work that are new and have high quality workmanship. All controls, indicators, and connectors shall be clearly and permanently labeled in a manner approved by the engineer. All equipment of each type shall be identical.

All electrical equipment shall conform to the standards and requirements of the Wisconsin Electrical Code, the National Electrical Manufacturers Association (NEMA), National Electric Safety Council (NESC), Underwriter's Laboratory Inc. (UL) or the Electronic Industries Association (EIA), when applicable. All materials and workmanship shall conform to the requirements of the National Electrical Code (NEC), Rural Electrification Administration (REA), Standards of the American Society for Testing and Materials (ASTM), American Association of State Highway and Transportation Officials (AASHTO), requirements of the plans these special provisions, the standard specifications, and to any other codes, standards, or ordinances that may apply. All system wiring, conduit, grounding hardware and circuit breakers shall be in conformance with the National Electrical Code. Whenever reference is made to any of the standards mentioned, the reference shall be considered to mean the code, ordinance, or standard that is in effect at the time of the bid advertisement.

B.2 Outdoor Equipment

All conductive connectors, pins (except pins connected by soldering), and socket contacts shall be gold plated. Acrylic conformal coating shall protect each circuit board side that has conductive traces. Except for integrated circuits containing custom firmware, all components shall be soldered to the printed circuit board.

To prevent galvanic corrosion, all connections between dissimilar metals shall incorporate a means of keeping moisture out of the connection. Where the connection need not conduct electricity, interpose a non-absorbing, inert material or washer between the

dissimilar metals. Use nonconductive liners and washers to insulate fasteners from dissimilar metals. Where the connection must conduct electricity, use a conductive sealant between the dissimilar metals. Alternatively, use an insulating gasket and a bond wire connecting the two metal parts.

B.3 Custom Equipment

Equipment that is not part of the manufacturer's standard product line, or that is made or modified specifically for this project, shall conform to the following requirements:

Where practical, electronics shall be modular plug-in assemblies to facilitate maintenance. Such assemblies shall be keyed to prevent incorrect insertion of modules into sockets.

All components shall be available from multiple manufacturers as part of the manufacturers' standard product lines. All must be clearly labeled with the value, part number, tolerance, or other information sufficient to enable a technician to order an exact replacement part.

Lamps used for indicator purposes shall be light-emitting diodes.

The printed circuit boards shall be composed of "two-ounce" copper on 1/16-inch thick fiberglass epoxy or equivalent type construction. Holes that carry electrical connections from one side of the boards to the other shall be completely plated through. Multilayer printed circuit boards shall not be used. The name or reference number used for the board in the drawings and maintenance manuals supplied to the department shall be permanently affixed to each board.

All components shall be mounted so that the identifying markings are visible without moving or removing any part, if practical.

B.3 Environmental Conditions

Equipment shall continue to operate as specified under the following ranges of environmental conditions, except as noted in the specifications for individual pieces of equipment.

1. **Vibration and Shock:** Vehicle speed and classification sensors and any other equipment mounted atop poles or on structures shall not be impaired by the continuous vibration caused by winds (up to 90 mph with a 30 percent gust factor) and traffic.
2. **Duty Cycle:** Continuous
3. **Electromagnetic Radiation:** The equipment shall not be impaired by ambient electrical or magnetic fields, such as those caused by power lines, transformers, and motors. The equipment shall not radiate signals that adversely affect other equipment.

4. **Electrical Power:**
    a. **Operating power:** The equipment shall operate on 120-volts, 60-Hz, single-phase unless otherwise specified. It shall conform to its specified performance requirements when the input voltage varies from 89 to 135 volts and the frequency varies +3 Hz.
    b. **High frequency interference:** The equipment operation shall be unaffected by power supply voltage spikes of up to 150 volts in amplitude and 10 microseconds duration.
    c. **Line voltage transients:** The equipment operation shall be unaffected by voltage transients of plus or minus 20 percent of nominal line voltage for a maximum duration of 50 milliseconds. Equipment in the field shall meet the power service transient requirements of NEMA Standard TS-2 when connected to the surge protectors in the cabinets.
5. **Temperature and Humidity:**
    a. **Field equipment:** Equipment in the field shall meet the temperature and humidity requirements of NEMA Standard TS-2. Liquid crystal displays shall be undamaged by temperatures as high as 165 degrees F, and shall produce a usable display at temperatures up to 120 degrees F.
    b. **Equipment in Controlled Environments** shall operate normally at any combination of temperatures between 50 degrees F and 100 degrees F, and humidity's between 5 percent and 90 percent, non-condensing, and with a temperature gradient of 9 degrees F per hour.

B.4 Patch Cables and Wiring

All cables and wiring between devices installed in a single cabinet, or in separate cabinets sharing a single concrete base, will be considered incidental to the installation of the devices and no separate payment will be made for them. It is anticipated that this will include fiber optic patch cables between termination panels and Ethernet switches, 10 / 100 MBPS Ethernet cables, RS-232 cables between individual devices and terminal servers, and power cables between individual devices and power sources within the cabinets.

B.5 Surge Protection

Low-voltage signal pairs, including twisted pair communication cable(s) entering each cabinet shall be protected by two-stage, plug-in surge protectors and shall be installed on both ends of camera control cables. The protectors shall meet or exceed the following minimum requirements:

1. The protectors shall suppress a peak surge current of up to 10k amps.
2. The protectors shall have a response time less than one nanosecond.
3. The protector shall clamp the voltage between the two wires at a voltage that is no more than twice the peak signal voltage, and clamp the voltage between each wire and ground at 50 volts.
4. The first stage of protection shall be a three-element gas discharge tube, and the second stage shall consist of silicon clamping devices.
5. The protector shall also contain a resettable fuse (PTC) to protect against excessive current.

6. There shall be no more than two pairs per protector.
7. It shall be possible to replace the protector without using tools.

Cables carrying power to curve signs shall be protected at the cabinet by grounded metal oxide varistors of appropriate voltages. The varistors must be at least 0.8 inch in diameter.

C Construction

C.1 Thread Protection

Provide rust, corrosion, and anti-seize protection at all thread assemblies of metallic parts by coating (non-spray) the mating surfaces with an approved compound. Failure to use an approved compound will result in no payment for the items to which coating was to have been applied.

C.2 Cable Installation

When installing new cables into conduits containing existing cables, remove the existing cables and reinstall the existing cables simultaneously with the new cables. Take every precaution necessary to protect the existing cables. In the event of avoidable damage to the existing cables, replace all damaged cables, in-kind, at no additional expense to the department. When cables are pulled into conduit, use a cable pulling lubricant approved by the cable manufacturer. Submit documentation supporting manufacturer approval of the lubricant to the engineer.

C.3 Wiring

Every conductor, except a conductor contained entirely within a single piece of equipment, must terminate either in a connector or on a terminal block. Provide and install the connectors and terminal blocks where needed, without separate payment. Use approved splice kits instead of connectors and terminal blocks for underground power cable splices.

Permanently label and key connectors to preclude improper connection. Obtain prior engineer approval for the labeling method(s) prior to use.

Terminal blocks must be affixed to panels that permanently identify the block and what wire connects to each terminal. This may be accomplished by silk screening or by installing a laminated printed card under the terminal block, with the labels on portions of the card that extend beyond the block. Installation of terminal blocks by drilling holes in the exterior wall of the cabinet is not acceptable.

Use barriers to protect personnel from accidental contact with all dangerous voltages.

Do not install conductors carrying AC power in the same wiring harness as conductors carrying control or communication signals.

Arrange wiring, including fiber optic pigtails, so that any removable assembly can be removed without disturbing wiring that is not associated with the assembly being removed.

Communication and control cables may not be spliced underground, except where indicated on the plans.

Cables in the Statewide Traffic Operations Center or in communication hubs, which are not contained within a single cabinet, shall have at least 10 feet of slack.

C.4 System Operations
If the contractor's operations unexpectedly interrupt Intelligent Transportation Systems (ITS) service, notify the engineer immediately and restore service within 24 hours. Repair all damaged facilities to the condition existing before the interruption. If service is not restored within 24 hours, the department may restore service to any operating device and deduct restoration costs from payments due the contractor.

C.5 Surge Protection
Arrange the equipment and cabinet wiring to minimize the distance between each conductor's point of entry and its protector. Locate the protector as far as possible from electronic equipment. Ensure that all wiring between the surge protectors and the point of entry is free from sharp bends.

D Measurement
No separate measurement will be made for the work described in this article.

E Payment
No separate payment will be made for the work described in this article. All work described in this article shall be included under the ITS items in the contract.
670-010 (20100709)

127. Intelligent Transportation System – Communication Vault.

673.2 Materials

3) Furnish a vault lid with a minimum design load of 15,000 pounds and that has permanent stamp that reads WISDOT COMMUNICATIONS or as the plans show. The vault lid will have 2 slots measuring ½ inch by 4 inches to use as a pull out. The vault lid will also be detectable through the inclusion of detectable metal incorporated into the lid.

128. Install ITS Field Cabinet, Item 673.0200.S.

A Description
This special provision describes installing a state-furnished type 170, size 334 field cabinet.

B Materials
The department will furnish the type 170, size 334 field cabinet. Provide all necessary miscellaneous mounting hardware and internal power cables. With the field cabinet, the department will furnish cabinet bolts to anchor the cabinet to the concrete base.

C Construction
Install the field cabinet on a new or existing concrete base paid separately. Make all power connections to the cabinet, isolating the neutral bus from the cabinet and equipment ground.

Effectively ground all cable grounding shields and any spare or unused conductors in the field cabinet to the equipment grounding terminal strip.

D Measurement
The department will measure Install ITS Field Cabinet by the unit, installed according to the contract and accepted.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
673.0200.S	Install ITS Field Cabinet	Each

Payment is full compensation for installing the state-furnished field cabinet; making all connections; and grounding as necessary.
673-005 (20100630)

129. Install Pole Mounted Cabinet, 673.0225.S.

A Description
This special provision describes installing department furnished aluminum enclosures on poles for intelligent transportation systems equipment.

B Materials
Use stainless steel bolts, nuts, and washers unless otherwise specified.

All conductors, terminals, and parts that could be hazardous to maintenance personnel shall be protected with suitable insulating material.

The cabinet will be equipped with service panels. Two panels shall be provided and mounted on the cabinet sidewalls. The left side panel shall be designated as "Input/Communications," and the right side panel shall be designated as the "Service Panel."

The service panel will be equipped with a four-outlet handi-box. Wire the handi-box to the series portion of the filtering surge protector.

Use metallic conduit, fitting, and adapters required from the underground conduit transition point to the cabinet as part of this item. A typical installation requires on 2-inch conduit. Use metallic conduits according to standard spec 652.

C Construction
Fasten the field cabinet securely onto a pole. Provide bolted stainless steel connections with lock washers, locking nuts, or other engineer-approved means to prevent the connection nuts from backing off. Isolate dissimilar materials from one another using stainless steel fittings. Make all power connections to the cabinet as specified in standard spec 656.

Drill and tap the cabinet, as necessary, to mount the terminal blocks and other attachments to the services panel, to provided and entrance on the back of the cabinet for cable from the pole mounted intelligent transportation system equipment, and to mount the service panel to the cabinet as shown in the detail. Remove all sharp edges or burrs, or both, caused by cutting or drilling process. Seal all opening to prevent water from entering the cabinet. Mount the surge protector to the service panel.

Install metallic conduit on the exterior of the pole (for entrance to the cabinet from the ground) as shown in the plans, and according to the applicable requirements of standard spec 652.

D Measurement
The department will measure Install Pole Mounted Cabinet as each individual assembly, acceptably completed

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
673.0225.S	Install Pole Mounted Cabinet	Each

Payment is full compensation for installing the pole mounted cabinet; for making all connections conduit/wire entrances; and for furnishing all testing.
673-010 (20100630)

130. Install Ethernet Switch, Item 675.0400.S.

A Description
This special provision describes installing an Ethernet switch, and providing all necessary associated wiring.

B Materials
The department will furnish the Ethernet switch. Provide all necessary cables between the Ethernet switch and terminal server or other device.

C Construction
Install the Ethernet switch in a new or existing field cabinet. Connect it to devices as shown on the plans, or as directed by the engineer.

D Measurement
The department will measure Install Switch by the unit, installed in accordance to the contract, tested and accepted.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
675.0400.S	Install Ethernet Switch	Each

Payment is full compensation for installation of the Ethernet switch; furnishing all necessary incidental hardware; and making all necessary connections.
675-040 (20100630)

131. Intelligent Transportation Systems – Signal Assemblies.

Replace standard spec 676.2.4(1) with the following:

676.2.4 Signal Heads

1) Furnish the housing, visor, lenses, LED modules, and other components consisting of an LED signal head assembly from the statewide approved electrical materials list.

132. Removing Advance Flasher Assemblies Type 1, Item 676.9001.S.

A Description
Remove advance flasher assemblies at the locations shown on the plan. Rewire and disconnect all wiring in the control cabinet as necessary and properly dispose of materials, according to the pertinent provisions of standard spec 204 and as hereinafter provided.

B Materials
Dispose of all materials resulting from removing the Advance Flasher Assemblies including but not limited to poles, break-a-way bases, signal assemblies, bulbs, and wire off the job site.

C Construction
Do not remove existing advance flasher assemblies until proper disconnects and wiring changes in the controller cabinet have been made.

Where an existing advance flasher assembly is mounted to a light pole, remove all signal hardware including wire, conduit, signal assemblies and mounts. Where existing conduit has been installed under concrete sidewalk or roadway, do not remove buried conduit unless directed otherwise by the engineer or unless it is not possible to install new wire through the existing conduit.

D Measurement
The department will measure Removing Advance Flasher Assemblies (Type) by the unit, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
676.9001.S	Removing Advance Flasher Assemblies, Type 1	Each

Payment is full compensation for removing advanced flasher assemblies; for rewiring, as necessary; for disconnecting wiring as necessary in the controller cabinet; and for properly disposing of all materials.

Removal of concrete bases and signs associated with this item will be measured and paid for separately.
676-900 (20100630)

133. Install Video Encoder, Item 677.0300.S.

A Description
This special provision describes installing a state-furnished video encoder in a pole mounted cabinet or field cabinet as shown on the plans and as hereinafter provided.

B Materials
Provide Category 5 or better Ethernet cable to connect the Ethernet video encoder to the Ethernet switch. The department will furnish the video encoder or it will be an existing and salvaged encoder.

C Construction
Make the necessary electrical and communication network connections to the video encoder. Mount the video encoder in the cabinet or field cabinet. Program the video encoder according to the manufacturer's instructions.

D Measurement
The department will measure Install Video Encoder by each individual assembly, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
677.0300.S	Install Video Encoder	Each

Payment is full compensation for installing the video encoder in a pole mounted cabinet or field cabinet; for making all connections; and for furnishing all programming.
677-030 (20100630)

134. Removing 50-Foot Camera Pole, Item 677.9051.S.

A Description
This special provision describes removing an existing camera pole.

B (Vacant)

C Construction
Disconnect all cables, wiring and equipment that are mounted on or in the poles, and remove the pole from the concrete footing. The department will pick up any antennae, cameras, or other equipment mounted on the pole; contact maintenance staff at (414) 227-2166 at the department's Statewide Traffic Operations Center, when the material is ready to be picked up. Properly dispose of the pole, conduit, cabling, and wiring away from the project site.

D Measurement
The department will measure Removing 50-Foot Camera Pole by the unit, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
677.9051.S	Removing 50-Foot Camera Pole	Each

Payment is full compensation for removing and disposing of the existing camera pole; disconnecting any necessary wiring; removing the equipment mounted on the poles; disposing of cabling and wiring; and transportation.
677-901 (20100630)

135. Removing CCTV Camera, Item 677.9200.S.

A Description
This special provision describes removing an existing CCTV camera from an existing camera pole as described in the plan.

B (Vacant)

C Construction
Disconnect all wiring at the control cabinet and at the top of the camera pole. Remove all fastening hardware and remove the existing camera and pan, tilt, and zoom mechanisms from the top of the pole. Salvage and store the cameras for pick up by the department; contact maintenance staff at (414) 227-2166 at the department's Statewide Traffic Operations Center to coordinate when the materials will be picked up.

The contractor may request a meeting with the engineer to assess the condition and operability of the camera prior to beginning work on removing the camera. Any damage or improper operation not noted at the meeting, or prior to the contractor starting work on the removal, will be assumed to be the fault of the contractor; repair or replace the camera at no additional cost to the department. Store the camera until the department picks up the camera.

D Measurement
The department will measure Removing CCTV Camera by the unit, acceptably and completely removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
677.9200.S	Removing CCTV Camera	Each

Payment is full compensation for removing an existing CCTV camera; for disconnecting all necessary cables and wiring; and properly storing the materials.
677-902 (20100630)

136. Install Overhead Freeway DMS Full Matrix, Item 678.0100.S.

A Description
This special provision describes installing a state-furnished, or an existing salvaged, dynamic message sign on a new sign structure.

B Materials
The department will provide the sign, or it will be salvaged, controller, and the control cable. The control cable will be multi-mode fiber optic cable.

Use an AWG #6 copper wire or equivalent bonding straps to bond the sign and cabinet to the structure. Use an AWG #6 solid, bare copper wire to bond the sign structure to the ground rod(s).

1. For the three wires carrying 120/240 VAC power from the cabinet to the sign, use single conductor, stranded copper, 120/240 VAC, XLP insulated, USE rated wire. Size the wire to carry the maximum amperage permitted by the main breakers in the sign.

Provide a 100-amp 120/240-VAC load center in the controller cabinet, along with breakers recommended by the sign manufacturer.

C Construction
Install the load center so that the main breakers control all power to the sign and cabinet. Provide at least three branch circuits, one for the sign, one for the controller and communication equipment, and one for all cabinet accessories, such as fan, light, and

heater. Only protect the branch serving the controller and communication equipment with the second stage of the surge protector. Connect the power and control cables according to the manufacturer's recommendations. Run the cables in rigid metallic conduit or flexible metallic conduit, or combination of these, within the sign structure.

Bond the bottom of the sign structure to one or more ground rods. Use exothermic welding at each end of the ground wire, unless the steel structure has a suitable grounding lug. Use a device that measures resistance to ground using the three-point fall-of-potential method to ensure that the resistance from the sign's ground bar to ground does not exceed 4 ohms. Add more ground rods if necessary to achieve this requirement.

D Measurement

The department will measure Install Overhead Freeway DMS Full Matrix by each sign, acceptably installed and tested.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
678.0100.S	Install Overhead Freeway DMS Full Matrix	Each

Payment is full compensation for installing and testing the sign and controller; providing cables, conduits, and fittings; for testing the sign; and for transporting materials.

678-010 (20100630)

137. QMP Concrete Pavement Special Requirements.

This is a specialized QMP Concrete Pavement specification modified for Zoo Interchange projects.

Supplement standard specs 701, 710, and 715 with the following:

A Description

A.1 General

Conform to standard spec 320, 415, 416, and 501 as modified in this special provision. Apply this special provision only to the following bid items:

320.0100 - 0199 Concrete Base (inch)
320.0300 - 0399 Concrete Base HES (inch)
415.0060 - 0199 Concrete Pavement (inch)
415.1080 - 1199 Concrete Pavement HES (inch)
415.0410 Concrete Pavement Approach Slab
415.1410 Concrete Pavement Approach Slab HES
415.0310 Concrete Alley
415.1310 Concrete Alley HES
415.0210 Concrete Pavement Gaps
Concrete Pavement (inch) Special

A.2 Quality Control Program

A.2.1 Control Charts

Maintain control charts when required by the test reporting procedures. Ensure that all tests are recorded and become part of the project records. Plot required test results on the control charts. Include random, non-random, and engineer requested testing, but only include the contractor's randomly selected QC test results in the 4-point running average. Other process control or informational tests on the control charts may be plotted, but do not include them in 4-point running averages.

Post control charts in an engineer-approved location, and update daily. Ensure that the control charts include the project number, the test number, each test element, the applicable warning and control limits, the contractor's individual test results, the running average of the last 4 data points, and the engineer's verification and independent assurance test data points. Use the control charts as part of a process control system for identifying potential problems and assignable causes. Format control charts according to CMM 8.30.

A.2.2 Department Testing

A.2.2.1 Verification Testing

Supplement standard spec 701.4.2 with the following:

The department will perform verification testing as follows:

	Testing Frequency Guide[1]	Sampling Material and Location	Test Method	Alternate Test Methods
Air content	1 per lot	Plastic concrete, ahead or behind[2] the paver	AASHTO T 152 as modified	Hardened air content testing[2] after construction
28-day compressive strength	1 per lot	Cylinders	AASHTO T 22, T 23 and T 141 as modified	Random cores[2] after construction

[1] The engineer may increase the frequency at start-up or as necessary to validate the quality of the materials.

[2] Evaluation of test results shall account for systematic differences in testing methods or sampling locations.

Plot verification tests on the contractor's quality control charts as specified in B.4.1. Do not include verification tests in the 4-point running average.

A.2.2.1.1 Independent Assurance Testing

Supplement standard spec 701.4.3 with the following:

Plot the independent assurance tests on the contractor's quality control charts as specified in A.2.1. Do not include independent assurance tests in the 4-point running average.

A.2.3 Contractor Testing for Small Quantities
Supplement standard spec 701.2.2(3) with the following:

1. No concrete control charts are required. Submit test results to the engineer each day as they become available. Assure that all properties are within the limits specified in the standard specifications for each sublot tested.

B Materials
B.1 Class I Concrete Mixes
B.1.1 General
Supplement standard spec 501 with the following:

Use clean, hard, durable crushed limestone with 100% fractured surfaces and free of an excess of thin or elongated pieces, frozen lumps, vegetation, deleterious substances or adherent coatings considered injurious.

Use virgin aggregates only.

B.1.2 Aggregates
B.1.2.1 Fine Aggregates
Delete standard spec 501.2.5.3.4.

B.1.2.2 Course Aggregates
B.1.2.2.1 Deleterious Substances
Replace standard spec 501.2.5.4.2(1) with the following:

The amount of deleterious substances shall not exceed the following percentages:

DELETERIOUS SUBSTANCE	PERCENT BY WEIGHT
Shale	1.0
Coal	1.0
Clay lumps	0.3
Soft fragments	3.0
Any combination of above	3.0
Thin or elongated pieces based on a 3:1 ratio	15.0
Materials passing the No. 200 (75 µm) sieve	1.5
Chert[1]	3.0

[1] Material classified lithologically as chert and having a bulk specific gravity (saturated surface-dry basis) of less than 2.45. Determine the percentage of chert by dividing the weight of chert in the sample retained on a 3/8-inch (9.5 mm) sieve by the weight of the total sample.

B.1.2.3 Combined Aggregate Gradation
Replace standard spec 715.2.2(1) items 2 and 3 with the following:

2. The percent passing the 1 inch (25 mm) sieve is less than or equal to 95.
3. The percent passing the No. 4 (4.75 mm) sieve is less than or equal to 47.

C Construction
C.1 Sampling and Testing
C.1.1 Aggregate Testing
C.1.1.1 General
Supplement standard spec 710.5.6.1 with the following:

Ensure that only results of randomly selected QC tests are included in the 4-point running average.

Use control limits for sieve sizes as identified in the project concrete mix report or, if the concrete mix report is not published at the time of testing, in the contractor's quality control plan. Gradation warning limits are inside the upper and lower control limit values by one percentage point for all sieves except as follows:

1. The upper warning limits for percent passing the No. 100 (150 μm) and No. 200 (75 μm) sieves are inside the control limit by 0.5 percent.
2. For sieves allowing 100 percent passing, there is no upper warning limit. For sieves with 0 percent passing, there is no lower warning limit.

C.2 Testing and Acceptance
C.2.1 Class I Concrete Testing
C.2.1.1 Lots by Lane-Feet
Supplement standard spec 715.3.1.2.2 with the following:

Lots and sublots may include concrete from more than one day of paving.

A sublot is 350 linear feet for 3-lane paving width or 2-lane plus shoulder.

Sublots at either end of a paving pass may be greater than 1000 lane-feet in size to accommodate the actual project length and staging requirements. For ease of layout, begin the first sublot at the first even station of the project. Place the resulting partial quantity into the first full sublot.

Document the locations and quantities of integral shoulders, and identify the travel lane sublot tests used for acceptance. For a shoulder pavement placed in a separate paving pass, designate separate lots and sublots.

C.3 Strength Evaluation
C.3.1 Pavement
Replace standard spec 715.3.2.2.1 with the following:

If a sublot strength is less than 3000 psi (17.2 MPa), the department may direct that sublot to be cored to determine its structural adequacy and whether to direct removal. Cut and test cores according to AASHTO T 24 as and where the engineer directs. Have an HTCP certified PCC technician I perform or observe the coring. Bear all coring and testing costs, fill all core holes with an approved grout, and provide traffic control during coring at no cost to the department.

The sublot pavement is conforming if the compressive strengths of all cores from the sublot are 3000 psi (17.2 MPa) or greater or the engineer does not require coring.

The sublot pavement is nonconforming if the compressive strengths of any core from the sublot is less than 3000 psi (17.2 MPa). The department may direct removal and replacement or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

C.3.2 Acceptance
The department will accept concrete pavement based on the contractor QC tests unless it is shown through the verification or the dispute resolution process that the contractor's tests are in error.

D (Vacant)

E Payment
E.1 General
Replace standard spec 715.5.1(4) with the following:

The department will adjust pay for each lot using percent within limits (PWL) of the 28-day sublot average strengths for that lot. The department will measure PWL relative to the lower specification limit of 4500 psi.

E.2 Pavements
Replace standard specs 715.5.2(1) through 715.5.2(3) with the following:

(1)The department will adjust pay for each lot using equation "QMP 3.03" as follows:

Percent Within Limits	**Pay Adjustment*[1]***
(PWL)	(dollars per square yard)
≥ 85 to 100	0
≥ 30 to < 85	(1.5/55 x PWL) – (127.5/55)
< 30	-1.50

(2) The department will not pay incentive if the lot standard deviation is greater than 400 psi.

(3) For lots with less than 4 sublots, the department will assess a disincentive based on the individual sublot average strengths. The department will reduce pay for sublots with an average strength below 4500 psi by $1.50 per square yard.
SEF Rev.14_0312

138. Permanent Steel Bridge Deck Forms.

A Description

Work under this item applies to the optional use of permanent steel bridge deck forms to construct cast-in-place bridge decks on steel box girders. The permanent steel bridge deck forms may only be used in the interior bay of steel box girders as shown on the plans.

Conventional forming shall be used for deck areas indicated herein for which the use of permanent steel bridge deck forms is not allowed. If conventional forming is used over the steel box girders, all forming materials must be removed.

B Materials

Permanent steel bridge deck forms and supports shall be fabricated from steel conforming to ASTM A 653 having a galvanized coating designation of G235 according to ASTM A 653 any grade except Grade 50, Class 3.

Attachment form hardware to be galvanized shall conform to ASTM A 123. All damaged steel form panel galvanizing shall be cleaned and recoated prior to placement of deck concrete.

C Construction

C.1 General

The contractor may, at their option, use permanent steel bridge deck forms in lieu of conventional forms as the bottom forms for the cast-in-place concrete bridge decks supported on steel box girders. The use of the permanent steel bridge deck forms is subject to the limitations in this special provision and as indicated on the plans.

Transverse steel deck form panel construction joints shall be located at the bottom of a flute. Field drill ¼-inch diameter weep holes at 12-inch maximum spacing along the joint.

C.2 Submittals

Provide plans for each structure where the permanent steel bridges deck forms are to be used, signed and sealed by a registered professional engineer licensed in the State of Wisconsin. Submit three copies of the plans for review before ordering material and starting construction. The drawings shall show the grade of steel, the physical and section properties for all deck members, the method of support and grade adjustment, deflections, accommodation for skew and methods of end sealing against concrete or grout leaks, and the method for handling, storage and erection of the permanent steel bridge deck panels. Review and acceptance of the installation plan by the department does not relieve the

contractor of responsibility for properly designing and constructing the bridge decks with the use of permanent steel bridge deck forms.

C.3 Limitations

The use of permanent steel bridge deck forms for bridge deck construction is not permitted as follows:

a. For bridges with steel I girder and prestressed girder superstructures.
b. The bay between the steel box girders and the deck cantilever in multi steel box girder superstructures. The deck cantilever is the deck area that extends beyond any exterior flange and web of a steel box girder and is only supported on one side by the exterior flange and web.

C.4 Design

(1) Physical design properties shall be computed in conformance with the requirements of the latest edition of the AISI specification for the "Design of Cold Formed Steel Structural Members."

(2) Design the forms on the basis of deadload of form, reinforcement, and plastic concrete plus 20 lb/ft^2 for construction loads.

(3) Do not allow deflection under the weight of the forms, reinforcement and plastic concrete to exceed 1/180 of the form span, or ½-inch, whichever is less, for form spans of 10 feet or less.

(4) Use a design span of the form equal to the clear span of the form plus 2 inches.

(5) The clearance between the surface of permanent forms and any bar reinforcement shall be not less than 1 ½-inch.

(6) Do not consider the permanent steel bridge deck form as lateral bracing for compression flanges of supporting structural members.

(7) Secure forms to the supporting members by means other than welding directly to the member. Welding to the girder flanges will not be allowed.

D Measurement

If used, permanent steel deck forms will not be measured separately for payment and will be considered included in the work for other items in the contract.

E Payment

Payment to the contractor utilizing this option is based on the contract unit bid price and plan quantity for the item HPC Masonry Structures in the contract documents and shall include all work required in this special provision.

139. Precast Prestressed Concrete Deck Panels B-40-537 and B-40-538.

A Description

This special provision describes the allowed optional use of stay-in-place precast prestressed concrete deck panels to construct bridges B-40-537 and B-40-538. Precast prestressed concrete deck panels may be used in the construction of the concrete decks for B-40-537 and B-40-538, at the option of the contractor, in lieu of using conventional deck formwork. If used, design, manufacture, transport and erect precast prestressed concrete deck panels in accordance to the Wisconsin Department of Transportation Bridge Manual, the pertinent sections of the standard specifications, and as hereinafter provided.

B Materials

B.1 Concrete

Use concrete in the precast panels that meets the following requirements: Grade D concrete; minimum compressive strength of 5000 psi at 28 days; and minimum release strength of 4000 psi.

B.2 Reinforcing

Use pretensioned reinforcement that conforms to the requirements of standard spec 503.2.3.

Use high strength bar steel reinforcement that conforms to the requirements of standard specification 505.2.3.

Use deformed welded wire reinforcement that meets the requirements of ASTM A1064.

B.3 Polystyrene and Fiberboard

Use rigid cellular polystyrene or fiberboard to form the haunches at the girder top flanges. Use rigid cellular polystyrene that meets the requirements of ASTM C578, Classification Type IV (4) and has a minimum density of 1.6 pcf, and minimum compressive strength of 25 psi; or use asphalt-impregnated fiberboard that meets the requirements of AASHTO M213, or asphalt-impregnated fiberboard sheathing that meets the requirements of ASTM C208.

B.4 Grout

If grout is used to support the deck panels, use an approved non-shrink, non-chloride grout mixed and placed in accordance to the grout manufacturer’s instructions and specifications.

B.5 Plant Certification

Furnish precast prestressed concrete deck panels that have been manufactured in a plant meeting the requirements of standard spec 503.2.4.

C Construction

C.1 Design

Provide precast prestressed panels with minimum thickness per 17.10 of the Wisconsin Department of Transportation Bridge Manual. Position and space pretensioned reinforcement, deformed welded wire reinforcement and high strength bar steel reinforcement per 17.10 of the Wisconsin Department of Transportation Bridge Manual.

C.2 Surface Finish

Score the top surfaces of deck panels with a tining rake or similar tool, parallel to the panel's prestressing strands. Score the top surfaces at ¾-inch to 1-inch spacing, and to a depth of 1/8-inch to 3/16-inch. Remove areas of mortar buildup in excess of 3/8 inches above the top surface of the panel.

C.3 Tolerances

The maximum allowable dimensional tolerances for the deck panels shall be as follows:

Thickness	+3-16-inch or -0"
Length	+¼-inch
Width	+¼-inch
Squareness (difference in diagonal lengths)	½-inch
Location of Strands (measured from bottom of plank to centerline strand)	(panel thickness)/2 ± 1/8-inch
Bowing	±1/8-inch
Sweep	±1/8-inch
Warping	1/16 inch per foot of distance from nearest adjacent corner

C.4 Handling and Storing

Handle the precast prestressed concrete deck panels, from the time of releasing the strands until they are in place in the structure, in accordance to standard spec 503 and as hereinafter specified.

The department will reject panels having cracks visibly apparent radiating from the strand at the end of the panel.

Maintain the panels in a flat position at all times and support the panels at approximately 15 inches from ends. Place the supports at right angles to the strands and ensure that the supports extend the full width of the panel.

During storage and transportation, position the supports such that the panels are maintained in a level position and are not twisted. When panels are stacked, position the supports of all panels in the same vertical planes and ensure that the supports are of adequate thickness to prevent damage to the lifting hooks.

C.5 Deck
Place the precast prestressed deck panels on rigid cellular polystyrene or fiberboard. Cut and place the polystyrene or fiberboard to form a haunch that produces a uniform total deck thickness. If grout is used to support the panels, place the grout before the cast-in-place deck. A flowable grout may be used after the panels have been set, or a low slump grout may be used and placed immediately before the panels are set. Place the grout a minimum of three days before placement of the cast-in-place deck and use wetted burlap to cure the exposed grout.

Prior to placement of concrete over the panels, clean the tops of the panels and ensure that they are free of all foreign material. Immediately prior to placing concrete over the panels, wet the top surface of the panels until free moisture appears and remains.

Place cast-in-place concrete and reinforcement bars in accordance to standard specs 501 and 505. Take special care to properly vibrate the concrete at the panel ends over the girders to avoid honeycombs and voids.

D Measurement
If used, precast prestressed concrete deck panels will not be measured separately for payment and will be considered included in the work for other items in the contract.

E Payment
Payment to the contractor utilizing this option is based on the contract unit bid prices and respective plan quantities for the items Concrete Masonry Bridges and Bar Steel Reinforcement HS Bridges for B-40-537 and B-40-538 and includes all the work and requirements hereinbefore described in this special provision.

140. EBS Excavation, Item SPV.0035.0100.

A Description
This special provision describes excavating and disposing of material taken below the subgrade of future pavement structures at locations determined by the engineer.

B Materials
Excavate all materials below subgrade not classified as rock, stone piles and stone fences, or marsh excavation. Perform work in accordance to standard spec 205.2.2 and as hereinafter provided.

C Construction
Perform work in accordance to the pertinent provisions of standard spec 205.3 and as hereinafter provided.

C.1 Yielding Subgrade
After rough grading on all or a portion of the subgrade in cut areas and in areas requiring 2 feet or less embankment is complete and the grade is ready for blue tops, point out areas of yielding subgrade to the engineer. The engineer will evaluate the subgrade to determine if EBS Excavation is required.

If the engineer requests, provide loaded trucks and run the subgrade as the engineer directs to confirm yielding areas. Perform EBS Excavation in yielding areas as directed by the engineer.

C.2 Excavation Below Subgrade
Excavate materials as directed by the engineer. Remove deposits of frost-heave material, unstable silty soils, wet and unstable soil, material salvaged from old road cores in marshes, topsoil containing considerable amounts of humus or vegetable matter, rocks, or other undesirable foundation material to the depth below finished grade as the engineer directs.

Compact, or prepare otherwise as required, the existing ground within the roadway foundation as necessary to support the roadway and attain the specified density.

Dispose of all excavated materials offsite at no expense to the department. Locate disposal sites outside the right-of-way and comply with all regulations relating to disposal of solid waste. Ensure that disposal sites are neatly constructed. In performing these operations, do not create a nuisance or cause pollution or siltation of natural watercourses, streams, lakes, wetlands, or reservoirs. Obtain written permits for disposal from the owner of the property where placing the material, unless disposing of the material at a licensed waste disposal operation. Furnish permits, or copies of permits, to the engineer before disposal. Do not deposit waste in wetlands.

C.3 Temporary Drainage
During construction, slope and drain the excavation bottoms to prevent water accumulation. If it is necessary in the prosecution of the work to interrupt existing surface drainage, sewers, or under drainage, provide temporary drainage until completing permanent drainage work.

D Measurement
The department will measure EBS Excavation by the cubic yard acceptably completed as computed using the method of average end areas, with no correction for curvature.

The department will not measure for payment materials excavated in forming benches or steps in preparing the foundation for embankments placed on slopes.

The department will not measure for payment materials excavated to remove frost from newly constructed embankments or cut subgrades.

If undercutting designated slopes to provide for placing topsoil or salvaged topsoil, the undercut is incidental to the Topsoil or Salvaged Topsoil bid items.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.0100	EBS Excavation	CY

Payment for EBS Excavation is full compensation for performing excavation below subgrade after receiving engineer approval; for the satisfactory disposal of all resulting material offsite; for obtaining and furnishing copies of permits; for furnishing, placing, and removing all temporary drainage installations; and for providing loaded trucks and running them on the subgrade to confirm yielding areas.

The department will only pay for engineer-approved EBS Excavation to correct problems beyond the contractor's control. Work performed under standard spec 105.3 to correct unacceptable work is the contractor's responsibility.

141. EBS Backfill, Item SPV.0035.0101.

A Description

This special provision describes backfilling EBS Excavation with select crushed material.

B Materials

Furnish all materials in accordance to standard spec 312.2 and as hereinafter provided.

C Construction

Place select crushed material where EBS Excavation was performed or as the engineer directs. Compact select crushed material using standard compaction conforming to standard spec 301.3.

D Measurement

The department will determine weight or volume, adjust for moisture, and convert between weight and volume as specified in standard spec 301.4.

The department will measure EBS Backfill by the cubic yard, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.0101	EBS Backfill	CY

Payment for EBS Backfill is full compensation for providing and compacting select crushed material in areas of EBS Excavation.

The department will only pay for EBS Backfill at engineer-approved EBS Excavation locations. Work performed under standard spec 105.3 to correct unacceptable work is the contractor's responsibility.

The department will not pay for EBS Backfill to replace materials excavated to remove frost from newly constructed embankments or cut subgrades.

142. Excavation, Hauling, and Reuse of Solid Waste Soil, Item SPV.0035.0700.

A General

A.1 Description

This special provision describes excavating, relocating, and reusing solid waste soil on-site at the project.

Perform this work in accordance to the requirements of standard spec 205 and with pertinent parts of Chapters NR 700-754 of the Wisconsin Administrative Code, as supplemented herein. Per NR 718.07, a solid waste collection and transportation service-operating license is required under NR 502.06 for each vehicle used to transport impacted soil.

A.2 Notice to the Contractor – Impacted Soil Locations

The department completed testing for soil contamination at locations within this project where excavation is required. Testing indicated that historic fill (containing foundry wastes, metals, and/or petroleum compounds, defined as "solid waste soil") is present in soil at the following locations as shown on the plans:

Ramp GD Station 775GD+75 to 779GD+76, from 50 feet left to 40 feet right of Ramp ES reference line (southeast quadrant of S. 100th St. and W. Schlinger Ave.) from 0 to 7 feet bgs. Soil contains <25% foundry wastes. Approximately 1,592 cubic yards (approximately 2,706 tons at an estimated 1.7 tons per cubic yard) of soil to be excavated from this area will be reused on the project as specified in Section A.3.

I-94 East-West Station 182EW+50 to 186EW+00 from 75 feet left to 100 feet right of reference line. Ramp EWD from approximately 16EWD+00 to 19EWD+00 from 100 feet left to 100 feet right of Ramp SW reference line. NR 538 characterized foundry waste was placed at this location during emergency bridge replacement in 2010. Approximately 14,982 cubic yards (approximately 25,469 tons at an estimated 1.7 tons per cubic yard) of soil and foundry waste to be excavated from this area will be reused on the project as specified in Section A.3.

If other signs of contamination are encountered at these locations or elsewhere on the project, terminate excavation activities in the area and notify the engineer.

A.3 Reuse of Solid Waste Soils

Low-level impacted soil excavated from the locations listed in A.2 is characterized as Solid Waste Soil and shall be reused as fill at the following locations:

Ramp BA from Station 725BA+50 to Station 728BA+50, East side, from approximately 100 feet north of Bluemound Road to 430 feet north of Bluemound Road.

Reuse soil deposited at this location shall be capped with 1 to 2 feet of clay (or equivalent fine-grained soil with a hydraulic conductivity equal to or less than 10^{-6} cm/sec and with an organic content of <15%). The clay shall be covered with topsoil and then seeded.

Soils that are reused as project fill should not contain crushed asphalt or other non-exempt solid wastes.

A.4 Excavation Management Plan Approval

The excavation management plan for this project has been designed to minimize the off-site disposal of impacted material. The excavation management plan, including these special provisions, has been developed in cooperation with the WDNR. The WDNR concurrence letter is on file at the Wisconsin Department of Transportation. For further information regarding previous investigation and remediation activities in these areas contact:

Name:	Michael Cape, P.G.
Address:	141 NW Barstow Street, Waukesha, WI 53187-0798
Phone:	(262) 548-5930
Fax:	(262) 548-6891
E-mail:	michael.cape@dot.state.wi.us

A.5 Coordination

Coordinate work under this contract with the WisDOT BTS environmental consultant. Determine the environmental consultant by contacting the following at least 30 days prior to the pre-construction conference:

Name:	Bryan Bergmann, P.G. or Tyler Stapel, P.E.
Address:	150 N. Patrick Blvd. Ste. 180, Brookfield, WI 53045
Phone:	(262) 879-1212
Fax:	(262) 879-1220
E-mail:	bbergmann@trcsolutions.com ; wstapel@trcsolutions.com

The role of the environmental consultant will be limited to:

Determining the location and limits of solid waste soil to be excavated and reused as fill based on soil analytical results from previous investigations, visual observations, and field screening of soil that is excavated;

Documenting that activities associated with management of solid waste soil are in conformance with the solid waste management methods for this project as specified herein; and,

Obtaining the necessary approvals for the reuse of solid waste soils from the WDNR.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all excavation activities in the areas specified above to the environmental consultant. Also notify the environmental consultant at least 3 calendar days prior to commencement of excavation activities in each solid waste soil area.

Coordinate with the environmental consultant to ensure that the environmental consultant is present during excavation activities in the solid waste soil areas. Perform excavation work in each of these areas on a continuous basis until excavation work is completed.

The environmental consultant will be responsible for obtaining the necessary approvals for on-site reuse of the excavated solid waste from the WDNR. Do not transport soil offsite without prior approval from the environmental consultant.

B (Vacant)

C Construction

Supplement standard spec 205.3 with the following:

Control operations in the impacted areas to minimize the quantity of solid waste soil excavated and hauled for reuse within the project right-of-way.

The environmental consultant will periodically evaluate soil excavated from the area specified above. The environmental consultant will evaluate excavated soil based on field screening results, visual observations, and soil analytical results from previous environmental investigations. Assist the environmental consultant in collecting soil samples for evaluation using excavation equipment. The sampling frequency shall be a maximum of one sample for every 20 cubic yards excavated.

Directly load and haul soils designated by the environmental consultant for reuse. Use loading and hauling practices that are appropriate to prevent any spills or releases of soil during transit. Prior to transport, sufficiently dewater soils designated for on-site reuse so as not to contain free liquids.

D Measurement

The department will measure Excavation, Hauling, and Reuse of Solid Waste Soil in cubic yards of solid waste soil reused as documented by the engineer.

E Payment

The department will pay for measured quantities specified herein at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.0700	Excavation, Hauling, and Reuse of Solid Waste Soil	CY

Payment is full compensation for excavating, segregating, loading, hauling, and placing of solid waste soil; obtaining solid waste collection and transportation service operating licenses; assisting in the collection of soil samples for field evaluation; and for dewatering of soils prior to transport, if necessary.

143. HPC Masonry Structures, Item SPV.0035.4000.

This special provision describes specialized material and construction requirements for high-performance concrete used in bridge structures. Conform to standard specs 501, 502 and 509, as modified in this special provision. This special provision also describes QMP concrete pavement and structures. Conform to standard spec 715 as modified in this special provision.

MODIFY THE STANDARD SPECIFICATIONS AS FOLLOWS:

501.2.5.4.1 General
Replace the entire text with the following:

(1) Use clean, hard, durable crushed limestone with 100% fractured surfaces and free of an excess of thin or elongated pieces, frozen lumps, vegetation, deleterious substances or adherent coatings considered injurious.

(2) Use virgin aggregates only.

501.2.5.4.2 Deleterious Substances
Replace paragraph one with the following:

(1) The amount of deleterious substances must not exceed the following percentages:

DELETERIOUS SUBSTANCE	PERCENT BY WEIGHT
Shale	1.0
Coal	1.0
Clay lumps	0.3
Soft fragments	5.0
Any combination of above	5.0
Thin or elongated pieces based on a 3:1 ratio	15.0
Materials passing the No. 200 sieve	1.5
Chert[1]	1.0

[1]Material classified lithologically as chert and having a bulk specific gravity (saturated surface-dry basis) of less than 2.45. Determine the percentage of chert by dividing the weight of chert in the sample retained on a 3/8-inch sieve by the weight of the total sample.

501.2.5.4.3 Physical Properties
Replace paragraph one with the following:

(1) The department will ensure that Los Angeles wear testing conforms to AASHTO T 96, soundness testing conforms to AASHTO T 104 using 5 cycles in sodium sulfate solution on aggregate retained on the No. 4 sieve, and freeze-thaw soundness testing conforms to AASHTO T 103. The percent wear must not exceed 30, the weighted soundness loss must not exceed 6 percent, and the weighted freeze-thaw average loss must not exceed 15 percent.

501.3.2.4.3.3 Extended Delivery Time
Delete paragraph one.

501.3.5.1 General
Replace paragraph one with the following:

(1) Use central-mixed concrete as defined in 501.3.5.1(2) for all work under this special provision.

501.3.5.2 Delivery
Replace paragraph three with the following:

(3) Deliver and completely discharge concrete within one hour beginning when adding water to the cement, or when adding cement to the aggregates. A decrease in concrete temperature below 60° F or the use of department-approved retarders does not increase the discharge time.

501.3.7.1 Slump
Replace the entire text with the following:

(1) Use a 2-inch to 4-inch slump.

(2) Perform the slump tests for concrete according to AASHTO T 119.

501.3.8.2.1 General
Replace paragraphs one and two with the following:

(1) Take the following steps to ensure the quality of the concrete placed. Submit a written temperature control plan at or before the pre-pour meeting. In that plan, outline the actions the contractor will take to control concrete temperature if the concrete temperature at the point of placement exceeds 80° F. Do not place concrete without the engineer's written acceptance of that temperature control plan. Perform the work as outlined in the temperature control plan.

(2) If the concrete temperature at the point of placement exceeds 80° F, do not place concrete for items covered in this special provision.

501.3.8.2.2 Bridge Decks
Replace the entire text with the following:

(1) Do not place concrete for bridge decks when the ambient air temperature is above 80° F.

(2) For concrete placed in bridge decks, submit a written evaporation control plan at each pre-pour meeting. In that plan, outline the actions the contractor will take to maintain concrete surface evaporation at or below 0.15 pounds per square foot per hour. Do not place concrete for bridge decks without the engineer's written acceptance of that evaporation control plan. If the engineer accepts an evaporation control plan calling for ice, the department will pay $0.75 per pound for that ice. Perform the work as outlined in the evaporation control plan.

(3) If predicting a concrete surface moisture evaporation rate exceeding 0.15 pounds per square foot per hour, do not place concrete for bridge decks.

(4) Provide evaporation rate predictions to the engineer 24 hours prior to each bridge deck pour.

(5) Compute the evaporation rate from the predicted ambient conditions at the time and place of the pour using the nomograph, or computerized equivalent, specified in CMM 5.25, figure 1. Use weather information from the nearest national weather service station. The engineer will use this information to determine if the pour will proceed as scheduled.

(6) At least 8 hours before each pour, the engineer will inform the contractor in writing whether or not to proceed with the pour as scheduled. If the actual computed evaporation rate during the pour exceeds 0.15 pounds per square foot per hour, at the sole discretion of the engineer, the contractor may be allowed to implement immediate corrective action and complete the pour. If the engineer allows the placement to continue, the department will pay $0.75 per pound for the quantity of ice required to maintain the concrete surface evaporation at or below 0.15 pounds per square foot per hour.

501.5 Payment
Replace paragraph three with the following:

(3) The department will pay for ice used to cool concrete in hot weather as specified in 501.3.8.2 and as modified herein, under the item Ice HPC Hot Weather Concreting included in the contract.

501.2.9 Concrete Curing Materials
Replace the entire text of the third paragraph with the following:

(3) Furnish burlap conforming to AASHTO M182, class 1, 2, 3 or 4.

502.3.2.1 Detailed Plans
Replace the entire text with the following:

(1) As specified in standard spec 105.2, submit four copies of detailed plans and computations for falsework, signed and sealed by a professional engineer registered in the State of Wisconsin, three weeks prior to erection of falsework for review and acceptance. Acceptance of the detailed plans and computations will in no way relieve the contractor of the responsibility of providing a safe and stable structure, and obtaining satisfactory results.

502.3.5.4 Superstructures
Delete paragraph six.

502.3.7.8 Floors
Replace paragraph five with the following:

(5) Set the rails or tracks that the finish machine rides on, to the required elevation; and ensure they adjust to allow for settlement under load. Support the rails or tracks outside the limits of the finished riding surface. Do not support rails or tracks on the tops of girders, or within the finished riding surface, without written permission of the engineer.

Delete paragraph thirteen, fourteen and fifteen.

Add the following to the end as paragraphs nineteen, twenty, twenty-one, twenty-two, and twenty three:

(19) Do not place bridge deck concrete more than 10 feet ahead of the finishing machine. If there is a delay of more than 10 minutes during the placement of a bridge deck, cover all concrete (unfinished and finished) with wet burlap to protect the concrete from evaporation until placement operations resume.

(20) Keep hand finishing, except for the edge of deck, to a minimum. Equip the finishing machine with a pan behind the screed. Apply micro texture using a broom or turf drag following the use of a 10-foot straight edge. Only finish by hand as necessary to close up finished concrete. Begin wet curing the deck immediately following the micro texture.

(21) For bridge decks with a design speed of 40 mph or greater, provide longitudinal grooving according to the provision included in this contract.

(22) Place HPC Masonry Structures for bridge decks during nighttime hours. Begin work no earlier than two hours before sunset and end no later than 2 hours after sunrise; unless alternate begin and end times are approved prior to the concrete placement by the engineer. To determine acceptable hours, use the sunset and sunrise times published by the National Weather Service for the proposed date of the concrete placement or as mutually agreed to by the contractor and the engineer.

(23) Provide lighting as necessary to safely perform the required work and facilitate inspection during nighttime hours. Ensure that lighting does not interfere with or impede traffic on open roadways and does not cause glare, shine or directly face the eyes of oncoming drivers. After initial setup, drive through and observe the lighted work area from each direction on the main roadway. Adjust lighting alignment if lighting causes glare, shine or directly faces the eyes of oncoming drivers

502.3.8.1 General
Replace paragraph one with the following:

(1) Maintain adequate moisture throughout the concrete mass to support hydration for at least 14 days.

502.3.8.2.1 General
Replace the entire text with the following:

(1) Wet-cure the concrete for bridge decks, structural approach slabs, sidewalks on bridges and raised medians on bridges for 14 days by use of a soaker hose system, or other engineer-approved methods. Cover the finished surface of bridge decks and overlays with one layer of saturated burlap or saturated cotton mats within 10 minutes after the finishing machine has passed. Apply the burlap/cotton gently so as to minimize marking of the fresh concrete. Keep the first layer of burlap/cotton continuously wet until the bridge deck or overlay is sufficiently hard to apply a second layer of saturated burlap/cotton. Immediately after applying the second layer of burlap/cotton, continue to keep the deck wet until placing and activating the soaker hose system. Throughout the remainder of the curing period, keep the burlap/cotton continuously wet with soaker hoses hooked up to a continuous water source. Inspect the burlap/cotton twice daily to ensure the entire surface is moist. If necessary, alter the soaker hose system as needed to ensure the entire surface is completely covered and stays moist. After 48 hours from the time of completion of the bridge deck or overlay pour, the soaker hose system and burlap/cotton may be covered with polyethylene sheeting. Provide a continuous flow of water through the soaker hose system for the entire curing period.

(2) Do not uncover any portion of the deck at any time for any reason during the first 7 days of the curing period except as permitted by the engineer.

(3) Set up and test the fogging system before each bridge deck, structural approach slab, bridge mounted sidewalk or bridge mounted raised median pour. Keep the fogging system set up and operational for the duration of the pour.

502.3.8.2.3 Decks
Delete the entire text.

502.3.8.2.4 Parapets
Replace the entire text with the following:

(1) Cure the inside and outside concrete faces and tops of railings or parapets by covering with saturated burlap immediately after form removal and surface finish application. Keep the burlap thoroughly wet for at least 7 days; or by covering for the same period with thoroughly wet polyethylene-coated burlap conforming to standard spec 502.2.6.4

(2) Secure coverings along all edges to prevent moisture loss.

502.3.9.6 Bridge Decks
Replace paragraph two with the following:

(2) Protect the underside of the deck, including the girders, for bridge deck and overlay pours by housing and heating when the national weather service forecast predicts temperatures to fall below 32° F during the cold weather protection period. Maintain a minimum temperature of 40° F in the enclosed area under the deck for the entire 14-day curing period.

502.5.1 General
Replace paragraph one with the following:

(1) The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price and incidentals necessary to complete the work under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.4000	HPC Masonry Structures	CY

Lighting for nighttime bridge deck placement is included in the item HPC Masonry Structures and will not be measured or paid for separately.

710.5 Sampling and Testing
Add the following subsection:

710.5.7 Chloride Penetration Resistance

(1) For each new or changed mix design, measure chloride penetration resistance according to AASHTO T 277 (Rapid Chloride Permeability Test) at a frequency of 1 test per 3 months (quarterly) of production.

(2) Strip permeability samples for AASHTO T 277 testing of their molds and wet cure to an age of 7 days in a standard moist room or water tank. After 7 days, submerge the samples in water heated to 100° F until an age of 28 days. Upon completion of the curing process, obtain one sample from each cylinder and test according to AASHTO T 277.

(3) Ensure that the initial accepted mix designs meet the chloride penetration resistance limit of 1500 coulombs based on the AASHTO T 277 Rapid Chloride Permeability test. Chloride resistance testing conducted quarterly using AASHTO T 277 Rapid Chloride Permeability Test during production will not be used for acceptance of previously accepted mixes and concrete masonry mixed and placed according to the contract requirements. For quarterly chloride resistance test results exceeding 1500 coulombs, the department may require adjustment of the concrete mix going forward to improve the chloride penetration resistance.

715.2.3.2 Structures

Replace paragraph one with the following:

(1A) Develop and test each mix to be used for HPC Masonry Structures. Produce a laboratory trial mix for each mix, as well as a trial mix from each plant used to supply the project. Test all mixes at a department-qualified laboratory.

(1B) The laboratory trial mix data must include the results of the following tests:

1. AASHTO T 119 Slump of Hydraulic Cement Concrete.
2. AASHTO T 121 Mass per Cubic Foot, Yield
3. AASHTO T 152 Air Content.
4. AASHTO T 22 Compressive Strength.
5. AASHTO T 277 Rapid Determination of the Chloride Permeability of Concrete, using the modified curing procedure according to 710.5.7 (2) herein.
6. AASHTO T 309 Temperature.
7. Water Cement Ratio.

(1C) The 28-day compressive strength must be greater than or equal to 4000 psi. The 28-day results of the permeability test must be less than or equal to 1500 coulombs.

Replace paragraph two with the following:

(2) Provide a minimum cementitious content of 470 pounds per cubic yard and a maximum cementitious content of 540 pounds per cubic yard. For all superstructure and substructure concrete, unless the engineer approves otherwise in writing, conform to one of the following:

1. Use class C fly ash or grade 100 or 120 slag as a partial replacement for Portland cement. For binary mixes use 15% to 30% fly ash or 20% to 30% slag. For ternary mixes use 15% to 30% fly ash plus slag in combination. Percentages are stated as percent by weight of the total cementitious material in the mix.
2. Use a type IP or IS blended cement.

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144. Concrete Masonry Soldier Pile Footings, Item SPV.0035.4010.

A Description
Work under this item consists of furnishing and placing concrete in predrilled holes for soldier piles and installation of soldier piles. Perform work in accordance to pertinent parts of the standard specifications, the plans, and these special provisions.

B Materials
Provide and use concrete masonry for Concrete Masonry Soldier Pile Footings conforming to grade A or grade A-FA as specified in standard spec 501.

C Construction
Before placing concrete masonry give the engineer sufficient notice to allow inspection of the predrilled holes, soldier piles, and casting preparations. For concrete masonry solider pile footings constructed without the use of slurry, no more than 3 inches of standing water is permitted in the bottom of the drilled hole prior to beginning solider pile installation and immediately prior to placing concrete masonry in the hole around the solider pile. If necessary, place up to 2 feet of concrete at the bottom of the hole to assist in aligning the soldier pile. Block or clamp the soldier pile in place at the ground surface before placing concrete.

For holes drilled or excavated without slurry, the department will allow the contractor to place concrete by free-falling the concrete from the ground surface down the shaft around the soldier pile. If temporary casing is used, begin placement of the concrete before removing the casing. Remove the casing while the concrete remains workable. For holes drilled or excavated using slurry, place concrete using a tremie method from the bottom of the shaft. Withdraw the tremie pipe slowly as the level of concrete rises in the shaft and never let the level of the tremie pipe outlet exceed the height of the slurry.

D Measurement
The department will not measure Concrete Masonry Soldier Pile Footings. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.4010	Concrete Masonry Soldier Pile Footings	CY

Payment for Concrete Masonry Soldier Pile Footings is full compensation for furnishing all materials, pumping, placing, finishing, curing, protecting, and heating for installation of soldier piles.

145. Lightweight Foamed Concrete Fill Grade 1, Item SPV.0035.4020; Lightweight Foamed Concrete Fill Grade 2, Item SPV.0035.4030.

A Description

A.1 General

This special provision describes designing, providing and placing Lightweight Foamed Concrete Fill, hereafter referred to as LFCF material, for backfill and embankments at locations designated on the plans.

A.2 Terms

Whenever in this article the following terms are used, the intent and meaning shall be interpreted as follows:

LFCF Manufacturer – The manufacturer of the foam agent used to make LFCF.

LFCF Installer – The subcontractor responsible for batching, and mixing the LFCF onsite, and placing the LFCF in accordance to the contract documents.

Contractor – General contractor as defined in the standard specifications.

B Materials

B.1 General

Furnish materials meeting the following requirements:

Portland Cement and Portland Pozzolan Cement	standard spec 501.2.1
Water	standard spec 501.2.4
Air Entraining Admixtures	standard spec 501.2.2
Water Reducing Admixtures	standard spec 501.2.3
Set Retarding Admixtures	standard spec 501.2.3
Curing Materials	standard spec 502.2.6
Fly Ash	standard spec 501.2.6
Dampproofing	standard spec 516.2.1

Pozzolans and admixtures (for accelerating, water reducing, retaining, improving the bond, etc.) may only be used if specifically designated and approved by the LFCF manufacturer.

B.2 LFCF Material Specifications

The foaming agent from the selected manufacturer will produce a Lightweight Foamed Concrete Fill Material, complying with the specifications in Table 1 below.

Table 1 – LFCF Material Requirements

Property	Grade 1 (Fill BelowTop 3 Feet of LFCF)	Grade 2 (Fill Within Top 3 Feet LFCF)	Test Method
Cast Density (after pumping)	36.0 - 40.0 pcf	44.0 - 50.0 pcf	ASTM C 796
Maximum Dry Density	34.0 pcf	46.0 pcf	ASTM C 796
Minimum Dry Density	30.0 pcf	40.0 pcf	ASTM C 796
Unconfined Compressive Strength	20 psi minimum at 24 hours curing 70 psi minimum at 28 days curing	25 psi minimum at 24 hours curing 120 psi minimum at 28 days curing	ASTM C 796
Frost Heave	< 0.5 in	< 0.5 in	British Road Research Laboratory, Lab Report LR 90, 1967, by Croney, Jacobs. Sample @ 250 hr exposure, 4.5 inches high x 4 inch dia.
Freeze-Thaw Resistance – minimum cycles @ relative E = N/N ≥ 70% per ASTM C666* as modified below	NA	Relative Young's Modulus, E ≥ 70% at 100 cycles.	ASTM C 666* as modified below
Coefficient of permeability	1 x 10^{-5} cm/sec 2.0 psi	1 x 10^{-5} cm/sec 2.0 psi	ASTM D-96

B.3 Modifications to ASTM C 666

The ASTM C666 modifications are as follows:

a. The temperature of the center of the specimens does not have to rise from 3°F to 37°F in less than 50% of the thaw cycle. Also the temperature of the center of specimen does not have to drop from 37°F to 3°F in less than 50% of the freeze cycle.

b. The freeze-thaw cycle does not have to be completed within the 4-hour maximum time limit. A complete freeze-thaw cycle for the 30 pcf material (3°F to 37°F and 37°F to 3°F including the requirement that it be completed in 50% of the time period) is estimated to last approximately 10 hours.

C Construction

C.1 Submittals

C.1.1 LFCF Placement Plan

Submit a LFCF quality control and placement plan. Place the abutment backfill and embankment in accordance to the information provided in the submitted, accepted plan. No later than two weeks prior to LFCF placement, submit the plan to the engineer for review and comment. Do not begin LFCF production before the plan has been reviewed and accepted by the engineer. The submitted plan shall provide, as a minimum, the following elements:

1. An organizational chart including names, telephone numbers, current certifications and/or titles, and roles and responsibilities of all those involved with the quality control program.
2. The process of communication by which quality control information will be disseminated to the appropriate persons**,** including materials suppliers. This shall include a list of recipients, the communication means that will be used, action time frames**,** and report formats.
3. Materials list of items proposed to be provided under this section.
4. Specifications, catalog cuts, and other engineering data needed to demonstrate compliance with the specified requirements.
5. Proof of LFCF installer's compliance with the requirements in section C2, to include a list of projects with completion date, owner's name and phone number, and contact person.
6. Mix designs for the LFCF, prepared by the LFCF manufacturer or installer, showing compliance with the specified properties.
7. Certification of batch, mixing and placing equipment by the LFCF installer meeting the requirements of section C.3 hereinafter.
8. Written documentation that LFCF installer is certified by and approved by the foam agent manufacturer.
9. LFCF curing procedures.

C.1.2 Trial Batch Design and Testing

At least two weeks prior to placement, prepare a trial batch and submit trial batch testing results showing that the proposed LFCF material properties comply with the requirements of this specification. The accepted trial batch mix design and tested properties will become the standard of the material furnished under this contract.

C.1.3 Quality Assurance Samples

At least two weeks prior to placing, submit 10 each 3-inch diameter by 6-inch high cylinder samples of the as designed and tested LFCF to the department. Cover specimens after casting to prevent loss of moisture. Do not oven dry specimens. At the department's option, the samples may be tested for strength and density in accordance to the requirements of ASTM 495 and ASTM C796 to verify the submitted test results and validate the contractor's testing procedures and quality of the furnished product.

C.2 Personnel Requirements

The Lightweight Foamed Concrete Fill installer, hereafter referred to as the LFCF installer, shall be certified by the manufacturer of the foaming agent and regularly engaged in the production and placement of the Lightweight Foamed Concrete Fill (LFCF). This shall include the completion of lightweight foamed concrete fills having a minimum of 10,000 total cubic yards in the past 5 years. Furthermore, the material shall have been successfully applied on at least three LFCF projects, consisting of mass fills for Federal and State highways, which have performed satisfactorily for at least five years.

The LFCF installer shall be certified and approved in writing by the foam agent manufacturer. The installer's foreman shall have a minimum of 2 years experience in this work and shall have worked on at least one of the three successful LFCF projects.

The LFCF installer shall use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work noted in this specification.

The foam agent manufacturer's representative (LFCF Manufacturer) shall be experienced in the placement of LFCF and shall be on site full-time during placement.

C.3 Equipment Requirements

The specialized batching, mixing, and placing equipment shall be automated and certified for this purpose by the manufacturer of the LFCF material. Bulk cement shall be weighed on a scale which operates within a tolerance of one half of one percent (0.5%) per batch. Foam shall be added and mixed at the site using the aforementioned equipment. Transit mixers and volumetric batching mixers are not acceptable.

C.4 Required Contractor Testing

The contractor is responsible for conducting acceptance testing and providing test results to the engineer prior to and during the installation of the LFCF.

C4.1 Cast Density of Field Installed LFCF

Test cast density in accordance to ASTM C 796

1. Prior to placement of the initial batch, the installer shall check the density and adjust the mix as required to obtain the manufacturer's specified cast density at point of placement.
2. At hourly intervals during placement, monitor the density and adjust as necessary to maintain the specified cast density.

C.4.2 Strength Testing

Conduct strength testing in accordance to ASTM C 796 except do not oven dry the test specimens.

1. Furnish a sufficient quantity of molded and cured cylinders measuring 3-inches in diameter by 6-inches high for required strength tests. Provide molds, and a similar curing environment of the LFCF being tested. Prepare cylinders in accordance to ASTM C1064.
2. Provide certified strength test results to the engineer for acceptance. At a minimum, conduct a set of three strength tests at 1, 2, and 28 day intervals for each 500 cubic yards of LFCF placed and a minimum of two sets of four cylinders each per day.

C.5 Laboratory Requirements

Perform the LFCF compressive strength testing at a department qualified laboratory. Information on the Wisconsin Laboratory Qualification Program may be obtained from the Quality Management Section, Wisconsin department of Transportation, Bureau of Highway Construction, Truax Center, 3502 Kinsman Blvd., Madison, WI, 53704; telephone (608) 266-3246; or on the internet at: www.dot.state.wi.us. If approved by the department, the compressive testing may also be conducted at the LFCF manufacturer's facility with test results reported as noted.

C.6 Placement

LFCF shall be a homogeneous mixture and all materials shall be approved prior to use.

Prepare the areas to be filled in accordance to standard spec 206.3.8. Remove standing water in the test areas prior to placement of the LFCF. Ensure the LFCF remains above the water table at all times during construction.

Subgrade for LFCF fill will be prepared in accordance to standard spec 211.

Protect material before, during and after installation, and protect the work and materials of other trades. In the event of damage, immediately make replacements and repairs to the acceptance of the engineer at no additional cost to the department.

If the LFCF must be placed in freezing susceptible conditions, consult the manufacturer as to what precautions are necessary to assure installation of an acceptable LFCF. Do not place LFCF at a temperature of less than 32 degrees Fahrenheit, nor when freezing conditions are expected in less than 24 hours, unless precautions are taken to maintain temperatures above freezing. Do not place LFCF on frozen ground or material.

Cure LFCF in accordance to the accepted placement plan.

Proportion, mix, and place LFCF only using equipment approved by the manufacturer as indicated in the accepted LFCF placement plan. Once mixed, convey the LFCF concrete promptly to the location of placement without excessive handling.

Place LFCF in lifts not exceeding 24-inches in depth unless greater depths are allowed on the plans**.**

Scarify each lift before placing the next lift. Scarify each lift to a minimum depth of 12 mm (½-inch) using a hand rake or other suitable means. When LFCF is used as backfill within MSE wall anchor zones, take special care when scarifying to not disturb the alignment of or physically damage the MSE wall reinforcing strips/mesh. Scarify after sufficient curing time such that foot traffic will not excessively damage the lift surface (no greater than 6 mm (¼ inch) indentation). Remove any loose debris or material as a result of the scarification process by blowing or other suitable means before placing the next LFCF lift.

Allow a minimum of one day (24 hours) between subsequent lifts. Prior to verification of the minimum specified compressive strength by testing, additional lifts may be placed after the one day minimum at the contractor's risk. Any material that does not meet the minimum specified strength within 28 days shall be removed and replaced by the contractor at no additional cost.

Move the discharge hose(s) sufficiently to ensure level filling through the specified fill area. Uneven filling is not permitted.

Limit the area of placement to the volume that can be placed within one hour, up to the maximum 0.61 m (2 foot) lift height. Stagger placements such that the vertical joints are at least 3 m (10 feet) apart except at designated vertical slip joints.

Where indicated on the plans, form a vertical slip joint across the entire width of LFCF embankments. The slip joint shall consist of a cold-formed joint in the LFCF, created by placing the LFCF on one side of the joint against a vertical rigid form. After removal of the form, place the LFCF on the opposite side of the joint against the previously placed LFCF with a suitable bond breaker between the placements. Bond breaker shall be plastic sheeting, geotextile fabric, or other means acceptable to the engineer.

The discharge hose length shall not exceed 244 m (800 feet) in length.

Place LFCF to the limits and grades shown in the plans with top of the LFCF within $\pm$ 0.1 foot of the elevations shown on the plans. Slope the top of the LFCF as indicated on the plans to provide drainage and prevent the ponding of water on the top of the LFCF. If not achieved at the time of placement, the top slope can be achieved by cutting, grinding or excavating the cured LFCF using methods approved by the engineer provided this is done in such a manner to leave a reasonably smooth, free draining surface without damaging the integrity of the underlying LFCF that remains.

Paving machines, heavy construction equipment or other unusual loading of the LFCF shall not be permitted until it has attained the specified 28-day compressive strength and the loading is approved by the engineer.

Sawing or ripping of the LFCF for utilities, underdrain or other conflicts will be by methods approved by the engineer. Backfill such cuts and excavations into the LFCF to the original top of LFCF elevation using the same grade of LFCF material that was removed.

C.7 Dampproofing

Apply dampproofing conforming to standard spec 516 to the final horizontal and vertical surfaces of the LFCF material at locations designated on the plans.

C.8 Acceptance

Rectify any LFCF material rejected by the engineer that does not meet the minimum required material properties or is not installed in accordance to this article. Corrective measures are subject to the approval of the engineer. Accepted corrected measures will be performed by the contractor at no additional cost to the department or extension of contract time. This includes removal and replacement of rejected LFCF material not meeting the minimum material requirements or installed in accordance to this article.

D Measurement

The department will measure Lightweight Foamed Concrete Fill Grade 1 and Lightweight Foamed Concrete Fill Grade 2, by the cubic yard of LFCF material acceptably placed within the limits shown on the plans in accordance to this specification. LFCF material placed outside the limits shown on the plans will not be measured for payment unless authorized in advance of placement by the engineer.

When indicated on the plans, LFCF placed as backfill within the anchor zone of Mechanically Stabilized Earth (MSE) retaining walls in lieu of granular backfill, will not be measured separately for payment, and will be included in the cost of item Wall Concrete Panel Mechanically Stabilized Earth.

E Payment.

The department will pay for measured quantities at the contract unit price under the following bid item

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.4020	Lightweight Foamed Concrete Fill Grade 1	CY
SPV.0035.4030	Lightweight Foamed Concrete Fill Grade 2	CY

Payment is full compensation for preparation of written submittals; material testing; coordination and scheduling of LFCF placement; onsite LFCF Manufacturer representative, specialized equipment to mix, transport and place LFCF; providing and erecting forms; bond breakers; and for groundwater control and temporary shoring.

Dampproofing will be measured and paid for separately in accordance to standard spec 516.

146. Temporary Crosswalk/Sidewalk, Item SPV.0045.0100.

A Description

This special provision describes maintaining accessible crosswalks/sidewalks crossing the construction zone. Maintaining accessible crosswalks/sidewalks consists of maintaining a crosswalk/sidewalk on existing pavement, new pavement, or temporary surface material.

B Materials

Furnish a hard temporary surface material consisting of asphaltic surface temporary in accordance to standard spec 465, any grade of concrete, skid resistant steel plating, or alternative material as approved by the engineer. Gravel or base course material is not acceptable.

C Construction

Install, maintain, move, and remove temporary surface material at temporary crosswalk/sidewalk locations as shown on the plans and as directed by the engineer. Level and compact the surface prior to placing temporary surface material. Provide a minimum clear width of 4 feet; be located outside the immediate work area, as approved by the engineer; meeting the requirements of the current Americans with Disabilities Act Accessibility Guidelines (ADAAG). Reconstruct or relay temporary crosswalk/sidewalk when disturbed by construction operations or utility trenches.

D Measurement

The department will measure Temporary Crosswalk/Sidewalk by the day, acceptably completed. The measured quantity will equal the number of calendar days a crosswalk/sidewalk through the work area, as shown on the traffic control plans, is open to pedestrian traffic. A crosswalk is defined as an accessible crossing of a single leg of an intersection. A sidewalk is defined as an accessible path between two intersections. A crossing of a street with an island within the route will be considered a single crosswalk. Each day that the crosswalk/sidewalk is out of service for more than 2 hours will result in one day being deducted from the quantity measured for payment.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0045.0100	Temporary Crosswalk/Sidewalk	Day

Payment is full compensation for furnishing, loading, hauling; for preparing the foundation; for furnishing, placing, maintaining, and removing temporary surface material; and for reconstructing or relaying the temporary surface material.

147. Truck or Trailer-Mounted Attenuator, Item SPV.0045.0400.

A Description

(1) This special provision describes protecting work operations with a truck or trailer-mounted attenuator (TMA).

B Materials

(1) Furnish and maintain a TMA conforming to NCHRP Report 350 test level 3 or to MASH crashworthiness criteria. Submit written certification from the manufacturer that the host vehicle/attenuator configuration provided conforms to crashworthiness criteria. Include the federal-aid reimbursement eligibility letter with that submittal.

(2) Provide a host vehicle and mount the attenuator conforming to the attenuator manufacturer's specifications. Provide the engineer a copy of the manufacturer's specifications and installation instructions.

C Construction

(1) Coordinate with the engineer at least 72 hours before its intended use so the engineer can determine if the work operation requires TMA protection.

(2) Position the attenuator at a manufacturer-recommended location in advance of a stationary work operation. Position and maintain the attenuator consistently at the manufacturer-recommended distance from a mobile work operation. Ensure that an operator stays with the host vehicle while protecting a mobile work operation.

D Measurement

(1) The department will measure Truck or Truck-Trailer-Mounted Attenuator by the day acceptably completed, measured to the 1/2-day based on the engineer-determined time the attenuator is required to protect work operations. The department will measure 4 or less hours per calendar day as a half day and over 4 hours as a full day.

E Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0045.0400	Truck or Trailer-Mounted Attenuator	Day

(2) Payment is full compensation for providing the portable attenuator, host vehicle, and operator.

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148. Portable Speed Trailer, Item SPV.0045.0401.

A Description

This special provision describes furnishing, hauling, placing, erecting, re-erecting, operating, maintaining, moving and removal of portable speed trailers during the construction of this project.

B Materials

Furnish portable speed trailer that is according to the pertinent requirements of standard spec 643 and the Manual on Uniform Traffic Control Devices (MUTCD), latest edition.

Provide a battery powered device with a regulatory speed limit sign and a radar speed sign displaying speed in mph.

C Construction
Furnish, haul, place, erect, re-erect, operate, maintain, move, and remove devices at locations as shown on the plans and as directed by the engineer.

Coordinate the placement and duration of these devices with the engineer.

Accommodate the placement of these devices within the project. Provide an area to park the devices that is still visible to traffic.

Move devices not performing as intended to the satisfaction of the engineer within 24 hours.

D Measurement
The department will measure Portable Speed Trailer by the day acceptably completed. For this special provision, the number of days measured is defined as the number of calendar days that the portable speed trailer is used in moving operations or short-term stationary work. A calendar day begins with each deployment within a defined time period and exceeding two hours.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0045.0401	Portable Speed Trailer	Day

Payment is full compensation for furnishing, hauling, placing, erecting, re-erecting, operating, maintaining, moving and removal of portable speed trailers during the construction of this project.

149. Dynamic Late Merge System, Item SPV.0045.2000.

A Description
This special provision describes furnishing, installing, operating, maintaining, monitoring, and removing a dynamic late merge system (DLMS) and/or delay time system as shown in the plans as necessary during construction work. The DLMS and/or delay time system are types of Intelligent Work Zone Systems. Actual deployment locations to be determined in the field by the engineer and vendor/manufacturer based on ramp locations and other field conditions.

B Materials
Provide a DLMS consisting of static traffic control signs with temporary flashing beacons, Portable Changeable Message Signs (PCMS), Traffic Detectors (TD), and an Automated System Manager (ASM) per direction of traffic flow.

B.1 Portable Changeable Message Signs (PCMS)
Provide PCMSs in accordance to the bid item 643.1050 Traffic Control Signs PCMS.

B.2 Static Traffic Control Signs with Temporary Flashing Beacons
Provide static traffic control signs with temporary flashing beacons in accordance to standard spec 658.2.2, Traffic Signal Faces.

B.3 Traffic Detectors (TD)
Provide TDs that are non-intrusive and capable of capturing traffic speed (mph) and traffic volume. Arrange coordination between the vendor/manufacturer and the engineer as to quantity and location of TDs, and as to which specific detectors shall collect speed and volume data, and for what duration. The location of the TDs may not correspond with the location of the PCMSs.

B.4 Automated System Manager (ASM)
Provide ASM that assesses current traffic data captured by the TDs, determine the appropriate merging strategy based upon pre-determined criteria, and communicate appropriate messages to the traveling public through the PCMS. Provide real-time data from the ASM to a website. Locate the ASM within the project limits or house at a remote facility of the vendor's choosing.

Provide access to the ASM website, including speed and volume data, and current PCMS message, to project staff.

B.5 Data
Provide speed and volume data that are available to the department's staff at all times for the duration of work zone activity. Historical data should be password protected and stored on the website for each day the system is in use, with date and time stamps included. Provide an electronic copy of all data to the department staff each week for the duration of work zone activity and until the DLMS has been removed.

B.6 System Acceptance
At time of bid, submit vendor verification that the system will adequately perform the functions specified in this special provision. Adequate verification includes past successful performance of the system in Wisconsin, successful deployments in neighboring states, literature and references from successful use of the system by other agencies, and/or demonstration of the system to designated department staff upon request.

Furnish all testing and calibration equipment.

C Construction
C.1 General
Provide a DLMS that accommodates a minimum of four distinct traffic conditions: Free Flow, Congestion, Loss of DMS Communication, and Manual Override.

Have the system in place and operational system seven days in advance of the start of lane closures.

C.2 System Operation Strategy

Arrange that the vendor/manufacturer coordinate system operation, detection, trends/thresholds, and messaging parameters with the engineer; the Southeast Region Work Zone Engineer, Bill Wondrachek, (414) 313-2276; the department's Bureau of Traffic Operations representative, Marie Treazise, (414) 225-3720; and the construction contractor.

Free Flow:

The free flow traffic conditions are to be determined by WisDOT, but typical traffic conditions that warrant this strategy may include:

Trend of vehicle speeds at two points above an adjustable parameter. This parameter should be set for optimal results based on on-site monitoring and review as directed by the engineer.

Typically greater than 50 mph may be utilized as a guideline.

A trend of vehicle volume between two points below an adjustable parameter. This parameter should be set for optimal results based on on-site monitoring and review as directed by the engineer. Typically less than 1000 vehicles/hour/lane may be utilized as a guideline.

A trend including increased vehicle speeds together with reduced volume. These parameters should be set for optimal results based on on-site monitoring and review as directed by the engineer.

During Free Flow conditions, display no lane use messages, and therefore allow traffic to resume typical early merge operation.

Congestion:

The congestion traffic conditions are to be determined by WisDOT, but typical traffic condition warrants may include:

A trend of vehicle speeds at two points below an adjustable parameter. This parameter should be set for optimal results based on on-site monitoring and review as directed by the engineer. Typically less than 45 mph may be utilized as a guideline.

A trend of vehicle volume between two points above an adjustable parameter. This parameter should be set for optimal results based on on-site monitoring and review as directed by the engineer. Typically greater than 1500 vehicles/hour/lane may be utilized as a guideline.

A trend including reduced vehicle speeds together with increased volume. These parameters should be set for optimal results based on on-site monitoring and review as directed by the engineer.

When traffic conditions warrant a change to the late merge strategy, activate the temporary flashing beacons and display lane use messages on the PCMS. Messages for congestion traffic conditions are below. Locate the PCMS in advance of the lane closure as determined by the engineer and system provider based upon estimated queue lengths and project geometry.

Quantity and approximate locations of PCMS for various stages are shown in the plans.
PCMS located at point of merge shall display:

MERGE HERE – TAKE TURNS

Intermediate PCMS located beyond IH 94 Westbound exit ramp gore to 84th Street:

MERGE AHEAD – USE ALL LANES

PCMS located beyond estimated maximum queue length:

IH 94 WESTBND – BACKUPS AHEAD

Loss of Communication:
If the DLMS has a loss of communication between the TD locations, display the following:

ROAD WORK AHEAD – LEFT/RIGHT LANE CLOSED.

Manual Override
If the DLMS is needed to provide additional information due to other traffic concerns, the engineer will have the capability to manually override the PCMS display. The WisDOT Statewide Traffic Operations Center will also have the capability via website to change messages. Arrange that the vendor/manufacturer document all override messages.

C.3 Calibration and Testing

After the DLMS has been installed, the vendor shall successfully perform a field test and calibration at the DLMS location to verify the system is detecting accurate vehicle speeds and volumes, accurately relaying the information to the ASM and then to the PCMS.

Verify that the traffic flow information (speeds and volumes) obtained from each TD is within +/- 5 percent of each of two 10- minute manual data periods.

D Measurement

The department will measure DLMS per each system complete per day. Arrange that the vendor/manufacturer provide technical personnel for all system calibration, operation, maintenance, and timely on-call support services.

Any day in which the DLMS is not working properly for more than 30 minutes will result in one day being deducted from the quantity measured for payment. It is the engineer's sole discretion to assess the deductions for an improperly working DLMS. There will be

no deductions in payment if the engineer decides not to use the DLMS at anytime, even though the DLMS is fully functioning.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0045.2000	Dynamic Late Merge System	Day

Payment is full compensation for furnishing, installing, operating, maintaining, monitoring, and removing the complete system, including Portable Changeable Message Signs (PCMS), Traffic Detectors (TD), an Automated System Manager (ASM), data, system acceptance, and traffic control signs with temporary flashing beacons.

150. Work Zone Construction Traffic Merge Warning System, Item SPV.0045.2001.

A Description

This special provision describes furnishing, installing, integrating, calibrating, making functional, and maintaining a work zone construction traffic merge warning system to provide advance warning of construction vehicles merging into the traffic stream to traffic upstream of the construction zone. The warning system must be functional at all times the respective work zone is in use.

This system will include one solar powered portable dynamic message sign, a wireless sensor to detect construction vehicle traffic as it is about to merge into the traffic stream, and communications between the sensor and the portable dynamic message sign that will activate the sign upon detection of a merging construction vehicle.

B Materials

Detection.

Traffic detection for the system may be determined by the contractor but must be non-intrusive to the roadway pavement.

Possible systems include, but are not limited to, microwave radar vehicle detectors and video vehicle detectors.

Power for the detection system must be supplied with the detector system and may include, but not be limited to, a solar power generation system, a conventional power generator and battery and battery charger system, or any other self-sufficient power system the contractor chooses.

The power generation and batteries system for the signs shall be designed to operate 24 hours per day, 7 days per week in Wauwatosa, WI for the months included in the project.

Quantity and location of the detectors shall also be determined by the contractor.

Signing.

- Furnish one portable solar powered dynamic message signs. The sign must consist of a full-matrix LED display and be capable of displaying a minimum of three rows of eight characters each spaced between 3-inches and 4-1/2-inches apart. Characters shall be 17-inches high and 11-inches wide. The maximum sign width shall be eleven 11-feet 6-inches.

- The sign controller shall have a memory system to store sign settings to prevent power failure from causing loss of sign settings.

- The signs shall have ambient light controlled continuous dimming with a minimum range of 100 percent to 40 percent for the sign display.

- The sign controller local interface shall not be permanently installed in the sign. Local control shall be through a hand-held, or otherwise removable, interfaces system to prevent unauthorized local control of the sign.

- The signing system must be operable within this overall system to display pre-programmed messages for a user-definable time when activated by the vehicle detection subsystem of this system.

- The solar power generation and batteries system for the signs shall be designed to operate 24 hours per day, 7 days per week in Wauwatosa, WI for the months included in the project.

Communications.

- Communications between the vehicle detector system and the portable changeable message signs may include, but not be limited to, wireless contact closure, wireless serial data, or wireless Ethernet radios.

- All communications systems within this system shall be certified to be compliant with all pertinent F.C.C. regulations.

C Construction

The system must be submitted, approved, deployed, calibrated, and made operational before any work is done within the respective construction zones.

Submit for approval a written and illustrated plan for the system a minimum of four weeks prior to the planned deployment of the system. Include material cut sheets for detectors, communications devices, portable signs, and any controllers.

The plan must show detailed locations of necessary devices such as vehicle detectors.

Relocate the portable dynamic message signs, detectors, and other devices as necessary due to traffic control changes, staging changes, or work zone length changes.

D Measurement

Work Zone Construction Traffic Merge Warning System will be measured as a unit, completely installed, integrated, calibrated, made functional, and maintained through the project duration.

E Payment

The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0045.2001	Work Zone Construction Traffic Merge Warning System	Day

Payment is full compensation for installing, configuring, calibrating, making functional, and maintaining the Work Zone Construction Traffic Merge Warning System; and for testing.

151. Exposing Existing Utility Unpaved Area, Item SPV.0060.0003.

A Description

This work includes exposing existing utilities which are in direct conflict with proposed facilities. The location of existing utilities not in direct conflict with proposed facilities is not included and shall be addressed using standard utility location procedures. The work includes exposing existing utilities under unpaved surfaces more than 6 feet outside a paved surface, and providing both lateral and depth measurements for use in determining potential utility conflict solutions.

B Materials

B.1 Granular Backfill

Furnish granular backfill that conforms to standard spec 209.

C Construction

C.1 General

Obtain engineer approval prior to performing the work, submitting all requests for exposing existing utilities in writing. Coordinate utility exposures with the engineer and notify the utility owner or their agents of this work two working days in advance so that they may be present when the work commences.

C.2 Excavation

Remove all unpaved surfaces at locations where the existing utility is being exposed. Maintain drainage at all times in accordance to standard spec 205.3.3. Take precautions, including temporary shoring, in order to prevent any undermining of the existing roadway. Perform work in accordance to all applicable laws, ordinances, rules, regulations, and OSHA standards.

Expose all utility locations within a given location to a minimum depth of 18-inches below the bottom of each utility. Excavate in a manner that protects the integrity of the utilities and prevents any damage to wrappings or protective coatings such as by any mechanical method or hand digging. Notify the utility owner promptly if damage or interruption of service occurs. Repair all damage caused to such utilities resulting from negligence or carelessness at own expense.

Take all lateral and depth measurements in US feet and tenths thereof. Identify horizontal locations of each exposed utility with a coordinate northing and easting referenced to the Wisconsin County Coordinate System (WCCS), Milwaukee County, NAD 83 (GRS-1980) (2007). Provide vertical elevations for each exposed utility and reference to NAVD 88 (2007).

The utility location shall remain exposed and available for visual inspection until the completion of all work in a given location. If the utility shall remain exposed overnight or for prolonged periods of time, protect the location with traffic-rated steel plating, safety barriers, and all necessary traffic control devices that may be required under applicable standards or as directed by the engineer.

C.3 Backfilling

Upon completion of the utility exposure, restore the location in kind to its original condition. Use granular backfill, conforming to standard spec 209, to backfill the exposed utility locations to the subgrade elevation except for areas located within local streets. All granular material placed to an elevation of 18-inches above each exposed utility shall consist substantially of sand with all particles retained on a one-inch (25.0 mm) sieve removed. The remaining granular material shall conform to the specifications for backfill for trench excavation. In grassy areas, place 6-inches of topsoil, seed and mulch, and fertilizer. Alternate restoration methods may be used upon written approval from the engineer.

C.4 Documentation

Provide documentation to the engineer and include the coordinates, elevations, and sketches of the utility locations tied to known features in the plans. Reference each utility to a proposed alignment with a station and offset. Where near a ramp, reference the ramp alignment. Document the size and/or diameter, composition, and a description of each utility and the location of the elevation with respect to each utility noted. Supply digital photographs of the uncovered utility to the engineer in .jpeg format for future reference.

D Measurement

The department will measure Exposing Existing Utility, Unpaved Area as a unit for each location. A location may have multiple utilities located within the same exposure area. An exposure area will include all utilities within 6 lateral feet of each other, and payment will only be made for one unit regardless of the number of utilities exposed. The department will pay for the item as a single unit of work for each 6-foot increment of exposure measured vertically from the existing ground elevation located above the existing utility to a point 18 inches below the exposed utility.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0003	Exposing Existing Utility Unpaved Area	Each

Payment is full compensation for furnishing all excavation; for disposing of all materials; for locating all utilities within each respective location; for providing documentation and photographs of utility locations to the engineer; for furnishing all surveying associated with exposing existing utilities; for furnishing all maintenance of the location during construction; for furnishing all traffic control, safety barriers, and steel plating required; and for temporary shoring.

152. Exposing Existing Utility Paved Area, Item SPV.0060.0004.

A Description

This work includes exposing existing utilities which are in direct conflict with proposed facilities. The location of existing utilities not in direct conflict with proposed facilities is not included and shall be addressed using standard utility location procedures. The work includes exposing existing utilities under paved surfaces or within 6 feet of a paved surface, and providing both lateral and depth measurements for use in determining potential utility conflict solutions.

B Materials

B.1 Backfill Slurry

Use aggregates that conform to standard spec 501 for grade A concrete. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily.

C Construction

C.1 General

Obtain engineer approval prior to performing the work, submitting all requests for exposing existing utilities in writing. Coordinate utility exposures with the engineer and notify the utility owner or their agents of this work two working days in advance so that they may be present when the work commences.

C.2 Excavation

Remove all paved surfaces at locations where the existing utility is being exposed. Saw or remove concrete and asphaltic pavements to the nearest joint. Remove all pavement surfaces in such a way that all existing edges consist of a true line having a perpendicular edge with no unraveling. Maintain drainage at all times in accordance to standard spec 205.3.3. Take precautions, including temporary shoring, in order to prevent any undermining of the existing roadway. Perform work in accordance to all applicable laws, ordinances, rules, regulations, and OSHA standards.

Expose all utility locations within a given location to a minimum depth of 18-inches below the bottom of each utility. Excavate in a manner that protects the integrity of the utilities and prevents any damage to wrappings or protective coatings such as by any mechanical method or hand digging. Notify the utility owner promptly if damage or interruption of service occurs. Repair all damage caused to such utilities resulting from negligence or carelessness at own expense.

Take all lateral and depth measurements in US feet and tenths thereof. Identify horizontal locations of each exposed utility with a coordinate northing and easting referenced to the Wisconsin County Coordinate System (WCCS), Milwaukee County, NAD 83 (GRS-1980) (2007). Provide vertical elevations for each exposed utility and reference to NAVD 88 (2007).

The utility location shall remain exposed and available for visual inspection until the completion of all work in a given location. If the utility shall remain exposed overnight or for prolonged periods of time, protect the location with traffic-rated steel plating, safety barriers, and all necessary traffic control devices that may be required under applicable standards or as directed by the engineer.

C.3 Backfilling

Upon completion of the utility exposure, restore the location in kind to its original condition. When exposed utility locations fall within local streets or city right-of-way, use slurry backfill to fill the entire location to the subgrade elevation.

Restore concrete pavement and concrete base course to the depth found in the existing roadway. Replace all locations that fall within live lanes of any roadway or pedestrian traffic with a high early-strength concrete pavement mix design having a depth equivalent to the existing pavement structure unless directed otherwise by the engineer. Locations that are closed to through traffic may use an approved concrete pavement mix conforming to standard spec 501. If directed by the engineer, tie concrete pavement and/or dowel it to the existing pavement according to the standard detail drawing for concrete pavement. All locations requiring asphaltic pavement shall consist of HMA Pavement Type E-3 unless otherwise directed by the engineer. Place the HMA pavement in lifts to a depth as directed by the engineer. Apply tack coat to composite pavement structures and between lifts.

Place base aggregate dense between the subgrade surface and the bottom of the pavement.

C.4 Documentation

Provide documentation to the engineer and include the coordinates, elevations, and sketches of the utility locations tied to known features in the plans. Reference each utility to a proposed alignment with a station and offset. Where near a ramp, reference the ramp alignment. Document the size and/or diameter, composition, and a description of each utility and the location of the elevation with respect to each utility noted. Supply digital photographs of the uncovered utility to the engineer in .jpeg format for future reference.

D Measurement

The department will measure Exposing Existing Utility, Paved Area as a unit for each location. A location may have multiple utilities located within the same exposure area. An exposure area will include all utilities within 6 lateral feet of each other and payment will only be made for one unit regardless of the number of utilities exposed. The department will pay for the item as a single unit of work for each 6-foot increment of exposure measured vertically from the existing ground elevation located above the existing utility to a point 18 inches below the exposed utility.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0004	Exposing Existing Utility Paved Area	Each

Payment is full compensation for furnishing all excavation; for disposing of all materials; for locating all utilities within each respective location; for providing documentation and photographs of utility locations to the engineer; for furnishing all surveying associated with exposing existing utilities; for furnishing all maintenance of the location during construction; for furnishing all traffic control, safety barriers, and steel plating required; for furnishing and placing backfill slurry; for temporary shoring, and all finishing items including, but not limited to, base aggregate dense, concrete pavement, HMA pavement, curb and gutter, and sidewalk located above the subgrade elevation.

153. Baseline CPM Progress Schedule, Item SPV.0060.0005; Monthly CPM Progress Schedule Updates, Item SPV.0060.0006.

Replace standard spec 108.4 with the following:

108.4 Critical Path Method Progress Schedule

108.4.1 Definitions

The department defines terms used in standard spec 108.4 as follows:

Activity

An administrative or construction task performed during the course of the project with a defined duration, and scheduled (or actual) start and finish dates.

Critical Path

The longest continuous chain of activities through the CPM schedule that establishes the minimum overall project duration.

Construction Activity

Construction activities are discrete work activities performed by the contractor, subcontractors, utilities, or third parties within the project limits.

CPM Progress Schedule
A Critical Path Method (CPM) Progress Schedule is a network of logically related activities. The CPM schedule calculates when activities can be performed and establishes the critical or longest continuous path or paths of activities through the project.

Float
Float, as used herein, is the total float of an activity; i.e., it is the amount of time between the date when an activity can start (the early start), and the date when an activity must start (the late start). In cases where the total float of an activity has a different value when calculated based on the finish dates, the lower (more critical) value will govern.

Forecast Completion Date
The completion date predicted by the latest accepted CPM Update, which may be earlier or later than the contract completion date, depending on progress.

Fragnet
A group of logically-related activities, typically inserted into an existing CPM schedule to model a portion of the project, such as the work associated with a change order.

Initial Work Plan
The initial work plan is a time-scaled CPM schedule showing detailed activities for the first 90 calendar days of work and summary level activities for the remainder of the project.

Intermediate Milestone Date
A contractually required date for the completion of a portion of the work, so that a subsequent portion of the work or stage of traffic phasing may proceed.

Master Program Schedule
The department's schedule for the overall Zoo Interchange Freeway Program, including intermediate milestone dates and contract completion dates, and containing codes for use as a template for the development of the contractor's schedule.

Master Project Schedule
The department's schedule for the contract work, developed during design, and provided to the contractor for informational purposes only.

Work Breakdown Structure (WBS)
A framework for organizing the activities that make up a project by breaking the project into successively greater detail by level. A WBS organizes the project work. It does not address the sequencing and scheduling of project activities.

108.4.2 Department's Master Schedules

108.4.2.1 Master Project Schedule

If requested by a bidder or by the contractor, the department will supply its Master Project Schedule for the contract work, developed during design. The Master Project Schedule is not

a direction on how to perform the work. The Master Project Schedule reflects one possible approach to the work, consistent with the phasing requirements.

108.4.2.2 Master Program Schedule

Within five business days after award, the department will provide its current Master Program Schedule, containing intermediate milestone constraints, standard activity codes, and a standard WBS for the contractor to use to develop its schedule.

108.4.2.3 Use of Department's Master Schedules

The department's Master Schedules provide information to assist the contractor in preparing its schedule. The Master Schedules are not contract documents. The logic contained in the Master Schedules is not intended to alter or supplement contract requirements for the phasing of the work, but to reflect those requirements.

108.4.3 Contractor's Scheduling Responsibilities

Prepare and submit a CPM progress schedule that accurately reflects the plan for the performance of the work, based on the physical requirements of the Work, and Traffic Phasing requirements. The CPM schedule is the contractor's committed plan to complete all work within the completion deadlines. Full responsibility is assumed for the prosecution of the work as shown. The CPM schedule is not part of the contract. Schedule the Work in the manner required to achieve the completion date and intermediate milestone dates specified in the Prosecution and Progress Special Provision.

Use the department-provided Master Program Schedule as a template to develop the Initial Work Plan and the Baseline CPM Progress Schedule. Use the Master Program Schedule's ID coding structure to categorize activities by Contract, Stage, Location, and Responsibility to ensure compatibility with the Master Program Schedule and with schedules prepared by other contractors. Add additional activity codes as necessary, but do not delete the coding structure provided.

To ensure compatibility with the Master Program Schedule, use the latest version of Primavera Project Planner (P6), by Primavera Systems, Inc., Bala Cynwyd, PA to prepare the Initial Work Plan, Baseline CPM Progress Schedule, and Monthly CPM Updates.

Designate a Project Scheduler who will be responsible for scheduling the Work and submit a professional resume describing a minimum of three years of scheduling experience on urban, interstate-highway reconstruction work of similar size and complexity, including recent experience with P6.Obtain approval of the submitted resume prior to scheduling the work.

108.4.4 Submittals

108.4.4.1 Initial Work Plan

Within ten business days after the Initial Work Plan Workshop, as scheduled in standard spec 103.10, submit an Initial Work Plan consisting of the following:

1. Develop the Initial Work Plan using the Master Program Schedule as a template.

2. Provide a detailed plan of activities to be performed within the first 90 calendar days of the contract. Provide construction activities with durations not greater than 28 calendar days (20 business days), unless the engineer accepts requested exceptions.

3. Provide activities as necessary to depict administrative work, including submittals, reviews, and procurements that will occur within the first 90 calendar days of the contract. Activities other than construction activities may have durations greater than 28 calendar days (20 business days). Allow 21 calendar days (15 business days) for department review of submittals.

4. Provide summary activities for the balance of the project. Summary activities may have durations greater than 28 calendar days (20 business days).

5. Submit three copies of the Initial Work Plan in a compressed (XER) format on three separate CDs.

6. The engineer will accept the contractor's Initial Work Plan or provide comments within five business days after receipt of the Initial Work Plan. Address comments and resubmit the Initial Work Plan as necessary. Do not begin work until the engineer accepts the Initial Work Plan. The department will use the initial work plan to monitor the progress of the work until the Baseline CPM Progress Schedule is accepted.

7. Submit an updated version of the Initial Work Plan on a monthly basis until the engineer accepts the Baseline CPM Progress Schedule. With each update, include actual start dates, completion percentages, and remaining durations for activities started but not completed. Include actual finish dates for completed activities.

108.4.4.2 Baseline CPM Progress Schedule

Within 15 business days after the CPM Scheduling Workshop, as scheduled in standard spec 103.10, submit a Baseline CPM Progress Schedule and written narrative consisting of the following:

Supplement standard spec 108.4.4.2(1) with the following:

4. Submit a temporary drainage plan showing the interface between various stages of a project as well as the interface with adjacent projects.

1. Develop the Baseline CPM using the Master Program Schedule as a template. The Baseline CPM is the contractor's committed plan to complete the Work within the time frames required to achieve the contract completion date and Intermediate milestone dates. The department will use the schedule to monitor the progress of the work. Include the following:

1.1 Provide a detailed plan of activities to be performed during the entire contract duration, including all administrative and construction activities required to complete the work as described in the contract documents. Provide construction activities with durations not greater than 28 calendar days (20 business days), unless the engineer accepts requested exceptions.

1.2 Provide activities as necessary to depict administrative work, including submittals, reviews, procurements, inspections, and all else necessary to complete the work as described in the contract documents. Activities other than construction activities may have durations greater than 28 calendar days (20 business days). Allow 21 calendar days (15 business days) for department review of submittals.

1.3 Provide activities as necessary to depict third party work related to the contract.

1.4 Make allowance for specified work restrictions, non-working days, time constraints, calendars, and weather; and reflect involvement and reviews by the department, and coordination with adjacent contractors, utility owners, and other third parties.

1.5 With the exception of the Project Start Milestone and Project Completion Milestone, all activities must have predecessors and successors. The start of an activity shall have a Start-to-Start or Finish-to-Start relationship with preceding activities. The completion of an activity shall have a Finish-to-Start or Finish-to-Finish relationship with succeeding activities. Do not use Start-to-Finish relationships. Do not use Finish-to-Start relationships with a lag unless the engineer accepts requested exceptions.

1.6 Schedule all intermediate milestones in the proper sequence and input as either a "Start-no-Earlier-Than" or "Finish-no-Later-Than" date. Provide predecessors and successors for each intermediate milestone as necessary to model each Stage of the Work. Unless the engineer accepts a requested exception, the schedule should encompass all the time in the contract period between the starting date and the specified completion date.

1.7 Using the bid quantities and unit prices, develop an anticipated cash-flow curve for the project, based on the Baseline CPM.

2. Provide three hard copies of a hand-drawn or electronically drafted logic diagram depicting the CPM network. Organize the logic diagram by grouping related activities, based on the activity codes in the CPM.

3. Provide a written narrative with the baseline CPM explaining the planned sequence of work, as-planned critical path, critical activities for achieving intermediate milestone dates, traffic phasing, and planned labor and equipment resources. Use the narrative to further explain:

3.1 The basis for activity durations in terms of production rates for each major type of work (number of shifts per day and number of hours per shift), and equipment usage and limitations.

3.2 Use of constraints.

3.3 Use of calendars.

3.4 Estimated number of adverse weather days on a monthly-basis.

3.5 Scheduling of permit and environmental constraints, and coordination of the schedule with other contractors, utilities, and public entities.

4. Submit three copies of the Baseline CPM in a compressed (XER) format on three separate CDs.

Within ten business days of receiving the Baseline CPM, the engineer will provide comments and schedule a meeting for the contractor to present its Baseline CPM and answer questions raised in the engineer's review.

At the meeting scheduled by the engineer, provide a presentation of the Baseline CPM. In the presentation, include a discussion of the staging and sequencing of the work, understanding of traffic phasing, and application of labor and equipment resources to the Work. Address comments raised in the engineer's review.

Within five business days after the meeting, the engineer will accept the contractor's Baseline CPM schedule or provide comments. Address the engineer's comments and resubmit a revised Baseline CPM within ten business days after the engineer's request. If the engineer requests justification for activity durations, provide information that may include estimated labor, equipment, unit quantities, and production rates used to determine the activity duration.

The engineer will accept the Baseline CPM based solely on whether the schedule is complete as specified in this standard spec. The engineer's acceptance of the schedule does not modify the contract.

The department will not consider requests for contract time extensions as specified in 108.10 or additional compensation for delay specified in 109.4.7 until the department accepts the Baseline CPM schedule.

108.4.4.3 Monthly CPM Updates

Submit CPM Updates on a monthly basis after acceptance of the Baseline CPM. With each CPM Update, include the following:

1. Actual start dates, completion percentages, and remaining durations for activities started but not completed, and actual finish dates for completed activities, through the final acceptance of the project.

2. Additional activities as necessary to depict additions to the contract by changes and logic revisions as necessary to reflect changes in the contractor's plan for prosecuting the work.

3. Include a narrative report that includes a brief description of monthly progress, changes to the critical path from the previous update, sources of delay, potential problems, work planned for the next 30 calendar days, and changes to the CPM schedule. Changes to the logic of the CPM schedule include the addition or deletion of activities and changes to activity descriptions, original durations, relationships, constraints, calendars, or previously recorded actual dates. Justify changes to the CPM schedule in the narrative by describing associated changes in the planned methods or manner of performing the work or changes in the work itself.

4. Submit three copies of each CPM Update in a compressed (XER) format electronically, as agreed to with the department.

5. If additions or changes were made to the CPM schedule since the previous update, submit an updated hard copy of the revised logic diagram.

6. Within five business days of receiving each CPM Update, the engineer will provide comments and schedule a meeting as necessary to address comments raised in the engineer's review. Address the engineer's comments and resubmit a revised CPM Update within five business days after the engineer's request.

108.4.4.4 Three-Week Look-Ahead Schedules

Submit Three-Week Look-Ahead Schedules on a weekly basis after NTP. The schedule can be hand drawn or generated by computer. With each Three-Week Look-Ahead include:

Activities underway and as-built dates for the past week.

Provide actual as-built dates for completed activities through final acceptance of the project.

3. Planned work for the upcoming two-week period.

4. The activities of the Three-Week Look-Ahead schedule shall include the activities underway and critical RFIs and submittals, based on the CPM schedule. The Three-Week Look-Ahead may also include details on other activities not individually represented in the CPM schedule.

5. On a weekly basis, the department and the contractor shall agree on the as-built dates depicted in the Three-Week Look-Ahead schedule or document any disagreements. Use the as-built dates from the Three-Week Look-Ahead schedules for the month when updating the CPM schedule.

108.4.4.5 Weekly Production Data

Provide estimated and actual weekly production rates for items of work on a weekly basis as follows:

1. Provide data on the following items by area or station:

    1.1 Retaining Walls
    a. Leveling Pads - LF
    b. Set Panels - SF
    c. Parapets - LF
    d. Wall Face - Bay
    e. Tie Backs – Each
    f. Anchor Slabs – LF
    g. Drilling - Each
    h. Coping – LF
    i. Footing - LF

    1.2 Bridge Construction
    a. Footings—Each
    b. Columns—Each
    c. Abutments—Each
    d. Pier Caps—Each
    e. Girder Spans – Each
    f. Decked Spans – Each
    g. Poured Spans – Each

    1.3 Roadway Excavation—CY per week

    1.4 Roadway Structural Section
    a. Grading/Subgrade Preparation—SY
    b. Base Material Placement—Ton
    c. Base Material Subgrade Preparation—SY
    d. Asphalt Pavement—Ton
    e. Concrete Pavement – SY

    1.5 Tunnels
    a. Drilled Shafts – Each
    b. Beam Seat/Cap - LF
    c. Girders - Each
    d. Deck – Percent

1.6 Noise Walls
   a. Drill/Set Ground Mounted Posts - Each
   b. Install Ground Mounted Panels - Each
   c. Anchor/Set Structure Mounted Posts - Each
   d. Install Structure Mounted Panels - Each

2. For each item, indicate the actual daily production for the past week and the anticipated weekly production for the next week.

3. Submit the data in an electronic spreadsheet format at the same time the Three-Week Look-Ahead is submitted. On a weekly basis, the department and the contractor shall agree on the production data or document any disagreements.

108.4.5 Progress Review Meetings

Weekly Progress Review Meetings—After completing the weekly submittal of the Three-Week Look-Ahead and production data, attend a weekly meeting to review the submittals with the department. At the meeting, address comments as necessary, and document agreement or disagreement with the department.

Monthly Update Review Meetings—After submitting the monthly update and receiving the engineer's comments, attend a job-site meeting, as scheduled by the engineer, to review the progress of the schedule. At that meeting, address comments as necessary, and document agreement or disagreement with the department. The monthly meeting will be coordinated to take place on the same day and immediately before or after a weekly meeting, whenever possible.

108.4.6 CPM Progress Schedule Revisions

Revision by the contractor if necessary due to changes in the Work or project conditions and authorized by the engineer, a CPM Progress Schedule Revision may be submitted, although the next Monthly CPM Update is not yet due. Prepare the CPM Revision in the same format as required for Monthly CPM Updates, including justification for changes to the schedule. The process for comment and acceptance of a CPM Revision will be the same as for Monthly CPM Updates. If the CPM Revision is accepted, prepare the next monthly update based on the revised CPM. If the CPM Revision is rejected, prepare the next monthly update based on the previous month's update.

Engineer's Right to Request Revisions—The engineer will monitor the progress of the work and may request revisions to the CPM schedule. Revise the schedule as requested by the engineer, and submit a CPM Progress Schedule Revision within ten business days of the request. The process for comment and acceptance of a CPM Revision will be the same as for Monthly CPM Updates. The engineer may request that the contractor revise the CPM schedule for one or more of the following reasons:

1. The forecast completion date is scheduled to occur more than 14 calendar days after the contract completion date.

2. An intermediate milestone is scheduled to occur more than 14 calendar days after the date required by the contract.

3. The engineer determines that the progress of the work differs significantly from the current schedule.

4. A contract change order requires the addition, deletion, or revision of activities that causes a change in the contractor's work sequence or the method and manner of performing the work.

108.4.7 Documentation Required for Time Extension Requests

To request a time extension to an intermediate milestone date or the contract completion date associated with changes to the work, provide a narrative detailing the work added or deleted and the other activities affected, based on the latest accepted CPM Update. For added work, submit a proposed fragnet of activities to be added or revised in the CPM schedule, indicating how the fragnet is to be tied to the CPM schedule.

To request a time extension to an intermediate milestone date or the contract completion date associated with delays to the work, provide a narrative detailing the affected activities and the cause of the delay, based on the latest accepted CPM Update. Requests for time extensions due to delays should meet the following criteria:

1. For requests to extend the contract completion date, include a description of how the delay affected the project's critical path, based on the latest accepted CPM Update.

2. For requests to extend an intermediate milestone date, include a description of how the delay affected the controlling (longest) path to the milestone, based on the latest accepted CPM Update.

3. The department and the contractor agree that the float is not for the exclusive use or financial benefit of either party. Either party has the full use of the float on a first come basis until it is depleted.

108.4.8 Payment for CPM Progress Schedule

The department will pay for measured quantities at the contract unit price for work acceptably completed under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0005	Baseline CPM Progress Schedule	Each
SPV.0060.0006	Monthly CPM Progress Schedule Updates	Each

The department will only make progress payments for the value of materials, as specified in standard spec 109.6.3.2.1, until the Baseline CPM schedule has been submitted. The department will retain ten percent of each estimate until the department accepts the Baseline CPM schedule.

The department will only make progress payments for the value of materials, as specified in standard spec 109.6.3.2.1, until the Monthly CPM schedule updates have been submitted. The department will retain ten percent of each estimate until the department accepts the Monthly CPM schedule update.

Payment is full compensation for furnishing all work required under these bid items. The department will pay the contract unit price for the Baseline CPM schedule after the department accepts the schedule. Thereafter, the department will pay the contract unit price for each Monthly CPM Update acceptably completed.

154. Removing High Mast Lighting Tower Concrete Base, Item SPV.0060.0010.

A Description

This special provision describes completely removing high mast lighting tower concrete bases that vary in diameter between 4'-0" and 4'-6" and vary in depth between 25' and 35'.

B (Vacant)

C Construction

Conform to standard spec 204.3. Backfill all trenches, holes, and pits with suitable fill material conforming to standard spec 209.

It is the responsibility of the contractor to provide access to the existing high mast lighting tower concrete base. Furnishing and placing all materials necessary to construct a path or support pad to assist the contractor in removing the concrete base is included in the Removing High Mast Lighting Tower Concrete Base bid item.

D Measurement

The department will measure Removing High Mast Lighting Tower Concrete Base as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0010	Removing High Mast Lighting Tower Concrete Base	Each

Payment is full compensation for removing and properly disposing of all materials; for furnishing all excavating; for placing and compacting backfill material; for furnishing and placing all materials necessary to provide access to the concrete base; and for furnishing and placing all materials required to support equipment used to remove the concrete base.

Removing the existing high mast lighting tower and lamp disposal will be paid for under separate items.

155. Removing High Mast Lighting Tower, Item SPV.0060.0011.

A Description

This special provision describes removing and disposing of existing high mast lighting towers, having varying heights ranging between 75 feet and 175 feet, and other accessories.

B (Vacant)

C Construction

At least five working days prior to the start of removing high mast lighting tower, notify the WisDOT lighting engineer. Safely disconnect power to the high mast lighting tower. Remove bolts and all materials above the existing concrete base including but not limited to the tower, lowering mechanism, ring and cables. Dispose of all removed material at an offsite location.

Return functioning luminaires to the department. Dispose of nonfunctioning luminaires per applicable regulations.

Deliver luminaires to the department at the South 60th Street office in West Allis. Consolidate all deliveries into a truckload or more, except when all the luminaires removed under a contract measure less than a truckload, deliver as one load at one time. Contact Mike Prebish at (414) 266-1170, Monday through Thursday from 8:00 AM to 4:00 PM to set up an appointment for delivery.

It is the responsibility of the contractor to provide access to the existing high mast lighting tower. Furnishing and placing all materials necessary to construct a path or support pad to assist the contractor in removing the tower is included in the Removing High Mast Lighting Tower bid item.

D Measurement

The department will measure Removing High Mast Lighting Tower by the individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0011	Removing High Mast Lighting Tower	Each

Payment is full compensation for removing and properly disposing of all materials; for contacting the WisDOT lighting engineer; for disconnecting power; for delivering functioning luminaires to the department; for furnishing and placing all materials necessary to provide access to the lighting tower; and for furnishing and placing all materials required to support equipment used to remove the towers.

Removing the existing high mast lighting tower concrete base and lamp disposal will be paid for under separate items.

156. Removing Grout Pipe, Item SPV.0060.0012.

A Description

This special provision describes Removing Grout Pipe in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided. Remove portion and or all parts of grout pipe three feet below finished surface elevation prior to base course placement or as directed by the engineer. Dispose of all removed material at an offsite location.

B (Vacant)

C Construction

Backfill the space that is excavated but not occupied by the new permanent construction in accordance to standard spec 206.3.13.

D Measurement

The department will measure Removing Grout Pipe by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item.

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0012	Removing Grout Pipe	Each

Payment is full compensation for removing grout pipe, excavation, backfilling, furnishing and hauling materials.

157. Removing Utility Vault, Item SPV.0060.0015.

A Description

This special provision describes completely or partially removing utility vaults, including manholes, and disposing of all resulting materials in accordance to the plans, standard specifications, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), and as hereinafter provided.

The utility vaults generally vary in size from 4 feet by 6 feet to 8 feet by 12 feet and the utility manholes generally vary in diameter from 4 feet to 8 feet. The utility vault walls vary in thickness between 8 inches and 18 inches and vary in depth between 4 feet and 10 feet.

Removing and abandoning storm sewer manholes and sanitary sewer manholes will be paid for under separate items.

B Materials

Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material as directed by the engineer.

C Construction

Obtain approval from the engineer before removing utility vault. Perform work in accordance to standard spec 204 and as hereinafter provided. The contractor is responsible for the safe methods and sequence of controlled removal operations.

As directed by the engineer, completely remove the utility vault or break down and remove walls and foundations, including all attached parts and connections, to the extent required to avoid interfering with new construction work.

Thoroughly clean the ends of the existing pipes or ducts and bulkhead the existing utility connections to remain with brick or concrete block masonry, or with any grade of concrete specified under standard spec 501.3.1.3, or any engineer-approved commercial grade of concrete, or plug by other engineer-approved method.

Backfill all excavations or voids not occupied by other work under this contract in accordance to standard spec 204.3.1.2.

All materials generated during removal activities are the property of the contractor. Dispose of removed material as specified for disposing of materials in standard spec 203.3.4. This includes, but is not limited to; frames, grates, adjusting rings, bricks, mortar, concrete foundation, conduit, hangers, racks, wiring, pipe, and fittings.

D Measurement

The department will measure Removing Utility Vault by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0015	Removing Utility Vault	Each

Payment is full compensation for furnishing all excavating; for breaking down the utility vault; for cutting and removing the utility vault; for furnishing any required brick, concrete block, or concrete; for furnishing all plugging and bulkheading; for furnishing all backfilling; for furnishing, placing, and compacting Backfill Granular; and for hauling and disposing of all materials.

158. Removing Old Sign Structure S-40-155, Item SPV.0060.0021; S-40-164, Item SPV.0060.0022; S-40-200, Item SPV.0060.0023; S-40-203, Item SPV.0060.0024; S-40-230, Item SPV.0060.0025; S-40-262, Item SPV.0060.0026; S-40-27, Item SPV.0060.0027; S-40-308, Item SPV.0060.0028; S-40-310, Item SPV.0060.0029; S-40-311, Item SPV.0060.0030; S-40-312, Item SPV.0060.0031; S-40-33, Item SPV.0060.0032; S-40-36, Item SPV.0060.0033; S-40-37, Item SPV.0060.0034; S-40-38, Item SPV.0060.0035; S-40-391, Item SPV.0060.0036; S-40-408, Item SPV.0060.0037; S-40-954, Item SPV.0060.0038; S-40-202, Item SPV.0060.0039; S-40-279, Item SPV.0060.0040; S-40-48, Item SPV.0060.0041; S-40-379, Item SPV.0060.0042.

A General

Work under these items consists of removing existing sign structures and their concrete base foundations and disposing of resulting materials in accordance to standard spec 203 and as hereinafter provided.

Removal of signs will be measured and paid for under other items.

B (Vacant)

C Construction

Remove and dispose of the existing superstructure (columns and overhead trusses) and concrete foundations of each sign structure.

D Measurement

The items of Removing Old Sign Structure S-40-155, S-40-164, S-40-200, S-40-203, S-40-230, S-40-262, S-40-27, S-40-308, S-40-310, S-40-311, S-40-312, S-40-33, S-40-36, S-40-37, S-40-38, S-40-391, S-40-408, S-40-954, S-40-202, S-40-279, S-40-48, and S-40-379 will be measured as a unit for each specific sign structure removed in accordance to the contract.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0021	Removing Old Sign Structure S-40-155	Each
SPV.0060.0022	Removing Old Sign Structure S-40-164	Each
SPV.0060.0023	Removing Old Sign Structure S-40-200	Each
SPV.0060.0024	Removing Old Sign Structure S-40-203	Each
SPV.0060.0025	Removing Old Sign Structure S-40-230	Each
SPV.0060.0026	Removing Old Sign Structure S-40-262	Each
SPV.0060.0027	Removing Old Sign Structure S-40-27	Each
SPV.0060.0028	Removing Old Sign Structure S-40-308	Each
SPV.0060.0029	Removing Old Sign Structure S-40-310	Each
SPV.0060.0030	Removing Old Sign Structure S-40-311	Each
SPV.0060.0031	Removing Old Sign Structure S-40-312	Each
SPV.0060.0032	Removing Old Sign Structure S-40-33	Each
SPV.0060.0033	Removing Old Sign Structure S-40-36	Each
SPV.0060.0034	Removing Old Sign Structure S-40-37	Each
SPV.0060.0035	Removing Old Sign Structure S-40-38	Each
SPV.0060.0036	Removing Old Sign Structure S-40-391	Each
SPV.0060.0037	Removing Old Sign Structure S-40-408	Each
SPV.0060.0038	Removing Old Sign Structure S-40-954	Each
SPV.0060.0039	Removing Old Sign Structure S-40-202	Each
SPV.0060.0040	Removing Old Sign Structure S-40-279	Each
SPV.0060.0041	Removing Old Sign Structure S-40-48	Each
SPV.0060.0042	Removing Old Sign Structure S-40-379	Each

Payment is full compensation for removing and disposing of all materials as set forth above including sign base foundations; for cutting off anchor bolts and conduits; and for sealing conduits.

159. Salvaging Crash Cushion, Item SPV.0060.0100.

A Description

This special provision describes removing and salvaging existing crash cushions in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C Construction

The existing crash cushions shall be removed and salvaged as shown on the plans. The contractor shall include the cost of any and all methods that may be needed for the expected removal of the materials under this bid item.

Salvage the existing crash cushions to the Milwaukee County Department of Public Works. Deliver the crash cushions to the highway maintenance facility at 10190 W. Watertown Plank Road, Milwaukee, WI. The contact for Milwaukee County is Mr. Kevin Peiffer, (414) 257-6566. Contact Mr. Peiffer five business days prior to removing the crash cushions.

D Measurement
The department will measure Salvaging Crash Cushion by the unit, acceptably removed and salvaged.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0100	Salvaging Crash Cushion	Each

Payment is full compensation for removing and delivering existing crash cushions.

160. Temporary Bus Stop Pad, Item SPV.0060.0101.

A Description
This special provision describes furnishing, maintaining, moving, and removing temporary pavement for Temporary Bus Stop Pads in the median during construction and for Temporary Bus Stop Pads in the terrace, as shown on the plans.

B Materials
Furnish asphaltic surface temporary in accordance to standard spec 465.2 (2) or furnish concrete in accordance to standard spec 602.2.

C Construction
Construct temporary bus stop pads 10 feet long by 8 feet wide (or the width of the terrace) that meet the requirements of the current Americans with Disabilities Act Accessibility Guidelines (ADAAG).

Form the foundation by excavating at least 3 inches. Tamp or compact the foundation to ensure stability.

Place two inches of Asphaltic Surface Temporary in accordance to standard spec 465.3.1 or place 3 inches of concrete in accordance to standard spec 602.3.2.3 or as the engineer directs, and as shown in the plan.

Separate temporary bus stop pads in the median from construction operations with temporary fencing with a minimum strength and height required to contain livestock, as approved by the engineer. Locate the temporary bus stop pads outside the immediate work area, as directed by the engineer. Connect temporary bus stop pads in the median to crosswalks, existing sidewalks, or permanent sidewalks.

Reconstruct or move temporary bus stop pads if required for utility installation or paving operations.

Temporary bus stop signs and poles will be furnished and installed by Milwaukee County Transit System.

D Measurement
The department will measure Temporary Bus Stop Pad as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0101	Temporary Bus Stop Pad	Each

Payment is full compensation for furnishing and installing all materials; for constructing; for reconstructing or moving; for removing; and for furnishing and installing temporary fence.
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161. Parking Lot Bollard, Item SPV.0060.0104.

A Description
This special provision describes providing and installing parking lot bollards as shown on the plans and as hereinafter provided.

B Materials
Furnish materials conforming to the following:

Round steel pipe of the size shown in the plans, conforming to 506.2.3.6.
Concrete Masonry Grade A, conforming to standard spec 501.
Epoxy paint system conforming to standard spec 517.

C Construction
Embed steel pipe in augured hole backfilled with concrete as shown in the plans. Set pipe plumb vertical. Brace pipe if necessary during and after concrete placement, to maintain plumb vertical orientation until concrete attains sufficient strength. Fill pipe with concrete and finish concrete with a smooth rounded top at the top of the pipe as shown in the plans.

Paint with finished top coat colors and pattern as shown in the plans. Paint may be applied in the field.

D Measurement
The department will measure Parking Lot Bollard by the unit installed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0104	Parking Lot Bollard	Each

Payment will be full compensation for furnishing, installing and painting the parking lot bollard.

162. Concrete Barrier Type S56 Special Light Pole Base, Item SPV.0060.0125; Concrete Barrier Type S56A Special Light Pole Base, Item SPV.0060.0126.

A Description

This special provision describes furnishing and installing special concrete barrier light pole bases as shown on the plans and as hereinafter provided.

B Materials

B.1 Concrete Barrier

Furnish materials in accordance to standard spec 603.2.

B.2 Concrete Bases

Furnish materials in accordance to standard spec 654.2.1, Concrete Bases.

B.3 Junction Boxes

Furnish 18 X 12 X 6 – inch 316 stainless steel junction boxes with a recessed cover. Junction box shall meet NEMA 4 standards for protection against windblown dust and rain and splashing water. Furnish standard covers with stainless steel hex-head mounting bolts with each box assembly. Boxes shall have a neoprene gasket with provision for allowing drainage out of the box.

Junction boxes shall be furnished with factory installed mounting buttons as required to attach grounding lugs and mechanical connectors as shown on the plans. Provide engineer-approved protection that totally and permanently seals connections with a silicone or rubberized caulk. One junction box per based is required.

B.4 Electrical Wiring Connectors

Furnish rubber insulated submersible secondary connectors rated for copper conductors (minimum 12 AWG) as required for splicing in each location. Secondary connectors shall include silicone grease and CO-OX oxide inhibitor and meet the performance requirements of ANSI C119.1 and C119.4.

B.5 Conduit, Fittings and Expansion/Deflection Couplings

Furnish rigid non-metallic schedule 40 PVC conduit and fittings as shown on the plans conforming to the pertinent provisions of standard spec 652.

Furnish UL listed expansion/deflection coupling joints as shown on the plans. Expansion/deflection coupling joints shall be rated for use with rigid metallic conduit and provide a watertight and corrosion resistant connection which allows for movement in all directions. Couplings shall maintain a constant inner diameter and provide a smooth insulated wireway for protection of the conductors. Couplings shall include an integral bonding jumper. Two couplings per base are required.

B.6 Anchor Bolt Assemblies
Furnish anchors of the size and spacing as given on the plans, and that conform to ASTM A449 or AASHTO M 314 GR 55. The upper 8 inches of the bolts, nuts, and washers shall be hot-dipped galvanized in accordance to ASTM A153, Class C. Provide enlarged threads on nuts for proper fit after galvanizing.

B.7 Expansion Material
Furnish 3/4-inch expansion material in accordance to standard spec 415.2.3, Expansion Joint Filler. Use elastic type joint filler to seal the surface of the expansion joint.

C Construction
Perform work in accordance to the pertinent requirements of standard specs 603.3 and 654.3, the plans, standard detail drawings, and as hereinafter provided.

Install junction boxes as shown in the plans and as the manufacturer directs.

Install expansion/deflection couplings as the manufacturer directs. Coordinate the connection of the conduit into the receiving roadway barrier prior to pouring the concrete base.

All secondary connectors and miscellaneous wiring, fusing and grounding connections shall be installed in accordance to standard spec 659.3.2 and as the manufacturer directs.

Provide two nuts and two washers per anchor bolt, and install per light standard manufacturer's recommendations.

D Measurement
The item will measure Concrete Barrier Type S56 Special Light Pole Base and Concrete Barrier Type S56A Special Light Pole Base by the unit, acceptably installed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0125	Concrete Barrier Type S56 Special Light Pole Base	Each
SPV.0060.0126	Concrete Barrier Type S56A Special Light Pole Base	Each

Payment for the Concrete Barrier Type S56 Special Light Pole Base and Concrete Barrier Type S56A Special Light Pole Base bid items is full compensation for furnishing and installing all materials including conduit, couplings, bushings, caps or plugs or both, anchor rods, nuts, washers, expansion material, grounding electrodes, exothermic welds, copper equipment grounding conductors, bar steel reinforcement, junction boxes, and concrete; for excavating, backfilling, and disposing of surplus materials; and for furnishing and installing the anchor bolt assemblies.

163. Concrete Barrier Transition Type G1, Item SPV.0060.0127; Concrete Barrier Transition Type G2, Item SPV.0060.0128; Concrete Barrier Transition Type G3, Item SPV.0060.0129; Concrete Barrier Transition Type G4, Item SPV.0060.0130; Concrete Barrier Transition Type G5, Item SPV.0060.0131; Concrete Barrier Transition Type G6, Item SPV.0060.0132; Concrete Barrier Transition Type G7, Item SPV.0060.0133; Concrete Barrier Transition Type G8, Item SPV.0060.0134; Concrete Barrier Transition Type G9, Item SPV.0060.0135; Concrete Barrier Transition Type G10, Item SPV.0060.0136; Concrete Barrier Transition Type G11, Item SPV.0060.0137; Concrete Barrier Transition Type G12, Item SPV.0060.0138; Concrete Barrier Transition Type M1, Item SPV.0060.0150; Concrete Barrier Transition Type M2, Item SPV.0060.0151; Concrete Barrier Transition Type M3, Item SPV.0060.0152.

A Description
Construct Concrete Barrier Transition (Type) in accordance to standard spec 603, details shown in the plans, and as hereinafter provided.

B Materials
Furnish materials conforming to standard spec 603.2.

C Construction
Use construction methods conforming to standard spec 603.3.

D Measurement
The department will measure Concrete Barrier Transition (Type) by each individual unit, acceptably placed in accordance to the contract.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0127	Concrete Barrier Transition Type G1	Each
SPV.0060.0128	Concrete Barrier Transition Type G2	Each
SPV.0060.0129	Concrete Barrier Transition Type G3	Each
SPV.0060.0130	Concrete Barrier Transition Type G4	Each
SPV.0060.0131	Concrete Barrier Transition Type G5	Each
SPV.0060.0132	Concrete Barrier Transition Type G6	Each
SPV.0060.0133	Concrete Barrier Transition Type G7	Each
SPV.0060.0134	Concrete Barrier Transition Type G8	Each
SPV.0060.0135	Concrete Barrier Transition Type G9	Each
SPV.0060.0136	Concrete Barrier Transition Type G10	Each

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0137	Concrete Barrier Transition Type G11	Each
SPV.0060.0138	Concrete Barrier Transition Type G12	Each
SPV.0060.0150	Concrete Barrier Transition Type M1	Each
SPV.0060.0151	Concrete Barrier Transition Type M2	Each
SPV.0060.0152	Concrete Barrier Transition Type M3	Each

Payment will be made in accordance to standard spec 603.5.

164. Pavement Marking Grooved Preformed Thermoplastic Arrows Type 1, Item SPV.0060.0300; Arrows Type 2, Item SPV.0060.0301; Arrows Type 3, Item SPV.0060.0302; Words, Item SPV.0060.0303; Arrows Type 4, Item SPV.0060.0306.

A Description

This special provision describes grooving the pavement surface, and furnishing and installing preformed thermoplastic pavement marking as shown on the plans, in accordance to standard spec 647, and as hereinafter provided.

B Materials

Furnish preformed thermoplastic pavement marking and sealant material, if required, from the department's approved products list.

C Construction

C.1 General

For quality assurance, provide the engineer and the region's Marking Section evidence of manufacturer training in the proper placement and installation of preformed thermoplastic pavement marking.

Plane the grooved lines in accordance to the plan details. Use grooving equipment with a free-floating, independent cutting or grinding head. Plane a minimum number of passes to create a smooth groove.

C.2 Groove Depth

Cut the groove to a depth of 120 mils ±10 mils deeper than the thermoplastic thickness, from the pavement surface or, if tined, from the high point of the tined surface. Measure depth using a straightedge placed perpendicular to the groove. The department may periodically check groove depths.

C.3 Groove Width – Linear Markings

Cut the groove 1-inch wider than the width of the thermoplastic.

C.4 Groove Position

Position the groove edge in accordance to the plan details.

C.4.1 Linear Marking
Groove at a minimum of 4-inches, but not greater than, 12-inches from both ends of the line segment. Achieve straight alignment with the grooving equipment.

C.4.2 Special Marking
Groove a box around the special marking up to 4 inches from the perimeter of the special marking.

C.5 Groove Cleaning
C.5.1 Concrete
Cooling the cutting head with water may be necessary for some applications and equipment. If cooling water is necessary, flush the groove immediately with water after cutting to remove any build-up of cement dust and water slurry. If this is not done, the slurry may harden in the groove.

If water is used in the grooving process, allow the groove to dry a minimum of 24 hours after groove cleaning, after removal of excess water, and prior to pavement marking application. Clean and dry the groove for proper application of the sealant, and placement of the pavement marking. Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove; use of the air blower does not decrease the amount of time required for the groove to dry.

C.5.2 New Asphalt
Groove pavement 10 or more days after paving. Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove.

C.5.3 Existing Asphalt
Check for structural integrity in supporting grooving operations. If the structural integrity of the asphalt pavement is inadequate to support grooving operations, immediately notify the engineer.

C.5.4 Asphalt
Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove.

C.6 Preformed Thermoplastic Application
Preheat the surface if necessary based on manufacturer's recommendation.

Application of the preformed thermoplastic in the groove without sealant will be as follows:

- May 1 to September 30, both dates inclusive – the Southeast Region and the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.
- June 1 to August 31 – the Southwest Region, and the Northeast, North Central, and Northwest Regions except for the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.

Application of the preformed thermoplastic in the groove with sealant materials will be as follows:

- October 1 to April 30, both dates inclusive – the Southeast Region and the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.
- September 1 to May 31, both dates inclusive – the Southwest Region and the Northeast, North Central, and Northwest Regions, except for the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.

The sealant must be wet.

D Measurement

The department will not measure Pavement Marking Grooved Preformed Thermoplastic (Type). The department will use pay plan quantity according to the Pay Plan Quantity article.

The department will measure Pavement Marking Grooved Preformed Thermoplastic Arrow Type 4 as each individual unit, acceptably completed.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article and for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0300	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 1	Each
SPV.0060.0301	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 2	Each
SPV.0060.0302	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 3	Each
SPV.0060.0303	Pavement Marking Grooved Preformed Thermoplastic Words	Each
SPV.0060.0306	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 4	Each

Payment is full compensation for cleaning and preparing the pavement surface, furnishing and installing the material.

165. Pavement Marking Grooved Contrast Preformed Thermoplastic Arrows Type 2, Item SPV.0060.0304; Words, Item SPV.0060.0305.

A Description

This special provision describes grooving the pavement surface, and furnishing and installing contrast preformed thermoplastic pavement marking as shown on the plans, in

accordance to standard spec 647 of the standards specifications, and as hereinafter provided.

B Materials
Furnish 125 mils preformed thermoplastic pavement marking from the department's approved products list. If required, furnish sealant material recommended by the manufacturer.

C Construction
C.1 General
For quality assurance, provide the engineer and the region's Marking Section evidence of manufacturer training in the proper placement and installation of preformed thermoplastic pavement marking.

Plane the grooved lines in accordance to the plan details. Use grooving equipment with a free-floating, independent cutting or grinding head. Plane a minimum number of passes to create a smooth groove.

C.2 Groove Depth
Cut the groove to a depth of 120 mils ±10 mils deep from the pavement surface or, if tined, from the high point of the tined surface. Measure depth using a straightedge placed perpendicular to the groove. The department may periodically check groove depths.

C.3 Groove Width – Linear Markings
Cut the groove 1-inch wider than the width of the thermoplastic.

C.4 Groove Position
Position the groove edge in accordance to the plan details.

C.4.1 Linear Marking
Groove at a minimum of 4-inches, but not greater than, 12-inches from both ends of the line segment. Achieve straight alignment with the grooving equipment.

C.4.2 Special Marking
Groove at a minimum of 4-inches from the perimeter of the special marking. Groove separate areas for Word Items.

C.5 Groove Cleaning
C.5.1 Concrete
Cooling the cutting head with water may be necessary for some applications and equipment. If cooling water is necessary, flush the groove immediately with water after cutting to remove any build-up of cement dust and water slurry. If this is not done, the slurry may harden in the groove.

If water is used in the grooving process, allow the groove to dry a minimum of 24 hours after groove cleaning, after removal of excess water, and prior to pavement marking application. Clean and dry the groove for proper application of the sealant, and placement of the pavement marking. Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove; use of the air blower does not decrease the amount of time required for the groove to dry.

C.5.2 Asphalt

Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove.

Check for structural integrity in supporting grooving operations. If the structural integrity of the asphalt pavement is inadequate to support grooving operations, immediately notify the engineer.

C.6 Preformed Contrast Thermoplastic Application

Preheat the surface if necessary based on manufacturer's recommendation.

Apply preformed thermoplastic in the groove as per manufacturer's recommendations. If manufacturer's recommendations require a sealant, apply a sealant lower than 91 g/l VOC during the following period of time due to Volatile Organic Compound Limitations:

May 1 to September 30, both dates inclusive – the Southeast Region and the ozone non-attainment Northeast Region counties of Sheboygan, Manitowoc, and Kewaunee.

Use any sealant in the remainder counties and for the remainder of the year. The sealant must be wet.

D Measurement

The department will measure Pavement Marking Grooved Contrast Preformed Thermoplastic by the unit, acceptably placed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0304	Pavement Marking Grooved Contrast Preformed Thermoplastic Arrows Type 2	Each
SPV.0060.0305	Pavement Marking Grooved Contrast Preformed Thermoplastic Words	Each

Payment is full compensation for cleaning and preparing the pavement surface, furnishing and installing the material.

166. Traffic Control Close-Open Freeway Entrance Ramp, Item SPV.0060.0400.

A Description

This item shall consist of furnishing the labor and equipment required for closing and subsequently opening a freeway entrance ramp in accordance to standard spec 643, the plans, and as directed by the engineer. Drums, barricades and signs may remain along the roadway when the exit ramp is open to traffic. Signs shall not be visible to traffic when the ramp is open. Drums, barricades and signs will be paid for separately under the various traffic control items.

B (Vacant)

C (Vacant)

D Measurement

The department will measure Traffic Control Close-Open Freeway Entrance Ramp by each individual traffic control, close-open freeway ramp, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0400	Traffic Control Close-Open Freeway Entrance Ramp	Each

Payment is full compensation for furnishing the labor and equipment for closing and subsequently opening a freeway entrance ramp.

167. Traffic Control Close-Open Freeway to Freeway System Ramp, Item SPV.0060.0401.

A Description

This item shall consist of furnishing the labor and equipment required for closing and subsequently opening a freeway to freeway system ramp in accordance to standard spec 643, the plans, and as directed by the engineer. Drums, barricades and signs may remain along the roadway when the system ramp is open to traffic. Signs shall not be visible to traffic when the system ramp is open. Drums, barricades, lights, arrow boards and signs will be paid for separately under the various traffic control items.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Traffic Control Close-Open Freeway to Freeway System Ramp by each individual traffic control, close-open freeway system ramp, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0401	Traffic Control Close-Open Freeway to Freeway System Ramp	Each

Payment is full compensation for furnishing the labor and equipment for closing and subsequently opening a freeway to freeway system ramp.

168. Traffic Control Interim Freeway Lane Closure, Item SPV.0060.0402.

A Description
This item shall consist of adjusting existing traffic control items that have previously been placed on the freeway for a lane closure, intended lane closure or are in position for staged construction as shown on the plans into position for an additional lane or two lane closures, and for readjusting the traffic control items to their original state or position upon removal of the additional lane or two lane closure within a 24 hour period. All work shall be in accordance to standard spec 643, the plans, and as directed by the engineer.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Traffic Control Interim Freeway Lane Closure as each individual freeway lane or two-lane closure is setup and subsequently removed per direction of traffic within a 24-hour time period, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0402	Traffic Control Interim Freeway Lane Closure	Each

Payment is full compensation for furnishing the labor and equipment for setup and subsequent removal per direction of traffic within a 24-hour time period of a freeway lane or two-lane closure.

169. Traffic Control Local Road Lane Closures, Item SPV.0060.0403.

A Description
Furnish the labor and equipment required for closing and subsequently opening a local road lane or lanes in accordance to standard spec 643, the plans, and as directed by the engineer. Drums and barricades may remain along the roadway when the local road is open to traffic. Handle signs according to the spec "Traffic Control Signs Not in Use" when the local road is open.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Traffic Control Local Road Lane Closures by each individual local road lane or two-lane closure that is set up and subsequently removed in each traffic direction within a 24 hour time period, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0403	Traffic Control Local Road Lane Closures	Each

Payment is full compensation for furnishing the labor and equipment for closing and subsequently opening a local road lane or lanes. Drums, barricades, lights, arrow boards and signs will be paid for separately under the various traffic control items.
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170. Traffic Control Covering Signs Type I Left In Place, Item SPV.0060.0404.

A Description
This special provision describes furnishing, installing, and maintaining Traffic Control Covering Signs Type I Left In Place as shown on the plans

Traffic Control Covering Signs Type I Left In Place become property of the department after final acceptance by the engineer.

B Material
Use materials in accordance to the pertinent provisions of standard spec 643.2.9 and as hereinafter provided. Sign covers shall be covered with green high intensity sheeting.

C Construction
Perform work in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Covering Signs Type I Left In Place by each individual sign cover, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0404	Traffic Control Covering Signs Type I Left In Place	Each

Payment is full compensation for furnishing, installing, and maintaining the Traffic Control Covering Signs Type I.

171. Temporary Sign Portable Support, Item SPV.0060.0405.

A Description
This special provision describes the construction of portable sign supports for fixed message signs as shown on the plans.

B Materials
Use lumber and hardware conforming to standard spec 507.

C Construction
Construct the Temporary Sign Portable Support in accordance to the detail on the plans.

D Measurement
The department will measure Temporary Sign Portable Support as each location, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item.

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0405	Temporary Sign Portable Support	Each

Payment is full compensation for furnishing and installing temporary sign portable supports; for removing the portable supports at the completion of the work.

172. Mobilizations Emergency Pavement Repair, Item SPV.0060.0406.

A Description
Furnish and mobilize personnel, equipment, traffic control, and materials to the project site to repair the existing pavement on an emergency basis as the engineer directs. An emergency is a sudden occurrence of a serious and urgent nature, beyond normal maintenance of the existing pavement.

B (Vacant)

C Construction
Mobilize with sufficient personnel, equipment, traffic control, materials and incidentals on the jobsite within 4 hours of the engineer's written order to repair the existing pavement on an emergency basis.

D Measurement
The department will measure Mobilizations Emergency Pavement Repair as each individual mobilization acceptably completed. The department will not include delivering and installing pavement repair or maintenance materials provided for in specific contract bid items. All traffic control items used for each Mobilization will be considered incidental to the Mobilization.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0406	Mobilizations Emergency Pavement Repair	Each

Payment is full compensation for the staged moving of personnel, moving equipment, setting up and removing traffic control, traffic control materials, and moving materials. The department will pay separately for delivery and installation of pavement repair materials under the other bid items in this contract. The department will not pay separately for traffic control items and materials even though they may be included in other bid items in this contract and will consider them incidental to each Mobilization.
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173. Installing State Furnished Signs, Item SPV.0060.0407.

A Description
This special provision describes installing state furnished signs and maintaining, moving, and removing signs including all posts and sign supports as shown on the plans and directed by the engineer.

Any signs, posts, and supports the engineer determines should be left in place become property of the department after final acceptance by the engineer.

B Materials
Signs will be furnished by the department. Furnish materials including posts, supports and hardware in accordance to the pertinent requirements of standard spec 643.2.

C Construction
Perform work in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

Remove signs, posts, and supports or leave in place at the completion of this contract as directed by the engineer.

D Measurement
The department will measure Installing State Furnished Signs by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0407	Installing State Furnished Signs	Each

Payment is full compensation for installing state furnished signs; for furnishing and installing all posts, sign supports, and hardware; for maintaining, moving, removing or leaving in place signs, posts, and supports as directed by the engineer.

174. Traffic Control Drums Left In Place, Item SPV.0060.0500.

A Description
This special provision describes furnishing, installing, and maintaining Traffic Control Drums Left In Place as shown on the plans.

Traffic Control Drums Left In Place becomes property of the department after final acceptance by the engineer.

B Materials
This work shall be in accordance to the pertinent provisions of standard spec 643.2.3 and as hereinafter provided.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Drums Left In Place as each drum acceptably left in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0500	Traffic Control Drums Left In Place	Each

Payment is full compensation for furnishing, installing, and maintaining the Traffic Control Drums.

175. Traffic Control Barricades Type II Left In Place, Item SPV.0060.0501.

A Description
This special provision describes furnishing, installing, and maintaining Traffic Control Barricades Type II Left In Place as shown on the plans.

Traffic Control Barricades Type II Left In Place becomes property of the department after final acceptance by the engineer.

B Materials
This work shall be in accordance to the pertinent provisions of standard spec 643.2.4 and as hereinafter provided.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Barricades Type II Left In Place as each barricade, acceptably left in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0501	Traffic Control Barricades Type II Left In Place	Each

Payment is full compensation for providing, installing, and maintaining the Traffic Control Barricades Type II.

176. Traffic Control Barricades Type III Left In Place, Item SPV.0060.0502.

A Description
This special provision describes furnishing, installing, and maintaining Traffic Control Barricades Type III Left In Place as shown on the plans.

Traffic Control Barricades Type III Left In Place becomes property of the department after final acceptance by the engineer.

B Materials
This work shall be in accordance to the pertinent provisions of standard spec 643.2.4 and as hereinafter provided.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Barricades Type III Left In Place as each barricade, acceptably left in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0502	Traffic Control Barricades Type III Left In Place	Each

Payment is full compensation for providing, installing, and maintaining the Traffic Control Barricades Type III.

177. Traffic Control Warning Lights Type A Left In Place, Item SPV.0060.0503.

A Description
This special provision describes furnishing, installing, and maintaining Traffic Control Warning Lights Type A Left In Place as shown on the plans.

Traffic Control Warning Lights Type A Left In Place becomes property of the department after final acceptance by the engineer.

B Materials
This work shall be in accordance to the pertinent provisions of standard spec 643 and as hereinafter provided.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 643.3.5.2, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Warning Lights Type A Left In Place as each working light acceptably left in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0503	Traffic Control Warning Lights Type A Left In Place	Each

Payment is full compensation for providing, installing, and maintaining the Traffic Control Warning Lights Type A.

178. Traffic Control Warning Lights Type C Left In Place, Item SPV.0060.0504.

A Description

This special provision describes furnishing, installing, and maintaining Traffic Control Warning Lights Type C Left In Place as shown on the plans.

Traffic Control Warning Lights Type C Left In Place becomes property of the department after final acceptance by the engineer.

B Materials

This work shall be in accordance to the pertinent provisions of standard spec 643 and as hereinafter provided.

C Construction

This work shall be in accordance to the pertinent provisions of standard spec 643.3.5.2, as shown on the plans, and as hereinafter provided.

D Measurement

The department will measure Traffic Control Warning Lights Type C Left In Place as each working light, acceptably left in place.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0504	Traffic Control Warning Lights Type C Left In Place	Each

Payment is full compensation for providing, installing, and maintaining the Traffic Control Warning Lights Type C.

179. Traffic Control Signs Left In Place, Item SPV.0060.0505.

A Description

This special provision describes furnishing, installing, and maintaining Traffic Control Signs Left In Place as shown on the plans.

Traffic Control Signs Left In Place becomes property of the department after final acceptance by the engineer.

B Materials

This work shall be in accordance to the pertinent provisions of standard spec 643.2.9 and as hereinafter provided.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Signs Left In Place as each sign, acceptably left in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0505	Traffic Control Signs Left In Place	Each

Payment is full compensation for furnishing, installing, and maintaining the Traffic Control Signs.

180. Traffic Control Detour Signs Left In Place, Item SPV.0060.0506.

A Description
This special provision describes furnishing, installing, and maintaining Traffic Control Detour Signs Left In Place as shown on the plans.

Traffic Control Detour Signs Left In Place becomes property of the department after final acceptance by the engineer.

B Materials
This work shall be in accordance to the pertinent provisions of standard spec 643.2.9 and as hereinafter provided.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Detour Signs Left In Place as each sign, acceptably left in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0506	Traffic Control Detour Signs Left In Place	Each

Payment is full compensation for furnishing, installing, and maintaining the Traffic Control Signs.

181. Crash Cushion Temporary Left In Place, Item SPV.0060.0507.

A Description
This special provision describes furnishing, installing, and maintaining Crash Cushion Temporary Left In Place as shown on the plans.

Crash Cushion Temporary Left In Place becomes property of the department after final acceptance by the engineer.

B Materials
This work shall be in accordance to the pertinent provisions of standard spec 614.2.7 and as hereinafter provided.

Use Model SCI 100GM Crash Attenuator from Smart Cushion Innovations (SCI) Products.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 614.3.4, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Crash Cushion Temporary Left In Place as each crash cushion, acceptably left in place.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0507	Crash Cushion Temporary Left In Place	Each

Payment is full compensation for providing, installing, and maintaining the Crash Cushion.

182. Surface Settlement Plates, Item SPV.0060.0800.

A Description
This special provision describes the work necessary to furnish and install geotechnical settlement plates; for maintenance of installed settlement plates; and taking initial and subsequent plate elevation readings; and leaving the settlement plates in place during all stages of construction. The contractor shall be responsible for monitoring ground movement as necessary to conform to the requirements of the contract. The instrumentation program specified herein and shown on the plans is not intended to be used to ensure the safety of the work.

A.1 Definitions
Open Ground
Ground without any above- or below-grade facilities, paved or unpaved roads, and utilities within a 25-foot horizontal radius.

Surface Settlement Plates
Settlement Plates are plates attached to rods installed in unpaved areas at predetermined locations to measure vertical (elevation) changes of the ground surface.

Fill
Fill is soil used to raise the grades in the planned location of the East to South and West to South ramps. The fill must be placed and compacted according to the QMP Subgrade special provision for the project.

Lightweight Foamed Concrete Fill (LFCF)
LFCF is concrete fill material used instead of soil fill in areas north of Station 575 ES to reduce the overburden pressure on underlying soils. The LFCF must be placed according to SPV.0035.4020 and SPV.0035.4030.

Surcharge Material
Surcharge material is waste soil from other parts of the project which will be used to induce settlement of the fill soil and LFCF between two construction stages for the East to South and West to South ramps. This soil will be placed on top of the fill soil or LFCF and removed at a later stage.

A.2 Personnel Qualifications
Surveyor licensed in Wisconsin with a minimum of 5 years experience in surveying monuments similar to those specified herein. The surveyor must be physically present at the installation sites to supervise the installations and to take initial settlement plate baseline readings.

A.3 Submittals
Submit the following specific information for information only, at least 15 days prior to the start of instrument installation:

1. Submit surveyor's state of Wisconsin registration information.
2. Drawing that indicates the locations of control points and benchmarks associated with surveys for monitoring geotechnical settlement plates. Drawing also needs to indicate planned settlement plate locations.
3. Description of methods for installing and protecting all settlement plates.
4. Schedule of settlement plate installation related to fill placement activities or milestones in the overall project.
5. Following installation of the settlement plates and prior to the start of fill placement, submit drawings showing the exact installed location, the instrument identification number, the installation date and time, and installed locations of control points and benchmarks associated with surveys for monitoring geotechnical settlement plates. Include details of installed settlement plates, accessories, and protective measures including all dimensions and materials used.

A.4 Review of Instrumentation Plan

Prior to ordering materials or installation of settlement plates, discuss with the engineer as to the suitability of the planned settlement plates and locations. The instrumentation plan specified herein and shown on the plans may be modified by the contractor prior to installation, to suit the contractor's means and methods of construction.

Replace, at no cost to the department, plates in place that become inaccessible or unreadable as a result of the contractor's means and methods of construction or changes in the contractor's means and methods of construction that could have been anticipated by the contractor prior to installation. The locations of replacement settlement plates shall be jointly determined by the engineer and contractor.

B Materials

B.1 Settlement Plates

Each settlement plate shall consist of 3/4 -inch black steel pipe attached via a coupling or union that is welded to a 2 foot by 2 foot by ¼-inch- thick steel plate. The steel pipe must be in 5-foot lengths. The total length of pipe per plate varies between 20 and 50 feet. The steel pipe will need to be added to as the fill height progresses over time, so the top of the steel pipe always extends above the soil fill, LFCF, and/or surcharge material.

B.2 Sleeve Casing

Riser pipe for sleeve casing shall consist of schedule 40 or thicker PVC pipe with glued couplings. All PVC pipe shall have a nominal diameter of 2 inches. The PVC pipe is required to prevent fill soil around the pipe from attaching to the pipe and resulting in erroneous settlement readings. In areas where LFCF is used, all PVC couplings must be water tight to prevent inflow of LFCF into the PVC pipe. The PVC pipe must be in maximum 5-foot lengths. The total length of PVC pipe per plate will vary between 20 and 50 feet. The PVC pipe will need to be added to as additional soil fill, LFCF, and/or surcharge material is placed.

C Construction

C.1 General

Notify the engineer at least 48 hours prior to all instrumentation installation operations so that the engineer may monitor the installation work. Provide the engineer and the department access to the settlement plates at all times.

C.2 Control Points

Reference surveys performed by the surveyor for monitoring geotechnical instrumentation to the same control points and benchmarks established for setting out the work. Settlement plate elevations must be determined to 1/100 of a foot. Tie control points to benchmarks and other monuments outside of the zone of ground movements that might result from underground excavations.

C.3 Tolerances
Install settlement plates within 5 feet of the horizontal locations indicated on the plans or approved shop drawings.

Obtain prior acceptance from the engineer for new instrument locations and elevations should actual field conditions prohibit installation at the locations and elevations indicated on the plans.

C.4 Execution
C.4.1 General
Install settlement plates at the locations indicated on the plans or approved drawings, and as approved by the engineer. Install settlement plates under the direct supervision of the contractor's surveyor and the engineer.

Locate conduits and underground utilities in all areas where settlement plates will be installed. Modify settlement plate locations, as approved by the engineer, to avoid interference with the existing conduits and utilities. Repair damage to existing utilities resulting from settlement plates installations at no additional cost to the department.

Install geotechnical settlement plates and complete baseline surveys/initial readings before commencing any fill placement work for the East to South and West to South ramp area. Settlement plate elevations must be determined to 1/100 of a foot.

Collect survey data from the settlement plates required by this article and provide to the engineer as specified herein.

C.5 Installation
C.5.1 General
Complete installation and initial survey of each settlement plate a minimum of 1 week prior to fill placement within 100 feet of the plate.

The anticipated general locations of settlement plates are shown on the plans. Mark locations of all plates in the field prior to installation acceptance of the location obtained from the engineer. Confer with the engineer in the event that conflicts with utilities occur, and changes to the planned locations become necessary.

Clearly mark, permanently label, and protect settlement plates to avoid being obstructed or otherwise damaged by construction operations or the general public. Mark sleeve casings.

After installation of each settlement plate, survey the as-built location to define the vertical and lateral positions of the plates in accordance to the requirements herein and furnish the engineer with a copy of the results within 72 hours of field data acquisition.

C.5.2 Installing Settlement Plates
Install settlement plates at the locations as shown on the plans. Settlement plates are to be set so as not to move relative to the surface to which it is placed. Place the settlement

plates on a firm and unyielding subgrade. Two of the settlement plates must be installed on the existing ground surface before placement of the fill soil/LFCF, while the other two are to be installed at the top of the LFCF before placement of the surcharge material. The required settlement plate identification numbers and locations of the plates are as shown below:

Surface Settlement Plate	Station	Approximate Elevation	Underlying Material
SP-1	579ES+00 Centerline of Roadway	792	LFCF
SP-2	578ES+75 Centerline of Roadway	780	Existing soil
SP-3	576ES+50 Centerline of Roadway	790	LFCF
SP-4	574ES+50 Centerline of Roadway	775	Existing soil

C.6 Protection

Flag and protect all locations. Exercise care during construction so as to avoid damage to plates. Repair or replace settlement plates that are damaged as a result of the contractor's operation at the contractor's expense. The engineer will determine whether repair or replacement is required. Complete the repair or replacement within one day after written notification by the engineer as to whether a repair or replacement is required.

C.6.1 Maintenance of Surface Settlement Plates

Maintain installed settlement plates to ensure their availability for use for the duration of the work which extends beyond this contract. At the completion of the job, leave all settlement plates in place for future use by another contractor. Surface Settlement Plates shall be painted with fluorescent orange paint prior to the contractor leaving the project for the last time.

C.7 Monitoring Settlement plates

Take all surveyor readings as specified in this article. Provide access to the plates as requested by the engineer. Make all survey data available to the engineer within 3 working days of reading. The elevations of the top of the black steel pipes that comprise the plates must be determined over time. Perform initial plate elevation survey at a minimum of 1 week prior to any placement of soil fill or LFCF within 100 feet of the plates. Additional plate surveys are required weekly for the first two months of monitoring and at least twice a month thereafter until the end of the filling or contract, whichever is longer. Survey the fill surface elevation at each settlement plate according to the same schedule as the settlement plates.

Add sections of black steel pipe and PVC sleeve pipe to the settlement plates as the fill placement proceeds. Survey the top elevation of the existing steel pipe immediately prior to adding another section of steel pipe and PVC pipe and calculate the increase in height and base plate elevation/settlement.

D Measurement
The department will measure Surface Settlement Plates as each individual unit, satisfactorily installed and surveyed over the course of the project as specified herein.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0800	Surface Settlement Plates	Each

Payment is full compensation for furnishing and installing each settlement plate, all materials, labor, tools and equipment necessary for providing submittals, furnishing materials, installation, protection, maintenance, replacement or repair of damaged settlement plates, replacement of inaccessible or unreadable plates, all survey readings, providing access to the engineer for reading, and all other specified items of work for which no separate bid item is provided.

183. LED Parking Lot Lighting Assembly, Item SPV.0060.0900.

A Description
This work consists of furnishing and installing luminaire, pole, arm, pole base and cover, and concrete base as shown on the plans, as part of Type A assembly, and as hereinafter provided.

B Materials
B.1 Light Fixture, Pole, and Concrete Base
All materials shall conform to the following Kim Lighting Part number for light fixture and pole as modified in this section and on the drawings.

Fixture shall be 1A-ET3P70-80L4K277-BL-P10-BL, and pole shall be KSS30-5180-A-BL.

C Construction
C.1 Light Fixture, Pole, and Concrete Base
All construction methods shall conform to all recommended factory installation requirements as well as standard spec 652.3, standard spec 655.3, standard spec 657.3, and standard spec 659.3.

D Measurement
The department will measure LED Parking Lot Lighting Assembly by the unit for each luminaire, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0900	LED Parking Lot Lighting Assembly	Each

Payment is full compensation for providing all materials including luminaire, pole, arm, pole base and cover, concrete base and all necessary hardware.

184. Removing Existing Floodlight Assembly, Item SPV.0060.0902.

A Description
The work under this item consists of removing lighting assembly consisting of luminaire as shown in the plan; removing associated underground conductors and removal of concrete base in accordance to the pertinent provision of the standard specifications and as hereinafter provided.

Components shall be transported or disposed of per the plans and specifications.

B (Vacant)

C Construction

Remove existing luminaire, luminaire wiring, concrete base, and associated underground conductors feeding lighting units being removed where indicated on the removal plans. Dispose of components off-site appropriately; recycle materials where possible.

Perform work in accordance to standard spec 652.3, standard spec 655.3, standard spec 657.3, and standard spec 659.3.

D Measurement
The department will measure Removing Existing Floodlight Assembly by the unit of each luminaire, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0902	Removing Existing Floodlight Assembly	Each

Payment is full compensation for removing and transportation of pole, arm, pole wiring and luminaire, the materials and appurtenances; and for removing related underground cable.

185. Relocating Existing Lighting Assembly, Item SPV.0060.0903.

A Description
The work under this item consists of removing lighting assembly consisting of pole, arm, pole wiring and luminaire as shown in the plan; removing associated underground conductors and removal of concrete base, storing the lighting assembly until site is ready

for reinstallation, repairing any blemishes on pole, cleaning and re-lamping light fixture, reinstalling the existing lighting assembly and providing and installing new concrete base in accordance to the pertinent provision of the standard specifications and as hereinafter provided.

Components shall be transported or disposed of per the plans and specifications.

B Materials

Use the luminaire, pole, arm, pole wiring mounting hardware and other existing lighting hardware salvaged from the site. Provide all other needed materials in conformance with standard spec 652.2, standard spec 655.2, standard spec 657.2, and standard spec 659.2.

C Construction

Remove the lighting unit per plan from its concrete base. Ensure that all access hand hole doors and all associated hardware and wiring remains intact. Store the lighting unit until the new concrete base is constructed and the site is ready for the lighting unit to be relocated.

Lighting unit components to be relocated:
Luminaire, pole, arm, pole wiring, and lighting hardware.

Remove associated underground conductors feeding lighting units being removed where indicated on the removal plans. Dispose of components off-site appropriately; recycle materials where possible.

Perform work in accordance to standard spec 652.3, standard spec 655.3, standard spec 657.3, and standard spec 659.3.

D Measurement

The department will measure Relocating Existing Lighting Assembly by the unit of each luminaire, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0903	Relocating Existing Lighting Assembly	Each

Payment is full compensation for relocating pole, arm, pole wiring and luminaire, providing and installing new concrete base, transportation, disposing of the materials and appurtenances, removing related underground cable.

186. Lamp Disposal High Intensity Discharge, Item SPV.0060.1010.

A Description

This special provision describes the packaging and delivering of high intensity discharge (mercury vapor, metal halide, and high-pressure sodium) lamps removed under this contract to the department for disposal as hazardous materials.

B Materials

Lamps turned in to the department will be considered the property of the department for proper future disposal, and the contractor will have no further obligation for their disposal.

C Construction

Pack intact lamps in the packaging of the new lamps used to replace them, or packaging affording the equivalent protection. Place in full, stackable cartons with the name of the contractor written on each carton. Segregate the lamps by type and wattage. Label each carton by the type and wattage contained (do not mix) and the quantity.

Pack broken lamps into thick plastic bags and place inside sturdy cardboard boxes or the equivalent. Mark the outer packaging with the term "broken lamps". Deliver all broken lamps to the department.

The department will not accept lamps improperly packaged or packed in metal containers. The department will reject any lamps not removed as part of this contract as shown on the plans.

Pile cartons no more than two high if palletized and secure them to prevent shifting or falling of the loads.

Deliver the lamps to the department at the South 60th Street office in West Allis. Consolidate all deliveries into a truckload or more, except when all the lamps removed under a contract measure less than a truckload, deliver as one load at one time. Contact Mike Prebish at (414) 266-1170, Monday through Thursday from 8:00 AM to 4:00 PM to set up an appointment for delivery.

D Measurement

The department will measure Lamp Disposal High Intensity Discharge as each individual unit delivered to the department properly packaged and delivered. The department will not measure broken lamps that exceed a total of ten percent of all lamps to be delivered.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1010	Lamp Disposal High Intensity Discharge.	Each

Payment is full compensation for handling, packaging, labeling and delivering the lamps.

Payment will be in addition to payment for the work under which the lamps are removed from service.

187. Relocating Light Poles Arms and Luminaires, Item SPV.0060.1019.

A Description
The work under this item shall consist of removing lighting pole, arm and luminaires from the locations shown in the plans, and reinstalling pole with arm and luminaire at a new location as shown in the plans, in accordance to the applicable provisions of standard specs 204, 655 and 659.

B (Vacant)

C Construction
Inspect the pole prior to removing from the existing base. Inform the engineer of any items of concern or potential problems that may interfere with the reuse of the pole, arm or luminaire. Minimize the time between removal from the existing base and reinstallation on the new base.

D Measurement
The department will measure Relocating Light Poles Arms and Luminaires by each individual light pole, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1019	Relocating Light Poles Arms and Luminaires	Each

Payment is full compensation for furnishing all the work required under this bid item.

188. Salvaging Light Poles and Arms - West Allis, Item SPV.0060.1020.

A Description
The work under this item to consist of removing lighting poles, arms, underground step down transformer (5Kv) and luminaires from the locations shown in the plans, and delivering the step down transformers and luminaires to the City of West Allis. Poles and arms will be reused on site. Lighting on 101st Street, Washington St. and Walker Street are part of 5KV series type lighting circuits.

B (Vacant)

C Construction
Inspect the pole prior to removing from the existing base. Inform the engineer of any items of concern or potential problems that may interfere with the potential reuse of the pole, arm or luminaire. Coordinate the delivery of the material to the City of West Allis with

Mr. Peter Daniels, (414) 302-8374. Coordinate with the city at least 2-weeks in advance of the intended delivery. Delivery will be within the City of West Allis. Delivery of salvaged material to be to the City of West Allis Department of Public Works yard at 6300 West McGeogh Avenue. Bases will be paid as a separate item and are not included herein.

D Measurement
The department will measure Salvaging Light Poles and Arms – West Allis by each individual light pole, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1020	Salvaging Light Poles and Arms – West Allis	Each

Payment is full compensation for furnishing all the work required under this bid item.

189. Salvaging Light Poles Arms and Luminaires - West Allis, Item SPV.0060.1021.

A Description
The work under this item to consist of removing lighting pole, arm, luminaires and 5KV buried stepdown transformers from the locations shown in the plans, and delivering the pole, arm(s) and luminaire(s) to the City of West Allis. Lighting on 100th Street and Schlingter Ave are part of 5KV series type lighting circuits.

B (Vacant)

C Construction
Lights on 100th St are powered from the "Q" distribution center on 104th St. Poles on Schlinger are powered from the "M" distribution center on S. 92nd Street. Coordinate with the City of West Allis.

Inspect the pole prior to removing from the existing base. Inform the engineer of any items of concern or potential problems that may interfere with the potential reuse of the pole, arm or luminaire. Coordinate the delivery of the material to the City of West Allis with Mr. Peter Daniels, (414) 302-8374. Coordinate with the city at least 2-weeks in advance of the intended delivery. Delivery will be within the City of West Allis. Delivery of salvaged material to be to the City of West Allis Department of Public Works yard at 6300 West McGeogh Avenue. Bases will be paid as a separate item and are not included herein.

D Measurement
The department will measure Salvaging Light Poles Luminaires and Arms – West Allis by each individual light pole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1021	Salvaging Light Poles Arms and Luminaires – West Allis	Each

Payment is full compensation for furnishing all the work required under this bid item.

190. Removing Aluminum Light Poles and Arms - Wauwatosa, Item SPV.0060.1031.

A Description

The work under this item shall consist of removing aluminum light poles and arms as shown on the plans. The luminaires shall be removed and turned over to the City of Wauwatosa. The concrete base removal will be under a separate bid item.

B (Vacant)

C Construction

Dispose of all materials offsite. Coordinate the delivery of the luminaire to the City of Wauwatosa with Mr. Bill Wehrley, (414) 479-8929.

D Measurement

The department will measure Removing Aluminum Light Poles and Arms as each individual pole and associated arms, acceptably removed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1031	Removing Aluminum Light Poles and Arms - Wauwatosa	Each

Payment is full compensation for furnishing all work and disposal of material.

191. Removing Concrete Light Poles and Arms - Wauwatosa, Item SPV.0060.1032.

A Description

The work under this item shall consists of removing concrete light poles and arms as shown on the plans. The luminaires shall be removed and turned over to the City of Wauwatosa. The concrete base removal will be under a separate bid item.

B (Vacant)

C Construction
Dispose of all materials offsite. Coordinate the delivery of the luminaire to the City of Wauwatosa with Mr. Bill Wehrley, (414) 479-8929. Backfill the resulting hole from the pole extraction with a suitable material for the location.

D Measurement
The department will measure Removing Concrete Light Poles and Arms as each individual pole and associated arms, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1032	Removing Concrete Light Poles and Arms - Wauwatosa	Each

Payment is full compensation for furnishing all work and disposal of material.

192. Removing Aluminum Light Poles, Arms and Luminaires, Item SPV.0060.1033.

A Description
The work under this item shall consists of removing aluminum light poles, arms and luminaires as shown on the plans. The concrete base removal will be under a separate bid item. The disposal of the lamps will be paid under a separate bid item Lamp Disposal High Intensity Discharge, SPV.0060.1010. Concrete bases are removed under a separate bid item 204.0195.

B (Vacant)

C Construction
Dispose of all materials offsite. Do not disable the lighting unit until the temporary lighting system over the area is operational.

D Measurement
The department will measure Removing Aluminum Light Poles, Arms, and Luminaires as each individual pole and associated arms, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1033	Removing Aluminum Light Poles, Arms and Luminaires	Each

Payment is full compensation for furnishing all work and disposal of material.

193. Wood Pole Lighting 60-Foot, Item SPV.0060.1035.

A Description

The work under these items include furnishing and installing 60-foot wood pole, arm(s) and floodlight(s), junction box, grounding system, and lightning protection system, as shown on the plans, in accordance to standard specs 651 and 659, and as hereinafter provided.

B Materials

Furnish wood poles, Class 4 or larger with a 60-foot minimum overall length. The poles shall be western red cedar in accordance to ANSI standards 05.1. Pressure treatment shall be 5% pentachlorophenol with a minimum of 8 pounds per cubic foot net retention of the oil-borne preservative. All poles shall be shaved the entire length.

Luminaire arm and luminaire for wood pole lighting units and temporary wood pole lighting units shall be per standard specs 657.2.3 and 659.2, respectively.

Floodlight mounting bracket arms for wood pole lighting units will be as shown on plan details. The floodlights are provided under separate bid items SPV.0060.1071.

C Construction

This work shall be done in accordance to the pertinent provisions of standard spec 611.3.1.1 and as shown on the plans. Install #4 AWG equipment grounding wire exothermically bonded to a 5/8 inch by 8 foot copper clad grounding electrode. Install cable guard, NEMA 3R junction box near mounting arm, and NEMA 4X junction box at 3 feet above grade for fuses and splice on wood pole units. Install air terminal with #2 AWG grounding wire exothermically bonded to a 5/8-inch by 8-foot copper clad grounding electrode for lightning protection. Install #2 AWG bare copper exothermically bonding between grounding electrodes. Install conduit and wiring between junction boxes, wire racks, and required hardware as necessary and as shown on lighting plans and detail drawings.

Install luminaire arm for wood pole lighting units as shown on the plans and details and as per applicable portion of standard specs 657.3 and 659.3.

D Measurement

The department will measure Wood Pole Lighting 60-Foot as a unit for each individual item, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1035	Wood Pole Lighting 60-Foot	Each

Payment is full compensation for furnishing and installing items as mentioned above; for furnishing all excavation and backfill.

194. Poles Wood 60-Foot, Item SPV.0060.1036.

A Description
Furnish and install wood poles and other incidental items as required and as shown on the plans, in accordance to standard spec 651, and as hereinafter provided.

B Materials
Furnish wood poles that are Class 4 or larger with a 60-foot minimum overall length. The poles shall be western red cedar in accordance to ANSI standards 05.1. All poles shall be shaved the entire length.

Wood poles used for freeway lighting shall be pressure treated with a 5 percent pentachlorophenol mixture with a minimum of 8 pounds per cubic foot net retention of the oil-borne preservative.

C Construction
Install the pole in accordance to the pertinent provisions of standard spec 611.3.1.1, and as shown on the plans. As necessary, install #4 AWG grounding wire exothermically bonded to a 5/8-inch by 8-foot copper clad grounding electrode, cable guard, NEMA 3R junction box 3ft above grade level for splice, and incidentals as necessary.

D Measurement
The department will measure Poles Wood 60-Foot as a unit for each individual pole, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1036	Poles Wood 60-Foot	Each

Payment is full compensation for furnishing and installing a wood pole; and for all excavation and backfill.

195. Poles Wood 35-Foot, Item SPV.0060.1037.

A Description
Furnish and install wood poles and other incidental items as required and as shown on the plans, in accordance to standard spec 651, and as hereinafter provided.

B Materials
Furnish wood poles that are Class 4 or larger with a 35-foot minimum overall length. The poles shall be western red cedar in accordance to ANSI standards 05.1. All poles shall be shaved the entire length.

Wood poles used for freeway lighting shall be pressure treated with a 5 percent pentachlorophenol mixture with a minimum of 8 pounds per cubic foot net retention of the oil-borne preservative.

C Construction

Install the pole in accordance to the pertinent provisions of standard spec 611.3.1.1, and as shown on the plans. As necessary, install #4 AWG grounding wire exothermically bonded to a 5/8-inch by 8-foot copper clad grounding electrode, cable guard, NEMA 3R junction box 3ft above grade level for splice, and incidentals as necessary.

D Measurement

The department will measure Poles Wood 35-Foot as a unit for each pole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1037	Poles Wood 35-Foot	Each

Payment is full compensation for furnishing and installing a wood pole; all excavation and backfill.

196. Moving Poles Wood 60-Foot and Floodlights, Item SPV.0060.1038.

A Description

The work under this item shall consist of removing 60-Foot wood pole, floodlights and aerial overhead cables from the locations shown in the plans, and reinstalling pole and floodlights at a new location as shown in the plans, in accordance to the applicable provisions of standard specs 204, 655 and 659.

B (Vacant)

C Construction

Remove aerial overhead cables and floodlights for reuse prior to removal/pull-out of the 60-foot wood pole from the early construction stage location. Minimize the time between removal from the existing location and reinstallation on the new construction stage location. Coordinate work with construction staging plans.

Remove existing poles and floodlights, transport and erect at new locations. This work includes mast arms, bracket arms and supports.

Remove aerial overhead cables, poles and floodlights without damaging them.

D Measurement
The department will measure Moving Ples Wood 60-Foot and Floodlights by each individual light pole, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1038	Moving Poles Wood 60-Foot and Floodlights	Each

Payment is full compensation for furnishing all the work required under this bid item including: excavation; backfilling; and for restoring the site. Separate payment will be made for aerial cable overhead material and installation.

197. Removing Poles Wood 60-Foot and Floodlights, Item SPV.0060.1040.

A Description
Remove 60-foot wood pole lighting units and attached conduit and wiring as shown on the plans and in accordance to standard spec 204, remove mast arm or bracket arm, luminaire, air terminal, and junction box, backfill openings or holes to the elevation of the surrounding ground, and landscape all disturbed areas from these removals.

B (Vacant)

C Construction
Dispose of all materials except lamps outside of right-of-way. Deliver the lamps to the department under a separate bid item, Lamp Disposal High Intensity Discharge.

The department will allow, at the contractor's discretion, to reuse removed wood pole lighting units at new locations, if possible. The bid price is to reflect the salvage value of the removed wood pole lighting unit. The department will allow, at the contractor's discretion, to reuse removed temporary wood pole lighting units at new locations, if possible.

D Measurement
The department will measure Removing Poles Wood 60-Foot and Floodlights by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1040	Removing Poles Wood 60-Foot and Floodlights	Each

Payment is full compensation for removing wood pole lighting units; all excavation and backfill; removal and disposal of material; and for restoring the site. Separate payment will be made for lamp disposal.

198. Removing Poles Wood 60-Foot, Item SPV.0060.1041.

A Description
This special provision describes removing 60-foot wood poles as shown on the plans.

B (Vacant)

C Construction
In addition to removing the attached conduit and wiring in accordance to standard spec 204, backfill all openings or holes to the elevation of the surrounding ground, and landscape all disturbed areas from these removals. Dispose of all materials outside of right-of-way.

D Measurement
The department will measure Removing Poles Wood 60-Foot as a unit for each pole, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1041	Removing Poles Wood 60-Foot	Each

Payment is full compensation for removing wood pole; all excavation and backfill; removal and disposal of material; and for restoring the site.

199. Pull Boxes Steel 24x42-Inch Grounded, Item SPV.0060.1051.

A Description
This special provision describes pull boxes similar to the standard pull box item of the same size, in accordance to standard spec 653, modified for Grounded Neutral wiring systems.

B Materials
Conform to materials requirements for standard pull box items in accordance to standard spec 653.

C Construction
Conform to construction requirements for standard pull box items in accordance to standard spec 653. In addition, drive a 5/8-inch x 8-foot copper grounding electrode at the bottom of the pull box. Bond the grounded neutral (“white”) conductors, and the canister, frame and cover grounds to the grounding electrode with #6 AWG and connect with an exothermic weld.

D Measurement
The department will measure Pull Boxes Steel 24x42-Inch Grounded according to standard spec 653.4.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1051	Pull Boxes Steel 24x42-Inch Grounded	Each

Payment is full compensation according to standard spec 653.5.

200. Junction Boxes 18x12x6-Inch Coated, Item SPV.0060.1056.

A Description
This special provision describes junction boxes in accordance to standard spec 653 and as hereinafter modified.

B Material
The material shall be in accordance to standard bid item 653.0222 and the qualified product list with the exception of the additional items. The unit shall include an epoxy powder coat, anti-corrosive or corrosion free coating for junction box and protective cover and a solid copper ground rod, with a stranded bare copper for equipment grounding electrode conductor.

C Construction
Drive a 5/8-inch x 8-foot copper grounding electrode adjacent to the junction box. Bond the equipment grounding conductor and the enclosure to the grounding electrode with #4 AWG and connect to the ground rod with an exothermic weld. The anti-corrosive coating shall be factory applied.

D Measurement
The department will measure Junction Boxes 18x12x6-Inch Coated according to standard spec 653.4.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1056	Junction Boxes 18x12x6-Inch Coated	Each

Payment is full compensation according to standard spec 653.5.

201. Luminaire Utility LED E, Item SPV.0060.1065.

A Description
This special provision describes furnishing and installing LED luminaires at the locations shown in the plan.

B Materials

B.1 Material Qualifications

Furnish a complete list of documentation in accordance to standard spec 651.2 and the following requirements. Be prepared to provide the following materials and/or data to the engineer and the City of West Allis Public Works, Peter Daniels, 7525 W Greenfield Avenue, West Allis, WI, (414) 302-3374, pdaniels@westalliswi.govt, for review and approval:

One example luminaire matching what is proposed for use on the project. Example luminaire shall be available for evaluation for up to two weeks time. Furnish the following list of specific documentation detailing the characteristics of the LED luminaire:

- Fixture IES files (.ies format) for illumination modeling
- Cut sheets, warranty information and parts list for all equipment.
- Luminaire heat dissipation techniques.
- Energy usage information.
- Color spectrum with HID lamp comparison.
- Optical design features.

Do not order materials until the engineer approves the list.

B.2 Luminaire

Furnish LED luminaires with a slim, low profile design that minimizes wind loading. Luminaires shall be constructed of rugged cast and extruded aluminum with integral, weather-tight LED driver components with high performance aluminum heat-sinks. Each luminaire shall use a terminal block for power input suitable for #2 to #14 AWG wire. Luminaire shall be IESNA Type II Medium distribution with a minimum of house side lighting. The luminaire shall designed to mount on a 2" IP (2.375" O.D.) horizontal tenon and shall be adjustable +/- 5 degrees to allow for leveling. Luminaire shall include a leveling bubble visible from the underside of the unit or the inside of the luminaire. Units are to be mounted on the arms salvaged from the lights currently on 101st Street.

B.2.1 Electronic Components

Luminaire shall accommodate varied lighting output from high brightness, 4000k to 4300K (+/- 500K per full unit), minimum 70 CRI, long life LED sources. Drivers shall operate across 120-277V, 50/60 Hertz as standard. LED drivers shall have a power factor greater than 90% and THD less than 20% of full load. All luminaires shall come equipped with an integral 2.5kV minimum surge suppression protection standard and a quick disconnect harness suitable for mate and break under load provided on power feed to driver for ease of maintenance.

B.2.2 Optical / Illumination Performance

Luminaire shall conform to the following:

- Luminaire tested and certified by an independent test laboratory to meet the photometric performance criteria established by IESNA LM-79.
- Luminaire shall be IESNA Type II Medium distribution.
- Luminaire shall deliver a minimum of 3,500 lumens and be rated to consume no more than 555 watts (+/- 15%) while operating for a minimum of 70,000 hours (+/- 10%).

B.2.3 Finish
The luminaire fixture finish shall feature an epoxy primer with an ultra-durable gray or silver powder topcoat, providing resistance to corrosion, ultraviolet degradation and abrasion. Alternative equivalent finishes shall be approved by the engineer.

B.2.4 Ratings / Certifications
Luminaires shall be rated and/or certified as follows:

- U.L. listed for wet locations
- RoHS compliant for lead and mercury standards
- IP-65 minimum weather fastness rating
- IDA dark sky full cutoff compliant

Acceptable LED luminaires are:

Cree LEDway model; STR-LWY-2MB-HT-03-E-UL-SV-525-40K-SC
American Electric Model:ATB0-30BLED53-MVOLT-R2-HS=NR
Philips Lumec Model: Miniview SVS-54W16LED4K-T-LE2-UNIV-HS-GY3

C Construction
Install LED Luminaire in accordance to the pertinent provisions of standard spec 659 and as the manufacturer directs.

D Measurement
The department will measure Luminaire Utility LED E as each individual LED luminaire, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1065	Luminaire Utility LED E	Each

Payment is full compensation for furnishing all materials; installing a complete luminaire; and for furnishing all documentation.

202. Luminaires Floodlight 1000W HPS, Item SPV.0060.1070.

A Description

The work under this item shall consists of furnishing and installing 1000 watt HPS floodlight luminaires with photoelectric control, in both a 240V and 480 Volt configuration depending on the lighting control cabinet suppling the power. Luminaires shall to be installed in accordance to standard spec 659.

B Materials

Appropriate 240V Floodlight Models include or approved equal:

American Electric Lighting, Model 77X1SRNMT266TMLC1023PCSS
Cooper Lighting, Model HPNKS1000LLOA/RA1016
Lithonia, Model TFA1000SRBTBFSC22PERLPI

Appropriate 480V Floodlight Models include or approved equal:

American Electric Lighting, Model 77X1SRN5T466TMLC1023PCSS
Cooper Lighting, Model HP-NKS-1000-480V-LL-OA/RA1027
Lithonia, Model TFA-1000S-RB-480FTS-C22-PE4-LPI

Units shall have a 6X6 or 7X7 light distribution. Units shall have a photoelectric cell for control of the fixture operation.

C Construction

The following lighting control cabinets will supply 240V power to flood lights for temporary lighting: HL-40-ZN (6 floods); HL-40-TA (2 Floods)

The following lighting control cabinets will supply 480V power to flood lights for temporary lighting: HL-40-LE; HL-40-WB; HL-40-AD; HL-40-DX.

The contractor shall install the luminaire on the light poles at locations specified in lighting plan and in accordance to standard specs 659.2.1 and 659.3.1, wired and fused in accordance to standard spec 659.3.2 and plan details. Luminaires shall be orientated (0 deg = North) as shown and at an angle of 45-degrees from the vertical

D Measurement

The department will measure Luminaires Floodlight 1000W HPS as each individual luminaire, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1070	Luminaires Floodlight 1000W HPS.	Each

Payment is full compensation for furnishing all the work and materials required under this bid item.

203. Luminaires Floodlight 400W HPS, Item SPV.0060.1071.

A Description

The work under this item shall consist of furnishing and installing 400 Watt HPS floodlight luminaires, with photoelectric control, in a 480 Volt configuration and in accordance to standard spec 659.

B Materials

Appropriate Floodlight Models include or approved equal:

GE Turnpike, General Elec. Product Number: RPFS-40S480V-M2GL-N3-GRK.
Holophane Predator, Holophane Product Number: PF-400HP-480V-BN1KR
Cooper Lighting, Model HP-NKS-400-480V-LL-OA/RA1027

Units shall have a 6x6 or 7x7 light distribution. Units shall have a photoelectric cell for control of the fixture operation.

C Construction

Install the luminaire on the light poles at locations specified in lighting plan in accordance to standard spec 659.2.1, and 659.3.1, and wired and fused in accordance to standard spec 659.3.2 of standard specifications and plan details. Luminaires shall be orientated (0 deg = North) as shown and at an angle of 45-degrees from the vertical. Units shall be suitable for mounting on the poles provided under bid item Poles Type A With Bullhorn Bracket.

D Measurement

The department will measure Luminaires Floodlight 400W HPS by each individual luminaire, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1071	Luminaires Floodlight 400W HPS	Each

Payment is full compensation for furnishing all the work and materials required under this bid item.

204. Luminaire (UDL) Wallpack LED, Item SPV.0060.1078.

A Description

This special provision describes furnishing and installing LED wallpacks at the locations shown in the plan.

B Materials

B.1 Material Qualifications

Furnish a complete list of documentation in accordance to standard spec 651.2 and the following requirements. Be prepared to provide the following materials and/or data to the engineer:

One example luminaire matching what is proposed for use on the project. Example luminaire shall be available for evaluation for up to two weeks time. Furnish the following list of specific documentation detailing the characteristics of the LED luminaire:

- Fixture IES files (.ies format) for illumination modeling
- Cut sheets, warranty information and parts list for all equipment.
- Luminaire heat dissipation techniques.
- Energy usage information.
- Color spectrum with HID lamp comparison.
- Optical design features.

Do not order materials until the engineer approves the list.

B.2 Luminaire

Furnish LED wallpacks. Luminaires shall be constructed of rugged cast aluminum with integral, weather-tight LED driver components Castings shall be sealed with a one-piece gasket.. Each luminaire shall use a terminal block for power input suitable for #2 to #14 AWG wire. Luminaire shall be IESNA Type IV distribution. The luminaire shall designed to mount on a flat surface. Unit shall be rated for an outdoor installation down to a -40 Deg C ambient temperature.

B.2.1 Electronic Components

Luminaire shall accommodate varied lighting output from high brightness, maximum 5000K (+/- 500K per full unit), long life LED sources. Drivers shall operate across 120-277V, 50/60 Hertz as standard. LED drivers shall have a power factor greater than 90% and THD less than 20% of full load.

B.2.2 Optical / Illumination Performance

Luminaire shall conform to the following:

- Luminaire tested and certified by an independent test laboratory to meet the photometric performance criteria established by IESNA LM-79.
- Luminaire shall be IESNA TypeIV distribution.
- Luminaire shall deliver between 6800and 7000 lumens and be rated to consume no more than 80 watts (+/- 15%) The LLF shall be 0.86 or better for a minimum of 100,000 hours (+/- 10%).
- Maximum nominal drive current of 530 Ma.
- Prismatic glass lens.

B.2.3 Finish

The luminaire fixture finish shall feature an epoxy primer with an ultra-durable silver powder topcoat, providing resistance to corrosion, ultraviolet degradation and abrasion. Alternative equivalent finishes shall be approved by the engineer.

B.2.4 Ratings / Certifications
Luminaires shall be rated and/or certified as follows:

- U.L. listed for wet locations
- RoHS compliant for lead and mercury standards
- IP-65 minimum weather fastness rating

C Construction
Install Luminaires (UDL) Wallpack LED in accordance to the pertinent provisions of standard spec 659 and as the manufacturer directs.

D Measurement
The department will measure Luminaire (UDL) Wallpack LED as each individual LED luminaire, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1078	Luminaire (UDL) Wallpack LED	Each

Payment is full compensation for furnishing all materials; installing a complete luminaire; for furnishing all documentation.

205. Salvage Distribution Centers, Item SPV.0060.1090.

A Description
The work under this item consists of removing distribution center from existing base at locations shown in the plans, and relocating it to a new base at location shown in plans, in accordance to standard specs 654 and 655. Concrete control cabinet base removal and installation will be measured and paid for under a separate bid items.

B Materials
Provide small parts, fittings, fasteners, connectors, splice kits, and other appurtenances that are needed to complete the installation and are approved by the engineer.

C Construction
Install and connect the distribution center as shown in the plans. Perform work to meet all applicable codes and conform to good electrical construction practices. The work shall include making all connections for a complete and operable lighting system.

Ground the chain link fence if shown in the plans and electrically bond the gates to the fence with flexible copper jumpers whenever fences are crossed by an underground utility high-voltage service lateral, whether existing or installed for this project.

Coordinate all necessary arrangements with the utility for removal of electrical service to old base and providing new secondary service at 240/480 VAC isolated neutral to new base on behalf of the State of Wisconsin, which will be the billing customer. The department will pay all required utility service extension fees. Minimize the time between removal from the existing base and reinstallation on the new base. Concrete base removal and installation will be paid for as a separate items and are not included herein. Work to include connections to power existing lights at the new location as shown in the plans. Provide temporary utility power or generators to maintain illumination on the highway during the transference between locations. Highway lighting shall be maintained during all nightly hours. .

D Measurement

The department will measure Salvage Distribution Centers by each individual relocation, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1090	Salvage Distribution Centers	Each

Payment is full compensation for removing, hauling, removing the original concrete base, temporary power and installing distribution cabinet; for making connections; for providing and installing all parts, fittings, fasteners, connectors, and splice kits, for fence grounding; for restoration of WE Energies rough backfill; and for coordination with the utility.

206. Lighting Control Cabinet 240/480 VAC, Item SPV.0060.1096.

A Description

The work under this item shall consist of furnishing and installing 100 Ampere 240/480 VAC lighting control cainets (distribution centers), as shown in the plans. To the extent possible, provide components from the same manufacturer. Conform to standard spec 651.2(4) regarding listed components. Electrical service, service entrance conductors, and concrete control cabinet base will be measured and paid separately. Two NEMA decals per installation, one for the meter pedestal and one for the cabinet door, to read DANGER 480 VOLTS, will each be paid as Plaques Sequence Identification.

B Materials

B.1 General

Furnish, deliver and install Lighting Control Cabinet 240/480 VAC from the department Qualified Product List to the project site. Notify the department lighting engineer, Mr. Eric Perea, (262) 750-0935, for approval before installation.

B.2 Contactors

The contactors shall be electrically held, specification grade, two-pole, with 30A contacts. Provide 1” high engraved plaque above each contactor indicating the circuit number in ½” text as appropriate.

B.3 Photocell
Provide photocell Receptacle to accommodate NEMA twist-lock photocell. Provide opening on side of housing to allow proper photocell operation.

B.4 HOA Switch
Provide a hand-off-auto switch that is accessible without opening dead-front door.

B.5 Panelboards
Provide a specification grade panelboard interior, Square D type NQ or equal. The panel shall be rated, sized, and configured as indicated on the attached drawings. Provide copper bus bars and copper ground and neutral bus bars. Provide thermal-magnetic circuit breakers that clearly indicate ON, OFF, or TRIPPED position in the panel.

Provide a separate or back-fed main circuit breaker.

B.6 Enclosures
The cabinet shall be of NEMA Type 3R rainproof construction and shall be UL listed as "Enclosed Industrial Control Equipment" (UL 508A). External construction shall comply with UL50 requirements. Cabinet dimensions shall be as indicated on the attached drawings.

Cabinet exterior shall be fabricated from 1/8" clear anodized 5052-H32aluminum.

All fasteners, latches and hardware shall be of stainless steel and all hinges shall be continuous piano type. No fasteners except sealing screws shall be removable by external access.

All edges and corners on both exterior and interior must be rounded and smooth to prevent injuries.

The distribution equipment compartment shall be behind an external lockable door with standard #2 key locking mechanism. A door keeper shall be provided to keep the door in the open position. Electrical equipment shall be located behind an internal dead-front door with a quarter turn securing latch and hinged to open a minimum of 120 degrees. The dead-front door shall be hinged on the same side as the customer door.

A metal print pocket shall be located on the inside of the customer door large enough to hold all circuit directories and instructions in a clear plastic 8"x10" weatherproof sleeve.

The cabinet mounting bolts shall not be externally accessible. Cabinet can be mounted to a concrete base with use of stainless steel anchors.

Cabinet shall be rated for operation at 22k minimum AIC amps interrupting. Series rating is acceptable.

All distribution and control equipment shall be factory wired using 600 volt wire.

Cabinet dimensions shall be as indicated on the attached drawings.

B.7 Field Wiring Termination Blocks
Provide quantity of channel mount NEMA rated, box lug, single terminal blocks as indicated on plans that are capable of holding #12 to #2 wire for power, neutral, and grounding connections. The terminal blocks shall be mounted on a mounting channel with end anchors and an end barrier. Each terminal block shall have a label indicating the appropriate circuit number, neutral ('N') or ground ('G') wire connected to block; handwritten numbers and letters are not acceptable means of identification.

B.8 Surge Protection Devices (SPD)
SPD for 240V or 240/480V Power: Install a Type 1 SPD on distribution panelboard on the load side of a dedicated 2-pole, 30A circuit breaker.

SPDs shall be UL Listed and labeled to UL 1449 Third Edition. SPDs shall be posted on VZCA at UL.com.

The following ratings shall not be exceeded on any mode of protection:

- Short Circuit Current Rating (SCCR): 200kA or the available short circuit current, whichever is greater
- Nominal Discharge Current Rating (In): 20kA
- Voltage Protection Rating (VPR): 700V
- Maximum Continuous Operating Voltage (MCOV): 150V
- Peak surge current rating: 50kA per phase (sum of L-N plus L-G)

SPD's SPDs shall include directly connected MOVs exceeding 32mm in diameter from L-N and either L-G, N-G, or both. SPD shall at a minimum be rated as NEMA 1.

The acceptable Lighting Control Cabinet Manufactures are as follows:

- Milbank Manufacturing
- Povolny Specialties
- State Manufacturing Corporation

B.9 240-120/240V Transformer and 120V Duplex Receptacle
Provide a NEMA 1, 3 KVA or larger step down transformer, a 20A 1 pole circuit breaker and duplex, GFI receptacle.

C Construction
Use a UL 508 Listed Panel Builder to assemble the lighting control cabinet. Assemble the lighting control cabinet with all of its electrical components, wiring and parts in a neat and orderly fashion and as shown on the plans. Pretest the cabinet prior to shipment to the site. Panel Builder shall apply UL label inside cabinet.

Mount all equipment to panel in enclosure. Train the cables in straight horizontal and vertical directions, and parallel next to, and adjacent to other cables whenever possible. Install wiring in slotted raceway between terminal strip, contactor and panelboard. Secure all remaining wiring using screw attachment type straps; adhesive type will not be allowed.

Surge arresters shall be installed to allow LED indicator(s) to be readily visible when viewing inside of cabinet. Connect the surge arresters as indicated on the plans.

D Measurement

The department will measure Lighting Control Cabinet 240/480 VAC as each individual, unit acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1096	Lighting Control Cabinet 240/480 VAC	Each

Payment is full compensation for furnishing and installing the lighting control cabinet.

207. Lighting Control Cabinet 480/277 VAC, Item SPV.0060.1100.

A Description

The work under this item shall consist of furnishing and installing 100 Ampere, 277/480 VAC, 3 phase lighting distribution centers, as shown in the plans. To the extent possible, provide components from the same manufacturer. Conform to standard spec 651.2(4) regarding listed components. Electrical service, service entrance conductors, and concrete control cabinet base will be measured and paid separately. Provide two NEMA decals reading DANGER 480 VOLTS per installation, one for the meter pedestal and one for the cabinet door. Provide an Arc-Flash Hazard Warning decal in accordance to Article 110.16 of NFPA 70. Decals are incidental to the lighting control cabinet.

B Materials

B.1 General

Furnish, deliver and install Lighting Control Cabinet 277/480 VAC. to the project site. Unit shall be similar to the 240/480VAC, 1 phase distribution cabinet as listed in the department Qualified Product List but with the following exceptions and as noted below:

1. Incoming power to be 480Y/277V, 3 phase, 100A
2. Utility meter to be 3 phase and of the model and type approved by WE-Energies.
3. Surge protection device to be 3 phase
4. Main breaker to be 100A/3Pole
5. Branch circuit breakers for lighting to be 30A/1Pole
6. Lighting contactors to be 3 pole with 277V coils
7. Step-down transformer to be 277V/120V
8. All lighting circuits to be 4-wire (L1,L2,L3,N) plus ground.

Notify the department lighting engineer, Mr. Eric Perea, (262) 548-5921, for approval before installation.

B.2 Contactors
The contactors shall be electrically held, specification grade, three-pole, with 30A contacts. Provide 1" high engraved plaque above each contactor indicating the circuit number in ½" text as appropriate.

B.3 Photocell
Provide photocell receptacle to accommodate NEMA twist-lock photocell. Provide openings on the side and back of housing to allow proper photocell operation. Cabinet door should open south.

B.4 HOA Switch
Provide a hand-off-auto switch that is accessible without opening dead-front door.

B.5 Panelboards
Provide a specification grade panelboard interior, Square D type NQ or equal. The panel shall be rated, sized, and configured as indicated on the attached drawings. Provide copper bus bars and copper ground and neutral bus bars. Provide thermal-magnetic circuit breakers that clearly indicate ON, OFF, or TRIPPED position in the panel.

Provide a separate or back-fed main circuit breaker.

B.6 Enclosures
The cabinet shall be of NEMA Type 3R rainproof construction and shall be UL listed as "Enclosed Industrial Control Equipment" (UL 508A). External construction shall comply with UL50 requirements. Cabinet dimensions shall be as indicated on the attached drawings.

Cabinet exterior shall be fabricated from 1/8" clear anodized 5052-H32aluminum.

All fasteners, latches and hardware shall be of stainless steel and all hinges shall be continuous piano type. No fasteners except sealing screws shall be removable by external access.

All edges and corners on both exterior and interior must be rounded and smooth to prevent injuries.

The distribution equipment compartment shall be behind an external lockable door with standard #2 key locking mechanism. A door keeper shall be provided to keep the door in the open position. Electrical equipment shall be located behind an internal dead-front door with a quarter turn securing latch and hinged to open a minimum of 120 degrees. The dead-front door shall be hinged on the same side as the customer door.

A metal print pocket shall be located on the inside of the customer door large enough to hold all circuit directories and instructions in a clear plastic 8”x10” weatherproof sleeve.

The cabinet mounting bolts shall not be externally accessible. Cabinet can be mounted to a concrete base with use of stainless steel anchors.

Cabinet shall be rated for operation at 22k minimum AIC amps interrupting. Series rating is acceptable.

All distribution and control equipment shall be factory wired using 600 volt wire.

Cabinet dimensions shall be as indicated on the attached drawings.

B.7 Field Wiring Termination Blocks
Provide quantity of channel mount NEMA rated, box lug, single terminal blocks as indicated on plans that are capable of holding #12 to #2 wire for power, neutral, and grounding connections. The terminal blocks shall be mounted on a mounting channel with end anchors and an end barrier. Each terminal block shall have a label indicating the appropriate circuit number, neutral (‘N’) or ground (‘G’) wire connected to block; handwritten numbers and letters are not acceptable means of identification.

B.8 Surge Protection Devices (SPD)
SPD for 277/480V 3-Phase Power: Install a Type 1 SPD on distribution panelboard on the load side of a dedicated 3-pole, 30A circuit breaker.

SPDs shall be UL Listed and labeled to UL 1449 Third Edition. SPDs shall be posted on VZCA at UL.com.

The following ratings shall not be exceeded on any mode of protection:

- Short Circuit Current Rating (SCCR): 200kA or the available short circuit current, whichever is greater
- Nominal Discharge Current Rating (In): 20kA
- Voltage Protection Rating (VPR): 700V
- Maximum Continuous Operating Voltage (MCOV): 150V
- Peak surge current rating: 50kA per phase (sum of L-N plus L-G)

SPDs shall include directly connected MOVs exceeding 32mm in diameter from L-N and either L-G, N-G, or both. SPD shall at a minimum be rated as NEMA 1.

The acceptable Lighting Control Cabinet Manufactures are as follows:

- Milbank Manufacturing
- Povolny Specialties
- State Manufacturing Corporation

B.9 Control Equipment

The stepdown transformer shall be 1.5KVA, single phase, 60Hz, encapsulated, NEMA 1 rated and UL listed. The primary voltage shall be 277V and secondary voltage shall be 120V with 5% tapping. The transformer shall be capable of mounting inside the cabinet.

SPST, 20 amp switch for the door shall be single pole single throw type heavy duty, temper resistant, rated for 125V, UL listed.

The incandescent lighting fixture shall be enclosed, gasketed and wet location rated with 60Watt, 120V lamp, UL listed.

Control breaker shall be 15 amp, single pole 120V, bolt on, UL listed. The circuit breaker shall have 10K AIR rating at 120V, terminal for minimum wire size 14 AWG and maximum wire size 8 AWG.

B.10 Color Coding of Wiring Within the Enclosure

The color coding within the panel shall be:

480V-	L1	Brown
	L2	Orange
	L3	Yellow
	N	Gray
	Gnd	Green or bare
120V-	L1	Black
	N	White
	Gnd	Green or Bare

C Construction

Use a UL 508 Listed Panel Builder to assemble the lighting control cabinet. Assemble the lighting control cabinet with all of its electrical components, wiring and parts in a neat and orderly fashion and as shown on the plans. Pretest the cabinet prior to shipment to the site. Panel Builder shall apply UL label inside cabinet.

Mount all equipment to panel in enclosure. Train the cables in straight horizontal and vertical directions, and parallel next to, and adjacent to other cables whenever possible. Install wiring in slotted raceway between terminal strip, contactor and panelboard. Secure all remaining wiring using screw attachment type straps; adhesive type will not be allowed.

Surge arresters shall be installed to allow LED indicator(s) to be readily visible when viewing inside of cabinet. Connect the surge arresters as indicated on the plans.

Minimum size wiring within panel to be #12 AWG or as required based upon the overcurrent protection.

D Measurement
The department will measure Lighting Control Cabinet 480/277 VAC as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1100	Lighting Control Cabinet 480/277 VAC	Each

Payment is full compensation for furnishing and installing the lighting control cabinet.

208. Concrete Control Cabinet Bases Special, Item SPV.0060.1101.

A Description
This special provision describes furnishing and installing concrete control cabinet bases special, as shown in the plans. These bases are for lighting control cabinets operating at 480/277 VAC, 3 phase.

B Materials
Materials shall conform to pertinent requirements of standard spec 654.2.

C Construction
Construction shall conform to pertinent requirement of standard spec 654.3. The concrete base size shall be as shown on the plans. Coordinate with the respective panel.

D Measurement
The department will measure Concrete Control Cabinet Bases Special, by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1101	Concrete Control Cabinet Bases Special	Each

Payment is full compensation according to standard spec 654.5(2).

209. Poles Aluminum Type F, Item SPV.0060.1130.

A Description
The work under this item consists of furnishing and installing 50-foot nominal height light poles type F at locations specified in plans, in accordance to plan details, the applicable portions of standard spec 657, and as hereinafter provided. Pole design shall fall within the parameters shown in the plans and as enumerated below; and certified by vendor to support the required loads. The department will measure and pay for mast arms and luminaires as a separate item of work.

B Materials
Certify the drawings as conforming to these requirements. Drawings to be signed and sealed by a registered professional engineer in either Wisconsin or the state in which the structures are to be fabricated. Design to withstand 100 MPH wind with a 1.3 gust factor.

C Construction
The completed lighting unit shall be erected with the shaft vertical and the arms at a 3% rise, under load.

Conform to the requirements for high mast design calculations and shop drawings, standard spec 660.3.1, to the extent that such requirements also apply to the work under this item.

D Measurement
The department will measure Poles Aluminum Type F by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1130	Poles Aluminum Type F	Each

Payment is full compensation for furnishing, wiring, and installation of the pole and all attachments less mast arms and luminaires.

210. Concrete Bases Type B, Item SPV.0060.1131.

A Description
The work under this item consists of furnishing and installing concrete base type B at locations specified in plans, in accordance to plan details, the applicable portions of standard spec 654, and as hereinafter provided. Concrete base design shall fall within the parameters shown in the plans and as enumerated below; and certified by vendor to support the required loads.

B (Vacant)

C Construction
The detail of construction with the exceptions of height above grade and conduit size shall be as defined in standard detail for Type 8 base.

D Measurement
The department will measure Concrete Bases Type B by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1131	Concrete Bases Type B	Each

Payment is full compensation according to standard spec 654.5.

211. Concrete Bases Type 5L, Item SPV.0060.1132.

A Description
The work under this item consists of furnishing and installing concrete bases type 5L at locations specified in plans, in accordance to plan details, the applicable portions of standard spec 654, and as hereinafter provided. Concrete base design shall fall within the parameters shown in the plans and as enumerated below; and certified by vendor to support the required loads.

B (Vacant)

C Construction
The detail of construction with the exceptions of the height which is 5 feet longer or deeper than the standard detail for Type 5 base and conduit size shall be as defined in standard detail for Type 5 base. The steel reinforcing shall also extend the extra 5 feet. Anchor bolts to remain the same as a Type 5 base. The quantities of concrete, hoop bar steel and vertical are approximately twice that of a standard type 5 base.

D Measurement
The department will measure Concrete Bases Type 5L by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1132	Concrete Bases Type 5L	Each

Payment is full compensation according to standard spec 654.5.

212. Electrical Service Meter Breaker Pedestal Temporary Lighting, Item SPV.0060.1152.

A Description
This work shall consist of furnishing and installing an electrical service for the temporary lighting as shown on the plans and as follows.

Provide a 60 amp, 120/240 volt, single phase, underground electrical service lateral, furnished and installed by the local utility. The service lateral shall terminate at a meter socket located in a meter pedestal as detailed.

The contractor shall arrange for the electrical power source in the name of WisDOT. The engineer shall be notified when the system is ready for connection to the power mains. The contractor shall pay for the Utility service installation. WisDOT will pay for energy costs.

B Materials

The contractor shall furnish and install an approved meter pedestal, conduit fittings, and connection (s) and all necessary conductors and equipment required by the State Electrical Code and the utility for a service connection

Utility grade materials as shown on the plans are required. The meter pedestal and support materials shall be in accordance to the latest edition of the WE Energies Electric Service and Metering Manual.

When required by the local utility, a manual bypass meter socket may be required.

Provide NEMA 4, watertight enclosures for fused switches mounted outdoors or wherever the subscript WP is indicated on the Plans. Provide fused switches that can be locked in the OFF position. Interlock enclosures to prevent opening the cover with the switch in the ON position. Provide fused switches which are quick-make, quick-break, motor-rated, load-break, heavy-duty (HD) type having external marking clearly indicating ON and OFF positions. Provide fuses of the current ratings indicated and types specified herein. Utilize fuse mountings that reject Class H fuses and will accept only the current-limiting fuses specified. Install fused switches meeting the requirements of UL and NEMA KS-1 and being suitable for application.

Provide a NEMA 4X, 4 pole stainless steel lighting contactor with 30A rated contacts. Unit to have an integral photo eye and a keyed HAND/OFF/AUTO selector switch.

C Construction

The contractor shall install the electrical service in accordance to local utility requirements. The contractor shall furnish the utility with a wiring affidavit, certifying that the service has been installed in accordance to the State of Wisconsin electrical code.

The contractor shall be responsible for coordinating the timely installation of the service lateral by the utility.

Splices shall be made at the distribution centers, in junction boxes and at pole bases only, unless otherwise approved by the engineer. Wire runs shall be continuous between the locations approved for splices.

Damp location splices may be made with Scotchlock or equivalent wire nuts for three #6 AWG wires or smaller or two #4 AWG wires or smaller. Split bolt or crimp splices will be accepted for the above application and are required for larger combinations of wires. Split bolt or crimp splices made in damp locations shall be made for each conductor and shall be appropriately sized. Split-bolt or crimp splices shall be made without irregularities or voids around the fitting and shall be built up with 3M "2200" vinyl mastic pad or approved equal, covered with an approved vinyl insulating tape, and finished with an outer layer of electrical varnish. Damp locations include pole bases, well-drained junction boxes, vented cabinets, approved condulets, and luminaire housings.

Wet location splices shall be made with an approved epoxy insulation kit. Wet locations include direct earth burial, pull boxes, and junction boxes where there is not good drainage.

Mount the fused disconnect switches in a straight and plumb manner. Provide a wooden overall enclosure for the fused disconnect switches to limit access by the public. The enclosure should be neat, square and plumb. Enclosure shall be made of marine plywood and provided with a green enamel coat of paint.

D Measurement

The department will measure Electrical Service Meter Breaker Pedestal Temporary Lighting by the service completed and energized and all fused disconnect switches, raceway and wiring complete.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1152	Electrical Service Meter Breaker Pedestal Temporary Lighting	Each

Payment is full compensation for providing the excavation, backfill, conduit, fittings, metering pedestal and meter socket, anchoring, concrete, inspection and incidentals necessary to complete.

213. Removing Electrical Service Meter Breaker Pedestal Lighting, Item SPV.0060.1153.

A Description

This special provision describes removing an existing electrical service meter breaker pedestal, supports and any additional electrical equipment associated with the service including disconnect switches and overall enclosure, disconnecting all connected power wires, and disposing of the equipment appropriately.

B (Vacant)

C Construction
Coordinate for removal of the existing electrical service meter breaker pedestal with WE Energies.

Disconnect all connected power wires, remove the pedestal, include existing electrical service meter breaker, supports and disconnect switches if present and dispose of all materials properly away from the project area.

D Measurement
The department will measure Removing Electrical Service Meter Breaker Pedestal Lighting by each individual unit, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1153	Removing Electrical Service Meter Breaker Pedestal Lighting	Each

Payment is full compensation for coordination with WE Energies; for disconnection of wires; for removal of the pedestal and any additional material of the service.

214. Ground Rod, Item SPV.0060.2001.

A Description
This special provision describes installing a ground rod and ground wire.

B Materials
Ground rod shall be copper clad steel with cladding 13 mils thick. The minimum diameter is 5/8-inch and the minimum length is eight feet. Ground wire shall be AWG # 6 bare, solid copper.

C Construction
Use exothermic welding to connect the ground wire to the rod. Install the rod vertically, or as close to vertical as conditions permit. Select locations with moist soil, if available. Place the rod at least six feet from all other ground rods.

D Measurement
The department will measure Ground Rod by the unit, acceptably installed.

E Payment
The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2001	Ground Rod	Each

Payment is full compensation for installation of the ground rod and ground wire; welding and connections at both ends of the ground wire.

215. Removing Ramp Control Signal Assembly Sidemount, Item SPV.0060.2002.

A Description

This special provision describes removing an existing sidemount ramp control signal assembly.

B Materials

Materials included in sidemount ramp control signal assemblies are:

1. Traffic signal standards.
2. Pedestal bases for traffic signal use.
3. Vehicular traffic signal heads.
4. Signal mounting brackets.
5. Sign mounting brackets.
6. Enforcement signal displays.

C Construction

Remove sidemount ramp control signal assemblies at the locations shown in the plans, or as directed by the engineer. Salvage the signal assemblies for the department to pick up, or dispose of them properly as directed by the engineer.

All work shall be in accordance to the applicable requirements of standard specs 655, 656, 657, and 658, the Wisconsin Electrical Code, these special provisions, and the details shown in the plans.

Salvage and store all removed materials for pickup by the department. Coordinate with the engineer on a schedule to have the removed items picked up. Maintain all materials in a condition suitable for reutilization. Replace all items damaged during construction operations.

Electrical work under this item shall be completed by a journeyman electrician or be completed under the supervision of a journeyman electrician. Legal status or standing as a journeyman electrician shall be certified or otherwise documented to the engineer before any electrical work may begin.

D Measurement

The department will measure Removing Ramp Control Signal Assembly Sidemount by the unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2002	Removing Ramp Control Signal Assembly Sidemount	Each

Payment is full compensation for removal and storage of the ramp control signal assembly; disconnecting all wiring connections; removing all conduit connections; and for any necessary restoration, including backfill, topsoil, and seeding.

216. Removing Controller Cabinet, Item SPV.0060.2003.

A Description

This special provision describes removing an existing controller cabinet.

B (Vacant)

C Construction

Remove controller cabinets at the locations shown on the plans, or as directed by the engineer. Salvage and store the cabinets and all contents for pick up by the department.

Do not remove the existing ITS control cabinets, or any other associated equipment until necessary, or as directed by the engineer. Carefully remove the existing cabinets from the concrete bases, together with all components in such a manner as to safeguard all parts and wiring from damage or loss. Salvage and store the cabinet and contents for pick up by the department.

Prior to removing the existing ITS control cabinets, remove all cables being terminated in the cabinet. Cut existing cables flush with cabinet base and cap existing conduits. Dispose of the cables properly away from the project area.

D Measurement

The department will measure Removing Controller Cabinet by the unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2003	Removing Controller Cabinet	Each

Payment is full compensation for removal and storage of the controller cabinet; disconnecting all associated wires and cables; and for capping existing conduits.

217. Removing Controller Cabinet Base, Item SPV.0060.2004.

A Description

This special provision describes removing an existing controller cabinet concrete base.

B Materials
Existing controller cabinet base, including concrete masonry, ground rods, masonry anchors, and restoration materials such as topsoil, seeding, mulch, and fertilizer in accordance to the pertinent provisions of standard specs 201, 625, 627, 629, 630, 636, and 640.

C Construction
Remove and dispose of the concrete foundation and all other pertinent materials, and restore the disturbed area by placing 4-inches of topsoil, and fertilize, seed, and mulch all disturbed areas in accordance to the pertinent requirements of the standard specifications.

D Measurement
The department will measure Removing Controller Cabinet Base by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2004	Removing Controller Cabinet Base	Each

Payment is full compensation for removing and disposing of a concrete controller cabinet base, including masonry anchors, ground rods, and concrete masonry; for topsoil, fertilizer, seed and mulch.

218. Removing Controller Ramp Meter Processor Assembly, Item SPV.0060.2005.

A Description
This special provision describes removing existing controller ramp meter processor assembly at locations shown on the plan including all materials needed, rewiring and/or disconnect of wiring in the cabinet and return of removed equipment to WisDOT.

B Materials
Materials include existing ITS cabinets and existing 170 ramp meter processor assemblies.

C Construction
Make all the proper disconnects and wiring changes in the controller cabinet.

Remove the existing controller ramp meter processor assembly as the plans show. Use caution not to damage any existing devices or processor assembly.

The department will pick up the controller ramp meter processor assembly. Contact Kurt Wilm, (414) 940-5570, Wisconsin Department of Transportation, Statewide Traffic Operations Center. Dispose of the cabling and wiring properly away from the project site.

D Measurement
The department will measure Remove Controller Ramp Meter Processor Assembly as each individual unit, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2005	Remove Controller Ramp Meter Processor Assembly	Each

Payment is full compensation for removing an existing controller ramp meter processor assembly; for disconnecting all necessary cables and wiring; and properly storing the materials.

219. Removing Electrical Service Meter Breaker Pedestal, Item SPV.0060.2006.

A Description
This special provision describes removing an existing electrical service meter breaker pedestal, disconnecting all connected power wires, and disposing of the equipment appropriately.

B Materials
Existing electrical service meter breaker pedestal.

C Construction
Coordinate for removal of the existing electrical service meter breaker pedestal with WE Energies.

Disconnect all connected power wires, remove the pedestal and dispose of all materials properly outside of right-of-way.

D Measurement
The department will measure Removing Electrical Service Meter Breaker Pedestal by each individual unit, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2006	Removing Electrical Service Meter Breaker Pedestal	Each

Payment is full compensation for coordination with WE Energies; for disconnection of wires; for removal and disposal of the pedestal.

220. Removing Communications Vault, Item SPV.0060.2007.

A Description

This special provision describes removing an existing communications vault.

B Materials

Materials include existing communications vault and restoration materials such as backfill, topsoil, seeding, mulch, and fertilizer in accordance to the pertinent provisions of standard specs 201, 625, 627, 629, 630, 636, and 640.

C Construction

Disconnect and cap conduit entering the communications vault. Remove and dispose of the communications vault. Backfill with material similar to the material surrounding the removal and restore the disturbed area by placing 4-inches of topsoil, and fertilize, seed, and mulch all disturbed areas in accordance to the pertinent requirements of the standard specifications.

It is acceptable to re-use the vault lid in instances where new communications vaults are being installed in the project and the existing lid is undamaged. It is the contractor's responsibility to determine if the existing vault lids fit on the proposed vaults.

D Measurement

The department will measure Removing Communications Vault by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2007	Removing Communications Vault	Each

Payment is full compensation for removing and disposing of a communications vault; and for backfill, topsoil, fertilizer, seed and mulch.

221. Removing Overhead Freeway DMS, Item SPV.0060.2008.

A Description

This special provision describes removing an existing full-matrix overhead freeway dynamic message sign, controller, and cables; removing the sign and controller; storing them for removal of desired parts by the department, and disposing of remaining undesired parts.

B Materials

Existing sign, controller, control cables, and power wires.

Existing sign assembly consists of dynamic message sign, hardware for mounting sign on sign structure, and sign controller. Cabling for the dynamic message sign and controller is contained in rigid conduit. The above components are mounted to an overhead freeway DMS structure.

Removed dynamic message sign will be a Mark IV Industries LTD. 18-Inch Light Emitting Diode (LED), Full Matrix, Type 1 sign. The nominal dimensions of the sign are 310-Inches long, 106-Inches high, 36-Inches wide at the bottom and 42-Inches wide at the top.

C Construction

Carefully remove the dynamic message sign and controller for storage, parts removal, and later disposal. Prior to removing the sign and controller, the contractor may request that it be inspected to determine condition. Once removal has started, the contractor shall be responsible for any damage to the sign or controller. It will be the choice of the contractor on how best to remove the sign from the overhead structure. Replace or repair any damaged components at no additional expense to the department.

Store the dynamic message sign and controller in a secure and safe location until such time as the department can have a representative remove desired parts from the sign. The department will complete the parts removal process within 10 non-holiday business days of the sign being removed from the overhead structure and access being granted to the department representative. Contact Dean Beekman at (414) 227-2154 for coordination of parts removal by the department 30 days prior to the sign being made available for parts removal. After the department has obtained all desired parts from the sign, the contractor shall properly dispose of all remaining undesired parts off of the project area. Remaining undesired parts will include the DMS enclosure.

D Measurement

The department will measure Removing Overhead Freeway DMS by each individual unit, acceptably removed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2008	Removing Overhead Freeway DMS	Each

Payment is full compensation for removing the DMS, sign controller and cables, including any necessary wiring disconnections; for storing the sign for spare parts removal; any necessary restoration; for disposing of the sign enclosure and remaining components after spare parts removal.

222. Removing Microwave Detector Assembly, Item SPV.0060.2009.

A Description

This special provision describes removing an existing Microwave Detector Assembly.

B Materials
Materials included in Microwave Detector Assembly are:

1. Microwave Detector.
2. Type 5 Pole.
3. Transformer Base.
4. Mounting Hardware.

C Construction
Remove Microwave Detector Assembly at the locations shown in the plans, or as directed by the engineer. Salvage the Microwave Detector Assemblies for the department to pick up, or dispose of them properly as directed by the engineer.

All work shall be in accordance to the applicable requirements of standard specs 655, 656, 657, and 658, the Wisconsin Electrical Code, these special provisions, and the details shown in the plans.

Salvage and store all removed materials for pickup by the department. Coordinate with the engineer on a schedule to have the removed items picked up. Maintain all materials in a condition suitable for reutilization. Replace all items damaged during construction operations.

Electrical work under this item shall be completed by a journeyman electrician or be completed under the supervision of a journeyman electrician. Legal status or standing as a journeyman electrician shall be certified or otherwise documented to the engineer before any electrical work may begin.

D Measurement
The department will measure Removing Microwave Detector Assembly by each individual unit, acceptably removed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2009	Removing Microwave Detector Assembly	Each

Payment is full compensation for removal and storage of the Microwave Detector Assembly; disconnecting all wiring connections; removing all conduit connections; for any necessary restoration, including backfill, topsoil, and seeding.

223. Install Portable Video Surveillance System, Item SPV.0060.2010.

A Description
This special provision describes deploying a portable trailer-mounted video surveillance system as shown in the plans to provide continuous video surveillance of the project area during permanent CCTV sites downtime.

B Materials
Materials will be state-furnished and will be an all inclusive unit consisting of a cable erected pole with a direct IP CCTV camera, a solar power system, a wireless Ethernet bridge, and stability outriggers, all mounted on a trailer.

C Construction
Pick up the state-furnished video surveillance system at the department facility at 531 W. Newhall Ave, Waukesha, WI.

Deploy the surveillance system in the initial location as shown on the plans and as directed by the engineer following all recommended procedures by the manufacturer.

Integrate the surveillance system with the new and existing communications system through the wireless Ethernet bridge. Installation of the backhaul end of the wireless Ethernet bridge will be compensated for with other pay items in this contract.

D Measurement
The department will measure Install Portable Video Surveillance System as a unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2010	Install Portable Video Surveillance System	Each

Payment is full compensation for picking up the surveillance system in Waukesha; for deploying it in the project area; for making functional, and for testing.

224. Relocating Portable Video Surveillance System, Item SPV.0060.2011.

A Description
This special provision describes moving a previously deployed portable video surveillance system to a new location as directed by the engineer or as made necessary by construction operations in the area.

B Materials
Portable video surveillance system and wireless Ethernet bridge previously deployed through other pay items in this contract.

C Construction
Coordinate all planned down-time of the portable video surveillance system with the STOC at (414) 227-2166. Notify the STOC an amount of time ahead of planned down-time equal to the planned down-time. Examples would be that a 4-hour temporary down-time of the system would require notification 4-hours ahead of time while an 8-hour planned down-time would require 8-hours of advance notification.

Per manufacturer's recommendations, prepare the surveillance system for towing, relocate to the new location, re-deploy, and make functional as directed by the engineer and as made necessary by construction operations.

No payment will be made for this work unless previously approved by the engineer. No payment will be made for this work for relocations made necessary by operations not previously planned with the engineer's approval.

D Measurement
The department will measure Relocating State-Furnished Portable Video Surveillance System by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2011	Relocating Portable Video Surveillance System	Each

Payment is full compensation for taking the surveillance system down, moving to a new location, and re-deploying in a new location; for re-integrating the wireless Ethernet bridge into the communications system.

225. Installing Temporary Vehicle Detector Assembly, Item SPV.0060.2012.

A Description
This special provision describes assembling from a combination of state-furnished and contractor furnished materials a temporary vehicle detector assembly and installing, calibrating, and integrating the assembly into the existing system.

B Materials
Materials will include state-furnished materials and contractor furnished materials.

State-furnished materials include the following:

- One Electronic Integrated Systems, Inc. (EIS) Remote Traffic Microwave Sensor (RTMS) with integral 900 MHz serial radio.
- One solar power system consisting of 2-85W panels, 2-120 Amp-Hour batteries, a solar power controller, and one solar power cabinet to house the batteries and controller.
- Contractor furnished materials include the following:
- One 30-foot type 4 or larger wood pole. The wood pole shall be western red cedar in accordance to ANSI standards 05.1. Pressure treatment shall be 5% pentachlorophenol with a minimum of 8 pounds per cubic foot net retention of the oil-borne preservative. Pole shall be shaved the entire length.
- Outdoor rated Power cable between solar power system output and state-furnished RTMS.
- Mounting hardware for solar power system and RTMS detector.

C Construction

RTMS Detector Installation:
Install the wood pole according to industry standards for supplied pole length.

Install the RTMS detector as required in standard spec 675. Additionally, integrate the integral serial communications radio with the radio installed at the field cabinet end. Installation of field cabinet radio is covered with other pay items in this contract.

Solar Power System Installation:
Install the solar panels facing south on the pole with the devices to be powered. If a compass is used, a correction must be made for the difference between magnetic north and true north. Install the solar panels at a tilt angle of approximately 60 degrees. The tilt angle shall be considered the angle from horizontal to the front, or face of the solar panel.

Mount the cabinet to the pole by the two cast aluminum mounting brackets which are already attached to the back of the cabinet. The brackets shall be attached to the pole using stainless steel bands or U-bolts.

Install the cabling, ensuring that cables enter the cabinet only through the bottom, and that strain relief fittings are used to seal cable entrance points. Connect the panel to the charge controller, connecting the white wire to the positive (+) terminal and the black wire to the negative terminal (-).

D Measurement

The department will measure Installing Temporary Vehicle Detector Assembly as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2012	Installing Temporary Vehicle Detector Assembly	Each

Payment is full compensation for providing the contractor furnished materials, assembling the state-furnished and contractor furnished materials, installing the assembly, calibrating the detector, and making the assembly functional.

226. Refocusing Temporary Vehicle Detector Assembly, Item SPV.0060.2013.

A Description

This special provision describes refocusing an existing microwave detector for operation with a new lane configuration when relocation of the Temporary Vehicle Detector Assembly (TVDA) pole is not required.

B Materials

Materials include the following items purchased and installed in other contracts:

- One Electronic Integrated Systems, Inc. (EIS) Remote Traffic Microwave Sensor (RTMS) with integral 900 MHz serial radio.
- Mounting hardware for solar power system and RTMS detector.

C Construction

Coordinate all planned down-time of the temporary vehicle detector assembly with the STOC at (414) 227-2166. Notify the STOC an amount of time ahead of planned down-time equal to the planned down-time. Examples would be that a 4-hour temporary down-time of the system would require notification 4-hours ahead of time while an 8-hour planned down-time would require 8-hours of advance notification.

Verify to the satisfaction of the engineer that the existing detector assembly is working properly. Inspect the vehicle detector assembly for damage.

Reinstall the RTMS detector as required in standard spec 675. Additionally, integrate the integral serial communications radio with the radio installed at the base-Station field cabinet, and return the TVDA to operation.

D Measurement

The department will measure Refocusing Temporary Vehicle Detector Assembly by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2013	Refocusing Temporary Vehicle Detector Assembly	Each

Payment is full compensation for making the detector fully operational with a new lane configuration.

227. Remove Communications Hub Building, Item SPV.0060.2014.

A Description
This special provision describes removing an existing communications hub building.

B Materials
The significant components in the existing communications hub building include the following:

- Nominal 13 feet(W) X 9 feet(D) X 10 feet(H) precast concrete modular construction style building
- Four 19-inch equipment racks
- One 2-1/2 Ton Air Conditioning Unit
- One 200A, 42 space electrical load center
- One 100A generator receptacle
- One 200A manual transfer switch
- One 10-lb dry chemical fire extinguisher
- One 5-lb ABC rated fire extinguisher
- One 120VAC ionization smoke detector
- One ventilation system thermostatic controller
- One high temperature alarm
- One exterior 10A 120VAC GFI receptacle
- Eight 20A 120VAC interior receptacles
- One 66 dry terminal alarm block
- One plunger type door alarm
- One 4 foot X 4 foot telco termination board
- One thermostat

Shipped weight of the communications hub was approximately 30,000 pounds.

C Construction
Prior to initiating work regarding removing existing communications hub building, contact the STOC to confirm that all desired equipment has been removed.

Removal of existing individual communications equipment components will be paid for separately. Once existing individual communications equipment components have all been removed, any communications cable remaining in the hub building may be disregarded and cut and disposed of properly.

Upon deactivation of the communications hub building by removal of existing communications equipment, disconnect power conductors and coordinate with WE-Energies for disconnection and deactivation of service.

Once power is deactivated, exact details of disassembly may be determined by the contractor.

D Measurement
The department will measure Remove Communications Hub Building by each individual unit, acceptably removed.

E Payment

The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2014	Remove Communications Hub Building	Each

Payment is full compensation for disconnection of cabling; disconnection of power conductors; coordination with WE-Energies for deactivation of power service.

228. Remove Communications Hub Building Foundation, Item SPV.0060.2015.

A Description

This special provision describes removing the existing communications hub building underground foundation.

B Materials

The existing communications hub building underground foundation consists of four 36-inch diameter, 4-foot columns of concrete with reinforcing steel.

C Construction

After deactivating and disassembling the communications hub building, paid for separately, remove the underground foundation consisting of four concrete and reinforcing steel columns.

D Measurement

The department will measure Remove Communications Hub Building Foundation by each individual unit, acceptably removed.

E Payment

The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2015	Remove Communications Hub Building Foundation	Each

Payment is full compensation for breaking down; for removing; for hauling and disposing of materials; unless backfilled through other project processes, for granular backfill for backfilling.

229. Removing Electronic Blank Out Sign Assembly, Item SPV.0060.2016.

A Description

This special provision describes removing a small electronic blank out message sign and associated supporting wood posts.

B Materials
Existing electronic blank out message sign and wood posts.

C Construction
Disconnect the power conductors for the blank out sign at the associated cabinet.

Remove the existing sign and dispose of it appropriately off the project site.

Remove the existing wood posts and dispose of appropriately off the project site.

D Measurement
The department will measure Removing Electronic Blank Out Sign Assembly as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2016	Removing Electronic Blank Out Sign Assembly	Each

Payment is full compensation for removing and disposing of an electronic blank out message sign and wood posts.

230. Install 5.8 GHz Ethernet Bridge, Item SPV.0060.2017.

A Description
This special provision describes installing a state-furnished, or salvaged, 5.8 GHz Ethernet bridge access point or subscriber unit at a new or existing cabinet or new or existing pole.

B Materials
Materials will include state-furnished materials and contractor furnished materials.

State-furnished or salvaged, materials include the following:

- One 5.8 GHz Ethernet bridge with integral antenna.
- One 5.8 GHz Ethernet bridge power converter.
- One 5.8 GHz Ethernet bridge mounting bracket.

Contractor-furnished materials include the following:

- Mounting hardware.
- Outdoor rated Category 6 communications cable.
- Inline network cable surge suppressor.

C Construction
Bond the surge suppressor to the cabinet grounding system.

Install the 5.8 GHz Ethernet bridge in a point-to-point or point-to-multipoint configuration as shown on the plans and as directed by the engineer.

Use the manufacturer's set-up software to configure the Ethernet bridge radio for its intended use. Use the signal strength indicator on the radio to find the optimum position. Also perform a frequency analysis to determine the optimal hop pattern of the radios and test the continuity of the link by polling the radios using the software provided. The position of the radio and the hop pattern shall be adjusted until the polls show at least 200 consecutive polling intervals have been successfully transmitted and received. Demonstrate to the engineer that the hop pattern selected corresponds to the optimal noise free frequencies identified in the frequency analysis. Deliver 3 copies of the final test results for signal strength, frequency analysis, and test polling.

D Measurement
The department will measure Install 5.8 GHz Ethernet Bridge as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2017	Install 5.8 GHz Ethernet Bridge	Each

Payment is full compensation for installing, setting up, configuring, and testing the 5.8 GHz Ethernet bridge radio, surge suppressor, cables, and connections; and transportation.

231. Removing On-Ramp Closure Gate, Item SPV.0060.2018.

A Description
This special provision describes removing and salvaging an existing on-ramp closure gate, delivering salvaged material to the department and disposing of materials appropriately off the project site.

B Materials
Existing pole, transformer base, concrete base, gate arm, winch assembly, LED flashers, wiring, and other components of the existing on-ramp closure gate assembly.

C Construction
Prior to beginning work on removing the on-ramp closure gate, turn off the power to the gate at the adjacent cabinet that supplies the power, and disconnect the power conductors.

Once the power has been turned off and the conductors disconnected, it is the contractor's decision regarding whether to remove the gate arm, winch, and other hardware from the pole prior to removal, or to remove as one assembly.

Salvage and store all removed materials until delivered to the department. Coordinate with Bill Wondrachek, (262) 548-5669, on a schedule and location to have the removed items delivered. Maintain all materials in a condition suitable for reutilization. Replace all items damaged during construction operations.

Once the above ground portions of the on-ramp closure gate assembly are removed, remove the below ground concrete base and dispose of all materials appropriately off the project site.

D Measurement
The department will measure Removing On-Ramp Closure Gate as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2018	Removing On-Ramp Closure Gate	Each

Payment is full compensation for disconnecting any necessary wiring; removing the poles and equipment mounted on the poles and delivering to the department; and for removing the concrete base; and for disposal of surplus material.

232. Install Fiber Optic Media Converter, Item SPV.0060.2019.

A Description
This special provision describes installing a multi-mode to single-mode fiber optic media converter, and providing all necessary associated wiring.

B Materials
The department will furnish the fiber optic media converter. Provide all necessary cables between media converter and associated device.

C Construction
Install the media converter in a new or existing field cabinet. Connect it to devices as shown on the plans, or as directed by the engineer.

D Measurement
The department will measure Install Fiber Optic Media Converter by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2019	Install Fiber Optic Media Converter	Each

Payment is full compensation for installing a fiber optic media converter; furnishing all necessary incidental hardware; and making all necessary connections; and for testing.

233. Installing Conduit Into Existing Manhole, Item SPV.0060.2020.

A Description

This special provision describes locating existing conduit system manholes and installing new conduit into those manholes at the locations shown on the plans. The contractor shall verify existing conduit manhole locations with the City of Milwaukee, and shall maintain any existing conductors, fibers, and conduit paths without interruption or damage. Repair and restoration of all disturbed areas resulting from the work shall be in accordance to the pertinent provisions of the standard specifications, and as hereinafter provided.

B Materials

Conduit, as provided and paid for under other items in this contract. All materials shall conform to the pertinent provisions of the standard specifications unless otherwise noted.

C Construction

Carefully expose the outside of the existing structure without disturbing any existing conduits or cabling.

Drill the appropriate sized hole for the entering conduit at a location within the structure that will not disturb the existing cabling and will not hinder the installation of new cabling within the installed conduit, or remove existing abandoned conduit from the structure to allow for the installation of the new conduits as indicated on the plans.

Fill any void area between the drilled hole and conduit with an engineer-approved filling material to protect against conduit movement and entry of fill material into the structure.

Carefully tamp backfill into place.

All disturbed areas shall be repaired and restored in kind.

D Measurement

The department will measure Installing Conduit Into Existing Item by the unit, acceptably installed. Up to six conduits entering a structure per entry point into the existing structure will be considered a single unit. Conduits in excess of six, or conduits entering at significantly different entry points into the existing manhole will constitute multiple units.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2020	Installing Conduit Into Existing Manhole	Each

Payment is full compensation for drilling holes; removing abandoned conduit; furnishing and installing all materials, including bricks, and coarse aggregate; for excavation, bedding and backfilling, including any sand or other required materials; furnishing and placing topsoil, fertilizer, seed, and mulch in disturbed areas; for disposal of surplus materials; and for making inspections.

234. 4’ Diameter Manhole Type TES, Item SPV.0060.2021.

A Description

The work under this item consists of a 4’-0” round manhole for the City of Milwaukee Underground Conduit Section at locations shown in the plans, in accordance to standard specs 301, 611 and 501, and as hereinafter provided.

B Materials

Concrete and steel reinforcement shall conform to ASTM specification: C478 (latest edition), except that the single cage circumferential reinforcement in all vertical walls shall consist of lines of #6 steel wire spaced 3” horizontally and lines of #10 steel wire spaced 8” vertically located in the center of the wall.

Two lifting inserts for 1-1/2” diameter lifting eyes shall be cast in the wall of the base and all other riser sections except the top cap section.

Up to four 7/8” diameter galvanized steel 1-11/16” pulling-in eyes shall be cast in the wall of the base section directly across from each duct entrance.

Four 5/8” diameter plastic threaded cable rack bolt inserts shall be cast in the wall of the riser section.

A continuous circumferential Butyl Rubber gasket shall be supplied, to be laid on the wall joint of the base and riser section when manhole is being assembled at job site.

The number of pulling-in eyes and/or cable rack bolt inserts may vary.

Additionally, the size, location, shape and number of duct entrances and/or knock-out area may vary. Unit price of manhole shall not vary for number of openings, pulling-in eyes and/or rack bolt inserts.

The city will supply a frame and lid for the manhole. Contractor shall contact Mr. Ricardo Lopez, Inventory Clerk at (414) 286-6123 prior to obtaining the frame and lid from the DPW Headquarters at 3850 N. 35th Street. Contractor must have the “Casting Requisition Form” which shall be supplied by the city at the Preconstruction Meeting.

For any questions on materials, contact Ms. Karen Rogney at (414) 286-3243.

C Construction

4’ Diameter Manholes Type TES shall be installed in accordance to standard spec 611.3.

D Measurement
The department will measure 4’ Diameter Manhole Type TES by each individual manhole, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2021	4’ Diameter Manhole Type TES	Each

Payment is full compensation for furnishing all excavation work and disposal of material; for, furnishing and installing all materials, including bricks, and coarse aggregate, bedding and backfilling, concrete forms, concrete placement, appurtenances, and backfilling.

235. Adjusting TES Manhole, Item SPV.0060.2022.

A Description
This special provision describes adjusting the existing chimney of the block, precast, or brick round manholes; furnishing, installing and removing protection of the cables in the manhole during adjustment operations. Perform work in accordance to the standard specifications, the provisions of the article Adjusting Manhole Covers, as shown on the plans, and as hereinafter specified.

B Material
Furnish and install materials that conform to the requirements of standard spec 519. Salvage and reinstall existing covers on the manholes. The city will supply covers designated for replacement. Contractor shall contact Ricardo Lopez, Inventory Clerk at (414) 286-6123 prior to obtaining the frames and lids from the DPW Field Headquarters at 3850 N. 35th Street. Contractor must have the “Castings Requisitions Form” which shall be supplied by the city at the Preconstruction Meeting to obtain the covers.

C Construction
Report any pre-existing problems to Ms. Karen Rogney of City Underground Conduits Section at (414) 286-3243 3 working days in advance of any construction on manholes.

Before removing the pavement around the manhole, the contractor shall place a ¾-inch plywood cover or equal over existing active Street Lighting, Traffic Control, Communication or private vendor electrical cables. This cover shall be properly supported to/at the manhole floor.

Break out and remove pavement around manhole. Remove existing covers and store and secure them properly. Any damaged, lost, or stolen covers shall be the responsibility of the contractor and shall be replaced at contractor’s expense.

Remove existing chimney to surface of concrete roof slab. If manhole does not have an existing concrete roof slab, remove sufficient chimney as to provide adequate corbel to fit new cast iron frame and cover.

Adjust manhole cover to proposed grade using bricks or concrete rings as necessary. Remove wedges/shims. Fill voids with grout. Do not back plaster inside walls.

After completion of paving, remove the temporary ¾-inch plywood cover or equal which is over the existing electrical cables in the manhole as mentioned above.

Notify Ms. Rogney 3 working days in advance of completion of each manhole adjustment, for inspection and acceptance of work performed. The contractor will receive no payment until the above work is approved by City Underground Conduits.

D Measurement
The department will measure Adjusting TES Manhole by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2022	Adjusting TES Manhole	Each

Payment is full compensation for furnishing all required materials, exclusive of frames, grates, or lids available and designated for adjusting; and for removing, reinstalling and adjusting the covers. Covers to be adjusted and which are rendered unfit for use by the contractor through the contractor's operations will be replaced by the contractor in kind at the contractor's own cost and expense.

236. 4' Diameter "Doghouse" Manhole Type TES, Item SPV.0060.2023.

A Description
The work under this item consists of a 4'-0" round "doghouse" manhole for the City of Milwaukee Underground Conduit Section at locations shown in the plans, in accordance to standard specs 301, 611 and 501, and as hereinafter provided. This work includes providing and placing PVC pipe and associated fittings, cement encasement, and other appurtenances to extend existing conduit as required to provide a complete and fully functional communications manhole unit.

B Materials
1. Manhole. Concrete and steel reinforcement shall conform to ASTM specification: C478 (latest edition), except that the single cage circumferential reinforcement in all vertical walls shall consist of lines of #6 steel wire spaced 3" horizontally, lines of #10 steel wire spaced 8" vertically located in the center of the wall, and #6 rebar hoop centered in the wall 3" above the window knock-outs.

Two lifting inserts for 1-1/2" diameter lifting eyes shall be cast in the wall of the base and all other riser sections except the top cap section.

Up to four 7/8" diameter galvanized steel 1-11/16" pulling-in eyes shall be cast in the wall of the base section. Pulling-in eyes to be located across from all proposed duct entrances.

Four 5/8" diameter plastic threaded cable rack bolt inserts shall be cast in the wall of the riser section.

A continuous circumferential Butyl Rubber gasket shall be supplied, to be laid on the wall joint of the base and riser section when manhole is being assembled at job site.

The number of pulling-in eyes and/or cable rack bolt inserts ordered may vary.

Size, location, shape, and number of duct entrances may vary. Unit price of manhole shall not vary for number of openings, pulling-in eyes or cable rack inserts.

Field verify window depth and locations prior to ordering manhole.

The city will supply a frame and lid for the manhole. Contractor shall contact Mr. Ricardo Lopez, Inventory Clerk at (414) 286-6123 prior to obtaining the frame and lid from the DPW Headquarters at 3850 N. 35th Street. Contractor must have the "Casting Requisition Form" which shall be supplied by the city at the Preconstruction Meeting.

2. Conduit. The contractor shall furnish DB-60 polyvinyl chloride (PVC) conduit.

PVC conduit and fittings shall conform to the requirements of Standard Specifications for Smooth-Wall Poly (Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation, ASTM Designation: F512 (latest edition).

3. Concrete. The type of concrete to be used to encase the ducts will be:

Class of Concrete	Type of Cement	Min. Cement Content Sacks per Cubic Yard	Sizes of Coarse Aggregate
G-1	Standard Portland Cement Type 1A or 1SA	6.0	Sharp Torpedo Sand only

4. Slurry Backfill. Aggregate slurry backfill consists of No. 1 concrete aggregate Class 'C' concrete mix with the cement deleted.

Fly Ash (Class C)	75 lbs.
Concrete Sand (Damp)	1830 lbs.
No. 1 Concrete Aggregate	1830 lbs.

The material shall be mixed with water to inundate the aggregate sufficiently to provide an approximate 3 inch slump. The mix shall be deposited in the trench directly from a concrete transit mix truck.

For any questions on materials, contact Ms. Karen Rogney at (414) 286-3243.

C Construction

1. Manhole. Manhole Type TES "Doghouse" shall be installed in accordance to standard spec 611.3. The manhole is to be installed within the excavation limits of the manhole that had been removed. The bottom section of the manhole shall be installed while avoiding damage to the live active cables. The excavation may need to be widened to slide the bottom under the existing cables. After the bottom section of the manhole has been set, the existing cables need to be placed with the window openings, splice cases and/or coils placed back into the manhole.

Extreme care must be exercised in the handling of working cables within the excavation. When cables need to be moved, particularly lead sheathed cables, move cables slowly and gradually. Avoid sharp kinks that may damage the inner core of the cables and the sheath.

The contractor shall complete the "doghouse" manhole installation without any damage or service disruption to the existing cables.

2. Placing Duct. All ducts shall be inspected before placing to see that the bores are clean and free from mud, sand, etc. Only ducts with a smooth bore, free from burrs, rough projections etc. shall be used. Where burrs or other rough areas likely to damage cable are found in the duct, they shall be smoothed off by rasping or scraping.

All existing ducts shall be extended into the new manhole structure unless otherwise noted on the plan. Split PVC duct should be used on ducts containing cables. The split duct shall be installed per manufactures recommendations using tape and reinforced with plastic straps to produce a rigid, stable unit

All ducts shall terminate on the inside wall of the manhole. A standard end bell fitting shall be installed on all duct access points into the manhole.

Where trace wires are present, reconnect and extend trace with #10 copper wire extended two feet past the inside wall of the manhole.

3. Concreting. After conduit has been laid and the trench and duct have been inspected, concreting is to begin. The minimum concrete encasement of the ducts shall be 3 inches on the top, 2 inches on the sides, and 3 inches on the bottom (as shown on the detail). After placing, the concrete shall be puddled with a splicing bar or similar tool so that complete duct encasement is accomplished. Wood braces used to keep the conduit from floating shall be removed before the concrete sets completely and the resultant encasement voids filled with concrete.

Concrete encasement shall be allowed sufficient time to set before backfilling is commenced.

4. Slurry Backfill. The backfilling of the conduit shall commence immediately after the duct has been inspected, approved and has had sufficient time to set to withstand the load.

An aggregate slurry as specified shall be used to backfill all concrete encased conduit. The trench shall be slurry backfilled to the proposed or existing subgrade. The mix shall be deposited in the trench directly from a concrete transit mix truck.

D Measurement
The department will measure 4' Diameter "Doghouse" Manhole Type TES by each individual manhole, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2023	4' Diameter "Doghouse" Manhole Type TES	Each

Payment is full compensation for furnishing and installing all materials, including precast structure, bricks, conduit, conduit bodies, conduit fittings, trace wire, coarse aggregate, bedding, encasement, and backfilling including any concrete, stone, aggregate slurry, bracing, concrete forms, concrete placement, appurtenances, and backfilling.

237. Install Cabinet Heater and Thermostat, Item SPV.0060.2030.

A Description
This special provision describes installing department-furnished cabinet heater and thermostat as shown on the plans and as hereinafter provided.

B Materials
The units will consist of cabinet heater and thermostat. Provide stainless steel bolts and any other mounting or wiring hardware not furnished by the department.

C Construction
Install the cabinet heater in the lower part of the cabinet as shown on the plans.

Connect the cabinet heater to the AC power supply and place the thermostat in the upper part of the cabinet as shown on the plans.

D Measurement
The department will measure Install Cabinet Heater and Thermostat as each individual assembly, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2030	Install Cabinet Heater and Thermostat	Each

Payment is full compensation for installing all materials, including heater and thermostat and connections; for furnishing and installing mounting hardware; and for testing.

238. Install Wavetronix Click 200 Module, Item SPV.0060.2031.

A Description

This special provision describes installing department furnished Wavetronix Click 200 Module as shown on the plans and as hereinafter provided.

B Materials

The unit will consist of a Wavetronix Click 200 Module, DIN racks, terminal block, and wiring. Provide stainless steel bolts and any other mounting or wiring hardware not furnished by the department.

C Construction

Install the Wavetronix Click 200 Module in the cabinet on to the DIN rail as shown on the plans. Maintain good physical contact between the DIN rail and the cabinet to assure proper grounding.

Connect the Wavetronix Click 200 Module to the Wavetronix Power Module and to the Wavetronix unit as shown on the plan.

After the Wavetronix Click 200 Module is installed and the Wavetronix cable is connected to the Wavetronix units, test to see that all of the traffic lanes are being collected correctly.

D Measurement

The department will measure Install Wavetronix Click 200 Module as each Wavetronix Click 200 Module, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2031	Install Wavetronix Click 200 Module	Each

Payment is full compensation for installing Wavetronix Click 200 Module, making all necessary connections; for furnishing and installing mast brackets and mounting hardware; and for testing.

239. Install Wavetronix Power Module, Item SPV.0060.2032.

A Description
This special provisions describes installing department furnished Wavetronix power module (Click 202).

B Materials
The units will consist of Wavetronix power module, DIN racks, terminal block, and wiring. Provide stainless steel bolts and any other mounting or wiring hardware not furnished by the department.

C Construction
Install and test the charge regulator in the enclosure. Make the necessary electric connections between the components of the Wavetronix power module.

D Measurement
The department will measure Install Wavetronix Power Module as each individual assembly, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2032	Install Wavetronix Power Module	Each

Payment is full compensation for installing the Wavetronix power module and module rack in cabinet; for making all connections; for furnishing all programming; and for furnishing all testing.

240. Install Wavetronix Detector Module, Item SPV.0060.2033.

A Description
This special provision describes installing and testing a department-furnished Wavetronix Detector (HD 125) Module and HD 125 Cable as shown on the plans and as hereinafter provided.

B Materials
The department will provide the Wavetronix Detector (HD 125) Module and HD 125 Cable.

C Construction
Make all Wavetronix detector cables connections to the field cabinet and Wavetronix detector (HD 125) module to provide the required operation.

If any work proceeds at a location without completion of testing procedures, the contractor is responsible for the ultimate correct operation of the module and cables. The cost of correcting the Wavetronix Detector (HD 125) detector and cables shall be borne entirely by the contractor.

Demonstrate the functionality and accuracy of the vehicle detectors connected to each location. The traffic flow information obtained from each detector shall be within +/- 5% of each of two 10-minute manual data periods.

Successfully conduct a field test via the FTMS Field System Integrator for each Wavetronix Detector (HD 125) Module, complete with connections. The test is designed to demonstrate that Wavetronix Detector (HD 125) Module integrated by the contractor operates correctly, and that all functions are in conformance with these Specifications.

Following successful completion of the above tests, activate the Wavetronix Detector (HD 125) Module and leave on for 30 consecutive days. During this period, operate all materials and components of the Wavetronix Detector (HD 125) Module as specified and without any failure.

In the event that any component of the Wavetronix Detector (HD 125) Module malfunctions or operates below the level specified, the test period will be terminated, and the FTMS Field System Integrator will determine the problem and report the findings to the engineer. Upon correction of the problems, to the satisfaction of the engineer, a new 30- day test period will be started. In the event a malfunction is the result of equipment not installed by the contractor (e.g., power service), the acceptance test period will be suspended until correction of these problems by others.

Submit copies of the test results via the FTMS Field System Integrator, including any unsuccessful and subsequently successful tests to the engineer prior to any field operations testing.

D Measurement

The department will pay for Install Wavetronix Detector Module and HD 125 Cable as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2033	Install Wavetronix Detector Module	Each

Payment is full compensation for installing the Wavetronix Detector (HD 125) Module and HD 125 Cable; for making all connections; and for furnishing all testing.

241. Install Cellular Antenna, Item SPV.0060.2034.

A Description

This special provision describes installing State Furnished Cellular Antennas as shown on the plans and as hereinafter provided.

B Materials

The State will provide Cellular/Nextel/PCS Dual Band antennas. The following antennas are included:

Yagi Antennas with 10 dB Gain

All mounting material shall be stainless steel. Holes or notches shall not be drilled into a sign structure or pole. The sign structure or pole shall not be altered in any way.

C Construction

Install the antennas on poles by means of a mast bracket as shown on the plans. Provide the mast bracket of a diameter and construction as recommended by the antenna manufacturer, and approved by the engineer. Electrical and physically bond the mast bracket to the pole. The bracket shall maintain good physical contact with the pole to assure proper grounding.

Place the antenna in the direction indicated on the plan and Communication Schematic to ensure 100% data transfer.

Connect the antenna drop cable to the antenna. The connection shall be fully sealed with waterproof antenna sealant type compound.

After the antenna is installed on the pole, and the antenna cable is connected from the antenna to the assembly, test the signal for data transfer and signal strength. The data transfer shall be at 100%, and the signal strength shall be 60 or better.

D Measurement

The department will measure Install Cellular Antenna, as each cellular antenna is acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2034	Install Cellular Antenna	Each

The payment is full compensation for installing antenna and making all necessary connections; for furnishing and installing mast brackets and mounting hardware; and for testing.

242. Wireless Traffic Sensor, Item SPV.0060.2040.

A Description

This special provision describes furnishing and installing flush-mount wireless sensors in pavement to detect monitor vehicles.

B Materials

For the wireless sensor, use device that mounts flush to pavement, 16 frequency channels available, with 128 Hz sampling rate, auto-calibration, and 2-way radio communications. Integrate the wireless sensor node with the access point box and repeater device.

C Construction

Install contractor-furnished wireless sensors at locations the plans show.

Core or drill hole in pavement and vacuum or brush the hole clear of dust and debris.

Apply epoxy to the bottom of the hole to a depth approximately 1/3 of hole's total depth.

Install sensor in pavement at least 4" (10 cm) in diameter and 2 ¼" (5.7 cm) deep using a hammer or core drill.

Fill the hole with epoxy, completely covering the sensor and its shell.

Take every precaution to ensure that the sensor node is not damaged during storage or installation.

The contractor or field system integrator shall furnish all equipment, appliances, and labor necessary to test the installed sensor node.

Make all communications connections between the wireless sensor mode, access point and repeater, as required to provide a fully operational detection system.

After the wireless sensor node has been installed, and all other sensor equipment has been installed, the ATMS field system integrator shall successfully perform a field test at the sensor location to verify the sensor is detecting vehicles and accurately relaying the information to the access point.

Furnish all test equipment.

Following successful completion of the test, activate the entire detection system and leave it on for 30 consecutive days. During this period, ensure that all materials and components of the sensor system furnished and installed operate as specified and without any failure.

In the event that any contractor-provided component of the sensor system malfunctions or operates below the level specified, the department will terminate the test period, and will require the ATMS field system integrator to determine and correct the problems, including

repair or replacement of equipment, at no cost to the department. Upon correction of the problems, the engineer will start a new 30-day test period. If a malfunction is the result of equipment not installed by the contractor, the engineer will suspend the acceptance test period until the responsible party corrects these problems.

D Measurement
The department will measure Wireless Traffic Sensor as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2040	Wireless Traffic Sensor	Each

Payment for Wireless Traffic Sensor is full compensation for installing all materials, necessary to completely install the sensor node; and for installing identification plaques when required.

243. Wireless Traffic Sensor Access Point, Item SPV.0060.2041.

A Description
This section describes furnishing and installing wireless traffic sensor access points, and outdoor rated Ethernet cable between the access point and the respective controller cabinet, on poles or other structures to maintain wireless communications to all sensors and repeaters assigned to it and relay the data to a roadside traffic controller or remote server.

B Materials
The contractor will furnish the access point, mounting hardware, and outdoor rated Ethernet cable.

Wireless Traffic Sensor Access Point shall conform to the following:

For the access point box, use device that mounts to a pole, sign or traffic signal, is wireless, has DC power input, and 2-way radio communications.

For the access point box, use weatherized Ethernet or CAT 5 cable for connection no more than 325 feet (100 meters) long.

The access point box shall have a rack-mounted interface for a 2070 controller

Integrate the access point box with the wireless traffic sensors and repeater devices.

C Construction
Install contractor-furnished access point at locations the plans show.

Install access point box as manufacturer instructions show.

Take every precaution to ensure that the access point box is not damaged during storage or installation.

The contractor or field system integrator shall furnish all equipment, appliances, and labor necessary to test the installed access point box. Successfully perform the following tests before.

Make all communications connections between the wireless sensor mode, access point and repeater, as required to provide a fully operational detection system.

After the access point box has been installed, and all other sensor equipment has been installed, the ATMS field system integrator shall successfully perform a field test at the sensor location to verify the sensor is detecting vehicles and accurately relaying the information to the access point.

Furnish all test equipment.

Following successful completion of the test, activate the entire detection system and leave it on for 30 consecutive days. During this period, ensure that all materials and components of the sensor system furnished and installed operate as specified and without any failure.

In the event that any contractor-provided component of the sensor system malfunctions or operates below the level specified, the department will terminate the test period, and will require the ATMS field system integrator to determine and correct the problems, including repair or replacement of equipment, at no cost to the department. Upon correction of the problems, the engineer will start a new 30-day test period. If a malfunction is the result of equipment not installed by the contractor, the engineer will suspend the acceptance test period until the responsible party corrects these problems.

D Measurement

The department will measure Wireless Traffic Sensor Access Point as each individual unit, acceptably completed.

E. Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2041	Wireless Traffic Sensor Access Point	Each

Payment for Wireless Traffic Sensor Access Point is full compensation for installing all materials, necessary to completely install the access point; and for installing identification plaques when required.

244. Wireless Traffic Sensor Repeater, Item SPV.0060.2042.

A Description

This section describes installing a repeater to extend the range of coverage between the sensor nodes and access point.

B Materials

Under the Wireless Traffic Sensor Repeater bid item, use device that mounts to a pole, sign or traffic signal, has a battery life of at least two years, 16 frequency channels available, ability to handle 10 sensors per application, and can communicate with the access point at a range up to 1,000 feet (305 meters). Integrate the repeater device with the wireless sensor node and the access point box.

C Construction

Install contractor-furnished repeater at locations the plans show.

Install access point box as manufacturer instructions show.

Take every precaution to ensure that the sensor node is not damaged during storage or installation.

The contractor or field system integrator shall furnish all equipment, appliances, and labor necessary to test the installed sensor node.

Make all communications connections between the wireless sensor mode, access point and repeater, as required to provide a fully operational detection system.

After the repeater has been installed, and all other sensor equipment has been installed, the ATMS field system integrator shall successfully perform a field test at the sensor location to verify the sensor is detecting vehicles and accurately relaying the information to the access point.

Furnish all test equipment.

Following successful completion of the test, activate the entire detection system and leave it on for 30 consecutive days. During this period, ensure that all materials and components of the sensor system furnished and installed operate as specified and without any failure.

In the event that any contractor-provided component of the sensor system malfunctions or operates below the level specified, the department will terminate the test period, and will require the ATMS field system integrator to determine and correct the problems, including repair or replacement of equipment, at no cost to the department. Upon correction of the problems, the engineer will start a new 30-day test period. If a malfunction is the result of equipment not installed by the contractor, the engineer will suspend the acceptance test period until the responsible party corrects these problems.

D Measurement
The department will measure Wireless Traffic Sensor Repeater as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2042	Wireless Traffic Sensor Repeater	Each

Payment for Install Repeater is full compensation for installing all materials, necessary to completely install the sensor node; and for installing identification plaques when required.

245. Wireless Traffic Sensor Contact Closure Module, Item SPV.0060.2043; Wireless Traffic Sensor Contact Closure Extension Card, Item SPV.0060.2044.

A Description
This section describes furnishing and installing wireless traffic sensor contact closure modules and expansion cards to facilitate the connection of the wireless traffic sensors to ramp meter controllers.

B Materials
Furnish contact closure modules and expansion cards that are fully interoperable with the Wireless Traffic Sensors and associated equipment as provided under other pay items in this contract.

Under the respective bid items, integrate the contact closure modules and extension cards with the repeater device, wireless sensor node and the access point box.

Wireless Traffic Sensor Contact Closure Modules shall accommodate four contact closures and must function in a 170 / 2070 style contact closure rack system.

Wireless Traffic Sensor Extension Cards shall accommodate one contact closure per card and must function in a 170 / 2070 style contact closure rack system.

C Construction
Install Wireless Traffic Sensor Contact Closure Modules and Wireless Traffic Sensor Extension Cards at locations as show on the plans or as directed by the engineer.

Install furnished materials per manufacturer instructions.

Take every precaution to ensure that the materials are not damaged during storage or installation.

The contractor or field system integrator shall furnish all equipment, appliances, and labor necessary to test the installed equipment.

Make all communications connections among the contact closure module, expansion card, wireless sensor mode, access point and repeater, as required to provide a fully operational detection system.

After all sensor equipment has been installed, the FTMS Field System Integrator shall perform a field test at the sensor location to verify the sensor is detecting vehicles and accurately relaying the information to the access point.

Furnish all test equipment.

Following successful completion of the test, activate the entire detection system and leave it on for 30 consecutive days. During this period, ensure that all materials and components of the sensor system furnished and installed operate as specified and without any failure.

In the event that any contractor-provided component of the sensor system malfunctions or operates below the level specified, the department will terminate the test period, and will require the ATMS field system integrator to determine and correct the problems, including repair or replacement of equipment, at no cost to the department. Upon correction of the problems, the engineer will start a new 30-day test period. If a malfunction is the result of equipment not installed by the contractor, the engineer will suspend the acceptance test period until the responsible party corrects these problems.

D Measurement

The department will measure Wireless Traffic Sensor Contact Closure Module and Wireless Traffic Sensor Contact Closure Extension Card as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2043	Wireless Traffic Sensor Contact Closure Module	Each
SPV.0060.2044	Wireless Traffic Sensor Contact Closure Extension Card	Each

Payment for Wireless Traffic Sensor Contact Closure Module and Wireless Traffic Sensor Contact Closure Extension Card is full compensation for installing all materials, necessary to completely install the module and extension module; and for installing identification plaques when required.

246. Adjusting Communication Vault, Item SPV.0060.2045.

A Description

This special provision describes raising an existing communication vault up to 6-inches to change from existing grade to proposed grade without disturbing the existing conduits and cable in the communication vault.

B Materials

Materials include existing communication vault and restoration materials such as backfill, topsoil, seeding, mulch, and fertilizer in accordance to the pertinent provisions of standard specs 201, 625, 627, 629, 630, 636, 640, and 673.

C Construction

Without disturbing the existing conduit or cables, excavate around the existing communication vault an area sufficient to raise the existing communication vault and backfill under it with materials consistent with the requirements of standard spec 673.

To raise communication vault as required to match the proposed grade, backfill with material similar to the material surrounding the removal and consistent with the requirements of standard spec 673 and restore the disturbed area by placing 4-inches of topsoil, and fertilize, seed, and mulch all disturbed areas in accordance to the pertinent requirements.

Extend the existing conduits up from the bottom of the existing communication vault to a height consistent with the requirements of the standard specifications by using appropriately sized split duct systems while not disturbing the existing cables.

D Measurement

The department will measure Adjusting Communication Vault by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2045	Adjusting Communication Vault	Each

Payment is full compensation for removing and disposing of a communication vault; and for backfill, topsoil, fertilizer, seed and mulch.

247. Loop Detector Wire Protection, Item SPV.0060.2046.

A Description

This special provision describes furnishing and installing a loop detector splice kit for the purpose of protecting the loop detector wire between installation of the loop detector and installation of the loop detector lead-in-cable.

B Materials
Use cast-in-place splice kits from an approved manufacturer.

C Construction
Provide an additional 10-feet of slack loop detector wire connected to the installed loop detector in the pull box or manhole. Install the splice capsule conforming to the manufacturer's instructions around both ends of the slack loop detector wire to protect the wire until it may be permanently spliced onto the loop detector lead-in cable. At the time of splicing onto the permanent loop detector lead-in cable, cut the excess slack from the loop detector wire and discard the wire and the splice kit installed to protect it.

D Measurement
The department will measure Loop Detector Wire Protection by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2046	Loop Detector Wire Protection	Each

Payment is full compensation for furnishing and installing the required protection splice kits.

248. Removing Temporary Vehicle Detector Assembly, Item SPV.0060.2047.

A Description
This special provision describes removing temporary vehicle detector assemblies from their respective locations in the project area, salvaging the individual components for pick up by the department, and disposing of unwanted components as appropriate.

B Materials
Materials will include state-furnished materials and contractor furnished materials.

State-furnished materials include the following:

- One Electronic Integrated Systems, Inc. (EIS) Remote Traffic Microwave Sensor (RTMS) with integral 900 MHz serial radio.
- One solar power system consisting of 2-85W panels, 2-120 Amp-Hour batteries, a solar power controller, and one solar power cabinet to house the batteries and controller.

Contractor furnished materials include the following:

- One type 4 or larger wood pole. The wood pole shall be western red cedar in accordance to ANSI standards 05.1. Pressure treatment shall be 5% pentachlorophenol with a minimum of 8 pounds per cubic foot net retention of the oil-borne preservative. Pole shall be shaved the entire length.
- Outdoor rated Power cable between solar power system output and state-furnished RTMS.
- Mounting hardware for solar power system and RTMS detector.

C Construction
As directed by the engineer, remove the temporary vehicle detector assemblies from their respective locations in the project. Be careful not to damage any of the components that make up the system.

Salvage the state-furnished materials described above for pick up by the department.

Dispose of the wood pole and other non-reusable materials appropriately away from the project site.

Restore the site to match the existing surrounding area using standard restoration items as described in the standard specifications.

D Measurement
The department will measure Removing Temporary Vehicle Detector Assembly as each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price each under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.2047	Removing Temporary Vehicle Detector Assembly	Each

Payment is full compensation for removing the assembly; for salvaging the state-furnished materials; disposal of other materials off site; and for restoration of the site.

249. Concrete Bases Type 1 Spread Footing, Item SPV.0060.3001; Concrete Control Cabinet Base Type 9 Special (Mod.), Item SPV.0060.3002.

A Description
Work under this specification shall be done in accordance to standard spec 654, contract plan detail, and these special provisions.

B Materials
Materials shall be in accordance to standard spec 654.

C Construction
Construction shall be in accordance to standard spec 654.

D Measurement
The department will measure Concrete Bases (Type) bid items as each individual base, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.3001	Concrete Bases Type 1 Spread Footing	Each
SPV.0060.3002	Concrete Control Cabinet Base Type 9 Special (Mod.)	Each

Payment is full compensation for providing concrete bases; for embedded conduit and electrical components; for anchor rods, nuts, and washers; for bar steel reinforcement, if required; for excavating, backfilling, and disposing of surplus materials.

250. Traffic Signal Vault, Item SPV.0060.3005.

A Description
This special provision describes furnishing and installing a Traffic Signal Vault and 2-piece vault lid.

B Materials
Furnish a communication vault and vault lid constructed of a combination of polymer concrete and fiberglass gray in color. All polymer concrete vaults are not acceptable.

Vault shall have an inside clear opening of 30” x 48” and the overall height shall be 48”. Stackable units are not acceptable.

The vault shall consist of a polymer concrete bottom ring with four corrugated fiberglass sidewalls and a polymer concrete top ring. The four corners of the vault shall be encapsulated in polymer concrete. No fiberglass taping of the sidewall panels will be accepted.

Furnish a vault lid with a minimum design load of 15,000 pounds and test load of 22,500 pounds. Testing shall be in accordance to SCTE-77- 2007, tested over a 10” x 10” plate. Tests utilizing a 10” x 20” plate are not acceptable. The vault lid shall consist of two interlocking pieces with each piece approximately 33” x 25.5”.

The vault lid shall have a permanent stamp that reads *WISDOT TRAFFIC SIGNALS*. The manufactures name and load rating shall also be stamped on the lid cover. The vault lid shall have two slots measuring ½” x 4” to use as a cover lift out. The lid shall be secured utilizing four ½” stainless steel penta-head bolts with stainless steel washers.

Furnish manufactured gaskets to be placed between the lid and top of vault to resist water from entering the vault.

The vault and cover shall be designed with a field replaceable locking mechanism. The cover shall be able to be removed and the nut in the vault shall be able to be replaced without damaging the vault.

The vault sidewalls shall be manufactured of corrugated fiberglass and the spacing between each corrugation shall measure approximately 8" to facilitate conduit placement. The sidewalls shall have a smooth exterior and be gel-coated.

The vault shall have four ½" bolts embedded on the underside of the top ring to be used for lifting purposes.

Furnish fiber optic cable support assembly consisting of multiple brackets, racks, and rails required to suspend the required surplus cabling and any splice enclosure for a single vault. The support assemblies shall be made from or coated with a weather resistant material to ensure no corrosion.

Furnish self-curing caulking to provide a permanent bond and made of flexible rubber that is not affected by sunlight, water, oils, mild acids, and alkali. Use mildew-resistant and non-flammable, gray caulk.

C Construction

Construct communications vault in accordance to standard spec 611.

Provide a manufacturer-approved knockout punch driver to provide openings in the vault for conduit if not provided. Voids between the conduit and vault shall not exceed ½". Caulk the interior and exterior of the communication vault. Cure caulking according to manufacturer's specifications before backfilling.

Secure vault lid to vault with the manufacturer supplied hardware.

Anchor the support assemblies to the existing vault using stainless steel hardware.

D Measurement

The department will measure the Traffic Signal Vault bid item as each individual vault, complete and accepted in place.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.3005	Traffic Signal Vault	Each

Payment is full compensation for furnishing and installing all materials including vaults, lids, bolts, washers, mounting hardware, and caulking; for excavating, bedding, backfilling and restoration of ground to original condition including sand, aggregate, concrete, or other required materials; and for disposing of surplus materials.

251. Traffic Polymer Concrete Vault 13-Inch x 24-Inch x 18-Inch , Item SPV.0060.3103; 17-Inch x 30-Inch x 18-Inch , Item SPV.0060.3104.

A Description

This special provision describes furnishing and installing Polymer Concrete Vaults in accordance to current City of Milwaukee methods.

B Materials

B.1 General

Polymer Concrete shall be manufactured from one of the general types and grades defined in polymers in concrete structural applications state of the art report, ACI 548.6R-96 for structural uses. Thermoplastics will not be acceptable.

Enclosure walls shall be made from pattern cut structural fiberglass cloths to assure uniform, pre-measurable fiberglass content on all areas. Chopper gun fiberglass construction is not acceptable.

Binding polymers used in the manufacture of the polymer concrete and the fiber reinforced polyester shall be of the same formulation or from formulations with demonstrated chemical compatibility to assure complete chemical bonding of all components. Fiber reinforced polyester wall sections must be cast integrally into and chemically bonded within the upper polymer concrete casting.

B.2 Testing

Meet ANSI/SCTE 77 2010 **(**Tier 15 or greater**)**, ASTM C 857, and WUC 3.6 structural requirements.

Compressive Modulus of Elasticity (fiberglass reinforced polymer): 5.6×10^6 PSI tested in accordance to procedures outlined in ASTM D-695

Comprehensive Strength (fiberglass reinforced polymer): 24,300 PSI tested in accordance to ASTM D-695

Flexural Strength (fiberglass reinforced polymer): 18,700 PSI tested in accordance to ASTM D-790

Tensile Strength (fiberglass reinforced polymer): 12,100 PSI tested in accordance to procedures outlined in ASTM D-638

Tensile Modulus of Elasticity (fiberglass reinforced polymer): 8.6×10^5 PSI tested in accordance to procedures outlined in ASTM D-638

Splitting Tensile Strength (polymer concrete): Tested in accordance to procedures outlined in ASTM C-496

Accelerated Service: Tested in accordance to procedure E outlined in ASTM D-756

Water Absorption: Tested in accordance to ASTM D-570 outlined in sections 6.1 and 6.5

Impact Resistance (fiberglass reinforced polymer concrete): 72 foot pounds in accordance to ASTM D-2444 administered with a “C” tip.

Skid Resistance: 0.60 coefficient of friction in accordance to ASTM C-1028

Flammability Test: Tested in accordance to ASTM D-635

Ultraviolet Exposure: Tested in accordance to ASTM test method G-53

Chemical Resistance

1. Sodium Chloride 5%
2. Sodium Carbonate 0.1 N
3. Hydrochloric Acid 0.2 N
4. Acetic Acid 5%
5. Sulfuric Acid 0.1N
6. Sodium Sulfate 0.1 N
7. Sodium Hydroxide 0.1N
8. Kerosene Oil per ASTM D-543
9. Transformer Oil per ASTM D-543

The street lighting vaults and covers shall be gray in color and shall be flared wall as indicated on the Drawings. Covers shall be provided with 2 stainless steel bolts. Each cover shall have the words "TRAFFIC" cast into its surface along the longest dimension. The words shall be permanently recessed into the surface.

C Construction

Install rectangular flared wall vaults according to current City of Milwaukee standards. Provisions for inserting conduit into any side or the bottom of the vault shall be included.

D Measurement

The department will measure the Polymer Concrete Vault (size) bid item as each individual vault, complete and accepted in place.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.3103	Traffic Polymer Concrete Vault 13-Inch x 24-Inch x 18-Inch	Each
SPV.0060.3104	Traffic Polymer Concrete Vault 17-Inch x 30-Inch x 18-Inch	Each

Payment is full compensation for furnishing labor, equipment, coordination and all materials and incidentals necessary to complete the work.

252. Anchor Assemblies Sign Bridge Structures, ItemSPV.0060.4100; Anchor Assemblies Noise Barrier Structures, Item SPV.0060.4105.

A Description

Furnish and install anchor bolt assemblies for light poles, noise barriers and signal poles that will be installed on bridges and retaining walls as shown on the plans.

B Materials

Anchor bolts shall be of size and spacing as given on the plans and conform to AASHTO M 314 GR 55. Provide heavy hex nuts conforming to AASHTO M 292 and hardened washers conforming to AASHTO M 293. Provide embedded anchor plates for anchor assemblies as shown on the plans conforming to AASHTO M 223. Provide six nuts and washers per anchor bolt for Anchor Assemblies Light Pole Structures. Provide five nuts and washers per anchor bolt for Anchor Assemblies Noise Barriers Structures. Provide four nuts and washers per anchor bolt for Anchor Assemblies Signal Poles Structures.

Hot dip galvanize the entire anchor assembly. Galvanize embedded anchor plates conforming to AASHTO M 111 and galvanize anchor bolts, nuts and washers conforming to AASHTO M 232. Provide enlarged threads on nuts for proper fit after galvanizing.

C Construction

Install embedded anchor assemblies in concrete structures at locations as shown on the plans. Mount anchor assemblies to formwork or otherwise provide positive support of anchor assembly within formwork as necessary to prevent movement, shifting or misalignment of the anchor assembly during subsequent concrete placement. Protect or clean exposed anchor bolt threads from concrete splatter.

Coordinate location and spacing of anchor assemblies embedded in bridges and retaining walls for mounting noise barriers on bridges and retaining walls with approved noise barrier shop drawings.

D Measurement

The department will measure Anchor Assemblies Light Poles Structures, Anchor Assemblies Noise Barriers Structures, and Anchor Assemblies Signal Poles Structures by each individual anchor assembly, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4100	Anchor Assemblies Sign Bridge Structures	Each
SPV.0060.4105	Anchor Assemblies Noise Barrier Structures	Each

Payment is full compensation for furnishing and installing the anchorages.

253. Pile Dynamic Analyzer (PDA) Testing, Item SPV. 0060.4110; Pile Dynamic Analyzer (PDA) Restrikes, Item SPV. 0060.4115.

A Description

These items consist of providing means to perform Pile Dynamic Analyzer (PDA) load testing by the engineer, as outlined in the contract plans and this special provision. This Dynamic Pile Load Testing is being done to set pile resistance criteria. Production piles will be driven in accordance to pile resistance criteria produced by the engineer after PDA testing at each substructure unit. PDA Restrikes will be needed as described in this special provision and/or as directed by the engineer.

The piles and pile driving will be paid for under the appropriate special provision for piles and pile driving contained within this contract. This applies to both piles installed using the PDA criteria and for production piles installed using the criteria developed by the engineer from the PDA installations.

Data collected during the testing described herein will form the basis for the final driving criteria to be applied to production piles in the substructure unit under consideration.

B (Vacant)

C Construction

C.1 Test Locations

The engineer will perform dynamic pile load testing at the pile locations identified on the plans. These locations are referred to simply as 'PDA Test Piles' throughout the remainder of this specification. Piles noted as PDA Test Piles are a functional load-carrying part of the completed foundation unit and not solely used for testing.

C.2 Driving Sequence

The engineer will perform PDA testing on the first piles installed in the substructure. PDA Test Piles shall be located as shown on the footing plan. No other piles in the substructure unit shall be used for PDA testing unless agreed to by the engineer. Do not drive any other piles in the unit until all required testing has been completed and accepted by the engineer and the final driving criteria for that substructure unit has been determined and issued to the contractor in writing.

C.3 Pile Driving

Drive PDA Test Piles to penetration depths and/or penetration resistances as directed by the engineer. Drive PDA Test Piles using the accepted production driving equipment.

C.4 Scheduling

Provide a written schedule to the engineer showing all required PDA Test Piles activities for the following week. Submit this schedule a minimum of 2 working days prior to the first day included in the schedule. Schedule the work so that PDA testing activities of any kind - installation tests, or restrike tests - will occur at no more than two locations at any

given time. Schedule a minimum of one complete working day after PDA testing, (which includes restrike testing, see section C 6) is complete at a substructure unit for the engineer to provide final driving criteria for that location. If testing is complete at multiple substructure units, final driving criteria will be provided at the maximum rate of one substructure unit per one working day and in the order specified by the contractor in the testing schedule.

C.5 Installation Testing

The engineer will take dynamic measurements following procedures set forth in ASTM D-4945 during the driving of piles designated as PDA Test Piles.

Prior to placement in the leads, make each designated PDA Test Pile available for predrilling the required instrument attachment holes. Support PDA Test Piles on blocking, and roll or re-position PDA Test Piles as required to facilitate the predrilling of attachment holes. The engineer will furnish the equipment, materials, and labor necessary for drilling holes in the piles. Allow a minimum of one hour per pile for this operation. Furnish vehicle access to the substructure unit to allow for PDA testing.

Attach and remove the instruments to and from the pile following the engineer's instructions. Take precautions and exercise care to ensure that gauges and sensors are not damaged during installation or pile movement. Check and reinstall gauges and sensors during pile driving operations at the direction of the engineer. The engineer has the option to access a pile in the leads prior to and during driving operations to ensure that the gauges and sensors have been properly installed. Make available to the engineer a safety line attached to the pile leads for the engineer's use. Provide the engineer with sufficient time to inspect, attach, and remove gauges and sensors on the pile, if it is necessary.

It is estimated that approximately one hour per pile will be needed for both instrument attachment and removal for a total of 2 hours per installation. Continuous PDA monitoring may require multiple installations of PDA testing equipment depending on the supplied pile length. If multiple pile lengths are used to produce the final installed pile, multiple PDA equipment installations will be required.

Furnish electric power for the dynamic test equipment. The power supply at the outlet shall be 10-amp, 115-volt, 55- to 60-cycle, alternating current (AC) only. Field generators used as the power source shall be equipped with functioning meters for monitoring voltage and frequency levels.

Pile-driving criteria for each substructure unit shall be determined from dynamic pile tests conducted on the total length of each pile noted for PDA Testing in the plans. Driving on these piles shall continue until the required driving resistance is achieved for 30 consecutive hammer blows. Mark penetration per 10 consecutive hammer blows as directed by the engineer. The engineer will utilize the dynamic test data to establish the following pile driving criteria: (1) a minimum driven length below cutoff level, and (2) a maximum penetration rate per 10 hammer blows for 30 consecutive blows. Drive all remaining piles in that unit in accordance to the established criteria. The engineer may

alter driving criteria as necessary to assure development of adequate pile capacity. In any pile where pile capacity or integrity is suspect, the engineer may order PDA testing.

With the PDA testing equipment attached, drive the pile as directed by the engineer.

C.6 Restrike Tests

An initial restrike test will be performed on all test piles as part of the initial dynamic pile load test as described in section C.5.

Restrike each test pile with the required dynamic testing equipment between 6-24 hours after the end of each initial pile installation.

Warm the hammer before the restrike by applying at least 20 blows to a non-test pile, or by other means acceptable to the engineer.

The maximum amount of penetration required during the restrike test will be 6 inches, or the maximum number of hammer blows required will be 30, whichever occurs first.

The pre-approved pile-driving hammer used for restrike testing shall be capable of supplying enough energy to develop a minimum of twice the required driving resistance shown on the plans.

Required driving resistance for production piles will be determined by dynamic pile testing conducted by the engineer.

D Measurement

The department will measure Pile Dynamic Analyzer PDA Testing as a unit, acceptably completed, in which one unit includes all PDA-related effort on one pile during the initial driving.

The department will measure PDA Restrikes as a unit, acceptably completed, in which one unit includes all of the restrike testing required each time the contractor sets up on a pile to do a restrike test.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4110	Pile Dynamic Analyzer (PDA)Testing	Each
SPV.0060.4115	Pile Dynamic Analyzer (PDA) Restrikes	Each

Payment for PDA Testing is full compensation for facilitating the initial dynamic pile load test on a given pile, including the possible multiple sensor installations.

Payment for PDA Restrikes is full compensation for facilitating and doing one restrike test, including the sensor installation.

F Delays and Standby Time

The department will assess a penalty if the contractor is not ready when the department/engineer is requested to perform the PDA tests on piles, and the department is unable to begin PDA testing on the same working day as scheduled, due to contractor delay. The penalty will be $1500/day for all working days that PDA Testing is scheduled on the project site, but no PDA testing is completed due to the contractor not being ready to perform the scheduled monitoring/driving.

254. Bearings High-Load Multi-Rotational Fixed, Item SPV.0060.4120; Bearings High-Load Multi-Rotational Guided, Item SPV.0060.4125.

A Description

This special provision describes designing, manufacturing, furnishing, fabricating, and installing high-load multi-rotational bearing assemblies in accordance to the details shown on the plans, standard spec 506, as directed by the engineer, and as hereinafter provided. Define high-load multi-rotational bearings as pot or disc style bearings where called for on the plans.

This work includes providing complete pot or disc bearing assemblies including sole plate, piston, sealing rings, elastomeric pad, pot, masonry plate, intermediate load distribution plates, polyether urethane disc, shear resisting mechanism, structural bolts for connecting upper portion of bearing assembly to the superstructure member, anchor bolts and non-shrink grout for attaching the masonry plate to the concrete pedestal placed on the substructure beam seat.

A.1 Qualifications of the Manufacturer

Demonstrate a minimum of 5 years experience in the design and manufacture of high-load multi-rotational bearings of the type specified. Be certified under the American Institute of Steel Construction Quality Certification Program – Simple Steel Bridges.

B Materials

B.1 General

Used new and unused materials, with no reclaimed material incorporated into the finished bearings, that conform to the applicable provisions of standard spec 506 and to the following standards. Any visual defects will be cause for rejection.

B.2 Bearing Types

Multi-Rotational Fixed bearings allow rotation in all directions but do not allow any horizontal movement.

Multi-Rotational Guided bearings allow rotation in all directions while allowing horizontal movement in only one direction as shown on the plans and resist horizontal forces in constrained directions.

B.3 Steel Plate
Use steel plate that conforms to the requirements of ASTM A709, Grade 36, Grade 50, or Grade 50W.

B.4 Stainless Steel
Use stainless steel that conforms to the requirements of ASTM A240, Type 304, Number 8 finish.

B.5 Brass
Use brass for sealing rings used in pot bearings that conforms to the requirements of ASTM B36, half-hard alloy 260.

B.6 Polytetrafluoroethylene (PTFE)
Manufacture PTFE from pure virgin unfilled TFE resin conforming to ASTM D4894 or D4895. Provide PTFE material that is resistant to acids, alkalis and petroleum products, non-absorbing to water, stable from -360 degrees F to +500 degrees F, and non-flammable. Meet the following test requirements:

Physical Property	ASTM Test Method	Requirement
Ultimate Tensile Strength, min.	D638	2800 psi
Ultimate Elongation, min.	D638	200%
Specific Gravity	D792	2.12

B.7 Adhesive
Use adhesive to bond sheet PTFE mad of an epoxy material stable from -100 degrees F to +250 degrees F.

B.8 Elastomer
Use an elastomeric rotational element in the construction of pot bearings containing only virgin crystallization-resistant polychloroprene (Neoprene) conforming to AASHTO M251 (ASTM D4014). Use neoprene with physical properties that conform to the specifications above with modifications as follows:

Provide Shore A Durometer hardness of 50 +/- 10 points.

Use Type 2 die to prepare samples for compression set tests.

Use neoprene conforming to minimum low temperature property Grade 4. An elastomer of a higher grade number may be used.

B.9 Polyether Urethane Disc
Mold the disc bearing polyether urethane disc from a polyether urethane compound. Construct it per AASHTO LRFD Bridge Construction Specifications, Section 18.3.2.8 and meet the following test requirements:

Physical Property	ASTM Test Method	Requirement
Hardness, Shore D Durometer	D2240	45 min. 65 max.
Tensile Stress	D412	
At 100% Elongation, min.		1500 psi
At 200% Elongation, min.		2800 psi
Tensile Strength, min.	D412	4000 psi
Ultimate Elongation, min.	D412	220%
Compression Set After 22 Hours	D395 (Method B)	
Temperature		158 degrees F
Compression set, max.		40%

B.10 Connecting Bolts

Use high strength bolts that conform to the requirements of standard spec 506. Use lock washers that are steel, regular, helical spring washers meeting ANSI B18.21.1. Galvanize lock washers according to AASHTO M232. Coordinate all bolted connections between the bearing manufacturer and the structural steel fabricator for the steel superstructure members. Use bolts to connect the top plate of the bearing to the steel superstructure members using a "snug tight" connection as defined in American Association of State Highway Transportation Officials (AASHTO) LRFD Bridge Construction Specifications, Section 11.5.6.4.

B.11 Anchor Bolts

Provide anchor rods as shown on the plans and in accordance to ASTM F1554 (Grade 105) and hot-dip galvanize in accordance to AASHTO M232.

B.12 Grout

Use non-metallic, non-corrosive, non-shrink grout for filling anchor bolt blockouts per ASTM C1107 with minimum 28-day compressive strength called for on the plans.

B.13 Bearing Pads

Provide a 1/8" thick bearing pad the same size as the masonry plate conforming to 506.2.6.

C Construction

C.1 Design Requirements

C.1.1 General

Design bearings for the loads and movements given on the plans and in accordance to AASHTO LRFD Bridge Design Specifications, Section 14. Include a minimum rotation of 0.02 radians or the design rotation, whichever is greater, in bearing designs. In these rotations, include all applicable service loads and movements shown on the plans, maximum rotations caused by fabrication and installation tolerances, and allowance for uncertainty. In the designs, assume that vertical and horizontal loads occur simultaneously. Include all bearing components, load plates, sole plates, masonry plates, elastomeric pads, connection bolts, and concrete anchor bolts in the design.

Meet the following additional design requirements for the bearings:

C.1.2 Pots

Machine the pot from a single piece of steel. Provide the pot cavity with an inside diameter nominally equal to the diameter of the elastomeric pad. Provide a pot deep enough to permit the seal and piston rim to remain in full contact with the vertical face of the pot wall under all design loads, movements, and rotations. Do not permit contact between metal components preventing further displacements or rotation. Provide pot walls designed to withstand both the internal pressures caused by the vertical loads (considering the elastomer to behave as a fluid) and the design lateral loads.

C.1.3 Pistons

Machine the piston from a single piece of steel. Use a piston thickness sufficient to provide at least 0.125 inch vertical clearance between rotating and non-rotating components of the bearing assembly at maximum rotation.

Provide an outside diameter of the piston at least 0.04 inches less than the inside diameter of the pot.

For bearings carrying horizontal loads, design the piston and mating pot wall thickness to meet the requirements of AASHTO LRFD 14.7.4.7.

C.1.4 Sole and Masonry Plates

Design the sole and masonry plates to distribute the bearing loads into the surrounding substructure and/or superstructure. Provide a sole or masonry plate thickness as shown on the plans but not be less than 0.75 inch. Provide shim plates or thicker masonry and sole plates than are required due to strength considerations alone to meet service and installation considerations specified by the engineer, such as weldability and bearing height. Provide the masonry plate with a machined recess sized to allow the snug placement of the piston, pot or lower bearing plates.

C.1.5 Upper and Lower Steel Plates

Apply, as appropriate, the provisions of AASHTO LRFD Bridge Design Specifications, Sections 3, 4, and 6 to the design of the upper and lower steel plates used in disc bearings. Limit the thickness of each of the upper and lower steel plates to a minimum of 0.045 x disc diameter.

C.1.6 Guide Bars

When necessary, weld guide bars to the slide plates. Design guide bars for the specified horizontal loads, but not less than 10 percent of the vertical capacity of the bearing.

Provide guided members with their contact area within the guide bars in all operating positions. Provide a total clearance between guide bars and the guided member of 1/16 inch, +/- 1/32 inch.

C.1.7 Finish of Steel Components

Finish all steel surfaces in contact with elastomer, PTFE, or other steel surfaces, to a smoothness of 125 micro-inch (rms) or less.

C.1.8 Stainless Steel Sheet

Use stainless steel sheets of 16 gauge minimum thickness when the maximum dimension of the surface is less than or equal to 12.0 inches or use a minimum of 13 gauge when the maximum dimension is larger than 12.0 inches. Attach the stainless steel sheets to their backing plates by continuous fillet welding along their edges. Do no bond and/or mechanically fasten any of the stainless steel sheets. Design and attach the stainless steel sheets to their backing plates with a connection capable of resisting the frictional force set up in the bearing. Weld in accordance to AWS D1.6. Extend the backing plates beyond the edge of the stainless steel sheets to accommodate the welds and do not protrude the welds above the stainless steel sheets. It is essential that stainless steel sheets remain in contact with base metal throughout their service life such that interface corrosion does not occur.

Face the stainless steel sheets downward and completely cover the PTFE sheets in all operating positions, plus one additional inch in the direction of movement. Finish the surfaces in contact with the PTFE to a smoothness of 20 micro-inch (rms) or less.

C.1.9 Brass Sealing Rings

Use flat brass sealing rings with a minimum width of 0.375 inch and a minimum thickness of 0.09375 inch. Use a minimum number of 3 and a maximum number of 4 rings, depending upon the design load of the bearings. Finish the rings to a smoothness of 63 micro-inch (rms) or less.

Do not exceed 0.01 inch between the ring and the wall. Provide one vertical cut at 45 degrees to the tangent with a maximum gap of 0.05 inch on each ring. Stagger the gaps a minimum of 90 degrees relative to one another when the rings are in place.

C.1.10 PTFE Sheets

Provide PTFE sheets with a minimum thickness of 0.125 inch, and bond with epoxy into a square-edged recess of a depth equal to one-half the PTFE sheet thickness. Make the shoulders of the recesses sharp and square. Provide smooth PTFE surfaces free from blisters and bubbles. Design the PTFE sheets in accordance to AASHTO LRFD Bridge Design Specifications, Section 14.7.2.

C.1.11 Elastomeric Disc

Individually mold, in one piece, all elastomeric discs. Do not layer or stack the discs. Cuts, gouges, or nicks from machine cutting or flash trimming are cause for rejection.

Mold the sealing groove integrally. Provide elastomeric discs square to the pad top surface and of the same nominal dimension as the brass sealing rings.

Design the discs for an average stress on the elastomer at the service limit state not to exceed 3500 psi.

C.1.12 Polyether Urethane Disc
At the service limit state, design the disc so that its instantaneous deflection under total load does not exceed 10% of the thickness of the unstressed disc, and the additional deflection due to creep does not exceed 8% of the thickness of the unstressed disc.

Design the components of the bearing as not to lift off each other at any location at the service limit state.

Do not exceed an average stress on the disc at the service limit state of 5000 psi. If the outer surface of the disc is not vertical, compute the stress using the smallest plan area of the disc.

C.1.13 Translation Capacity
Provide the translation capability for both guided and non-guided bearings by means of a polished stainless steel sliding plate that bears on a PTFE sheet or other approved material.

C.1.14 Geometric Limitations
Limit the horizontal dimensions to the available bearing seat area of the concrete and the bottom flanges as detailed on the plans. Submit any modifications required to accommodate the bearings chosen to the engineer for approval prior to ordering materials. Prepare any modifications required at no additional cost to the department.

C.1.15 Future Maintenance
Design and manufacture bearings so that future maintenance of the bearings can be performed. Demonstrate in writing how individual components of the bearings or entire assemblies could be replaced. Restrict vertical upward movement of the superstructure and structural steel, due to jacking, to less than 0.5 inch. Prepare procedures for future replacements of individual components for approval by the engineer prior to the manufacture of any bearings for this project.

C.2 Structural Steel Coordination
Coordinate all connections and fit up between the bearing manufacturer and the structural steel fabricator. Submit any modifications from details shown in the plans required to accommodate the bearings chosen to the engineer for approval prior to ordering materials. Prepare any modifications required at no additional cost to the department.

C.3 Submittals
Sumbit the following items to the engineer for review and approval prior to fabrication of the bearing assemblies:

- Shop drawings for all components and assemblies, including general arrangements and large scale details. Include with the shop drawings tables showing load capacity and movement rating, if applicable, of each bearing, including initial offset required at various ambient temperatures. Include the manufacturer's instructions for proper installation of the bearing assemblies in the shop drawings. Shop drawings which lack manufacturer's installation instructions will be returned without approval.
- Calculations showing conformance of the bearings to the design loadings, movements and other specified requirements.
- Welding procedures. Use qualification procedures of AWS D1.5 and D1.6 for all shop welders, welding operators, welding equipment, and welding procedures.
- Drawings indicating surfaces to be painted or zinc metalized in accordance to section C.7 of this special provision and type of coating used.

C.4 Responsibility

Review and approval of the manufacturer's calculations and shop drawings by the engineer does not relieve the manufacturer of complete responsibility for their accuracy and completeness.

C.5 Shop Inspection

The engineer reserves the right to visit the manufacturer's fabrication shop for purposes of inspecting the manufacturing, assembly, testing, and painting of the bearings. Allow the inspectors free access to the necessary parts of the manufacturer's plant. Notify the engineer at least two weeks in advance of manufacturing.

C.6 Fabrication Requirements

C.6.1 Tolerances

Provide fabrication and tolerances in accordance to the requirements of the AASHTO LRFD Bridge Construction Specifications, and as herein specified.

C.6.2 Determination of Flatness

Use the following method to determine the flatness of bearings after welding and fabrication:

- Place a precision straightedge that is longer than the nominal dimension to be measured in contact with the plate surface to be measured.
- Select a feeler gage with a thickness corresponding to the flatness tolerances of the AASHTO code cited above and having a tolerance of +/-0.001 inch, and attempt to insert it under the straightedge.
- Flatness is acceptable if the feeler does not pass under the straightedge.

C.7 Painting or Metalizing

Paint or zinc metalize the bearing assemblies in accordance to AWS C2.18-93 and AWS C2.23:2003. Do not galvanize. Do not paint or metalize the pot cavity and all surfaces covered by stainless steel or PTFE sheet. Mask off tapped holes during painting or metalizing.

C.8 Sampling, Testing, and Inspection

Sample in accordance to the AASHTO LRFD Bridge Construction Specifications, the standard specifications, or as determined by the engineer.

Perform all testing in the presence of a representative of the department or its designated inspection agency.

Perform three separate tests. Conduct the first test on all bearing types with the bearing loaded to 150% of the vertical design capacity at the specified design rotation, but not less than 0.02 radians. Maintain uniform contact on all rotational elements during the test. Maintain the test load for at least 30 minutes.

Conduct the second test to measure the coefficient of friction on a representative sliding bearing. During this test, load the bearing to 100% of the vertical design capacity while measuring the coefficient of friction. Measure the coefficient of friction at the bearing design capacity on the 5^{th}, 15^{th}, and 100^{th} cycles at a speed of 1-inch/minute. Run a total of 100 cycles. Calculate the sliding coefficient of friction as the horizontal load required to maintain continuous sliding at a given speed divided by the bearing's design capacity vertical load. Prior to testing, apply the vertical load continuously for a minimum of one hour. Do not exceed a measured sliding coefficient of friction of 0.03 at 68 degrees F, except when approved by the engineer.

Conduct the third test on fixed and guided bearing assemblies to verify the horizontal load carrying capacity. During this test, load the bearing to 100% of the vertical design capacity while applying a horizontal load equal to 150% of the horizontal design load capacity.

Replace any bearing showing failure of the sealing rings or other component parts during or after these load tests at no additional cost to the department.

Do not allow the following during testing:

- Binding of bearing components or other movement restrictions under design displacements and/or rotations.
- "Lift-off" or separation between plates and PTFE or elastomer under rotation
- The measured static and dynamic coefficient of friction exceeds 3%.
- Cracks or permanent deformation of the PTFE, stainless steel, other components, or welds.
- Extrusion of the elastomer or signs of cold flow of the PTFE.
- Instantaneous compression deflection under total load exceed 10% of the thickness of the unstressed disc for disc bearings.

Furnish the engineer with certified copies of the test reports on the physical properties of the component materials for the furnished bearings and a certification by the bearing manufacturer stating the furnished bearing assemblies conform to all the requirements shown on the plans and specifications contained herein.

Furnish the engineer random samples of component materials used in the bearings for testing by the department. The department reserves the right to have the manufacturer perform the specified load tests on one or more of the furnished bearings. A furnished bearing is defined as a high-load multi-rotational bearing assembly that has been delivered to the site. Replace the tested bearing, if it shows failure, at no additional cost to the department. Load test the remaining bearings for acceptance at the manufacturer's expense.

C.9 Identification, Storage, and Handling

Fully assemble each bearing at the manufacturing plant and deliver to the construction site as complete units. Submit copies of all delivery tickets to the engineer.

Stamp each sole plate, intermediate load plate, and masonry plate on their edge faces with the manufacturer's name, bearing type or model number, structure number, bearing number as shown on the plans, the installed location, bearing orientation, centerlines for alignment in the field, upstation direction, and top surface location.

Stamp the sole plate of each bearing assembly by the bearing manufacturer prior to shipping of the sole plates to the steel fabricator or construction site. Place the stamp on a surface visible after installation so it remains clearly visible after storage, painting, shipment to the fabricator, and delivery to the project field site.

Store each bearing in the fabrication shop or at an independent warehouse in a clean, dry, and covered facility until required at the project construction site. Transport and deliver the bearings to the project site when required for installation by others under a separate construction and erection contract. While in storage, keep the bearings banded, wrapped, and secured in a condition suitable for shipment. Store and ship the bearings in moisture-proof and dust-proof covers. Wrapping material is subject to the engineer's approval. Do not stack the bearings. Hold the bearings together with removable restraints so sliding surfaces are not damaged.

Do not disassemble the bearing devices prior to installation without the knowledge and consent of the engineer and manufacturer.

Repair or replacement of damaged bearing assemblies, in part or in whole, will be at the discretion of the engineer with no additional cost to the department.

C.10 Installation

Install the bearings in strict accordance to the manufacturer's instructions as approved by the engineer. Furnish technical assistance to the contractor and the engineer through the personal services of a technical representative who is a full time employee of the manufacturer during installation of the bearings. The manufacturer's technical representative is required to be present for the placement of the first bearing. At the option of the engineer or contractor, the technical representative may be required to be present for the placement of any number of additional bearings. Take measures to limit bearing rotation to 0.02 radians during construction.

D Measurement
The department will measure Bearings High-Load Multi-Rotational Fixed, Bearings High-Load Multi-Rotational Guided, and Bearings High-Load Multi-Rotational Non-Guided by the unit for each bearing, acceptably completed in accordance to the contract.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4120	Bearings High-Load Multi-Rotational Fixed	Each
SPV.0060.4125	Bearings High-Load Multi-Rotational Guided	Each

Payment is full compensation for designing, manufacturing, fabricating, galvanizing, metalizing, painting, testing, storing, furnishing, transporting, and installing acceptable bearings – including sole plate, bearing assembly, masonry plate, bearing pad, connection bolts, anchor bolts and non-shrink grout; for preparing shop drawings; for providing technical assistance at the project site.

255. Floor Drain Special, Item SPV.0060.4130.

A Description
This work consists of furnishing and installing bridge floor drains in accordance to standard spec 514, as shown on the plans, and as hereinafter provided.

B Materials
All materials shall conform to standard spec 514.2 except as modified herein.

C Construction
All construction methods shall conform to standard spec 514.3.

D Measurement
The department will measure Floor Drain Special by the unit for each floor drain, acceptably completed in accordance to standard spec 514.4(1).

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4130	Floor Drain Special	Each

Payment will be made in accordance to standard spec 514.5(2).

256. Anchor Slab Inlet Cover Special, Item SPV.0060.4140.

A Description
This special provision describes specialized inlet grates and frames cast in anchor slabs as detailed on the plans. Conform to standard spec 611, as modified in this special provision.

B (Vacant)

C (Vacant)
Construct the specialized inlet grates and frames as detailed on the plans.

D Measurement
The department will measure Anchor Slab Inlet Special as each individual, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4140	Anchor Slab Inlet Cover Special	Each

Payment shall conform to standard spec 611.5. Concrete masonry and bar steel reinforcement for the anchor slab will be paid for separately.

257. Tieback Anchors, Item SPV.0060.4150; Tieback Anchor Performance Tests, Item SPV.0060.4155.

A Description
A.1 General
(1) The work under this item consists of permanent, pressure-grouted or post grouted, ground anchors designed, furnished, installed, tested, and stressed in accordance to these special provisions and as shown on the plans.

(2) Install ground anchors that shall develop the load carrying capacity indicated on the plans in accordance to the testing subsection of these special provisions.

(3) The contractor has the option to provide an alternate permanent earth anchor system with the approval of the department. The contractor shall then be responsible for selecting the permanent earth anchor type, method of installation, and for determining the bond length and anchor diameter that shall develop the factored design loads indicated on the plans. The analysis, design, construction and testing of the post tiebacks shall conform to the AASHTO LRFD Bridge Design Specifications Fifth Edition with 2010 Interim and the AASHTO LRFD Bridge Construction Specifications. Third Edition with 2010 and 2011 Interims..

A.2 Qualifications of the Contractor
(1) The contractor performing the work described in these special provisions must have installed ground anchors for excavation retaining walls for a minimum of 5 years. Submit a list containing at least five projects where the contractor has installed ground anchors. Specifically, experience must demonstrate competence in the use of pressure or post grouting. At least one project must show evidence of permanence with a 5-year minimum

age. The project experience documentation must include a brief project description, construction methods used during installation, local soil conditions, actual construction time and contact information consisting of an individual's name and current phone number. Contacts must be capable of verifying project participation.

(2) Submit staff experience records of the engineer, drill operators, and on-site supervisors who will be assigned to the project. The staff records must contain a summary of each individual's experience and it must be complete enough for the engineer to determine whether each individual has satisfied the following qualifications.

(3) Assign an engineer to supervise the work who has at least four years of experience in the design and construction of anchored earth retaining structures in similar soils. Do not use consultants or manufacturer's representatives in order to meet the requirements of this section. Drill operators and on-site supervisors must have a minimum of one-year experience installing ground anchors with the contractor's organization.

(4) Submit your qualifications and staff experience records at the preconstruction meeting or 21 calendar days prior to the start of ground anchor installation, whichever date is earlier. The engineer will approve or reject the contractor's qualifications and staff experience records within 14 calendar days after receipt of the submission. Do not start work on any ground anchor installation until approval of the contractor's qualifications and staff experience are given by the engineer. The engineer may suspend the ground anchor work if the contractor substitutes unqualified personnel for approved personnel during construction. If work is suspended due to the substitution of unqualified personnel, the adjustment in contract time resulting from the suspension of work will not be allowed.

A.3 Submittals

(1) Prepare and submit to the engineer for review and approval working drawings and a design submission describing the ground anchor system or systems intended for use. The working drawings and design submission must be submitted thirty business days before the commencement of the ground anchor work. The working drawing and design submission must include certificates of compliance for the following materials, if used. The certificates must state that the material or assemblies to be provided will fully comply with the requirements of the contract.

- Prestressing steel or bar;
- Portland cement;
- Prestressing hardware;
- Bearing plates.

(2) The engineer will approve or reject the contractor's submittals within 30 business days after receipt of the submission.

(3) Submit to the engineer for review and approval or rejection mill test reports for the prestressing steel and the bearing plate steel. The engineer may require the contractor to provide samples of any ground anchor material intended for use on the project. The engineer will approve or reject the prestressing steel and bearing plate steel within five

business days after receipt of the test reports. Do not incorporate the prestressing steel and bearing plates in the work without the engineer's approval.

(4) Submit to the engineer for review and approval or rejection calibration data for each test jack, pressure gauge and reference pressure gauge to be used. The engineer will approve or reject the calibration data within 5 business days after receipt of the data. Do not commence testing until the engineer has approved the jack, pressure gauge, and reference pressure gauge calibrations.

(5) Submit to the engineer within 10 calendar days after completion of the ground anchor work, a report containing the following information:

- As-Built plans showing the location and vertical and horizontal orientation of the tiebacks, capacity, tendon type, total length, and unbonded length as installed.
- Steel tendon, corrosion protection elements and grout certifications and/or mill reports.
- Grouting records indicating the following:
    1. Cement type;
    2. Cube test strength results;
    3. Grout volume for bonded and unbonded lengths;
    4. Grout pressure.
- Show on the as-built plans the type of testing performed for each post tieback.
- Tieback tests results (Performance and proof test data with load-anchor elongation curves).
- Other records as required by standard spec 106.

A.4 Definitions

(1) Anchorage Devices. The anchor head wedges or nuts, which grip the prestressing steel.

(2) Bearing Plate. The steel plate, which distributes the ground anchor force to the structure.

(3) Bond Length. The length of the ground anchor, which is bonded to the ground and transmits the tensile force to the soil or rock.

(4) Factored Design Load. The factored design load is the maximum anticipated factored load that will be applied to the ground anchor during its service life after stressing and testing have been completed. Design loads and applicable load factors are per AASHTO LRFD Bridge Design Specifications, Fifth Edition with 2010 Interim.

(5) Ground Anchor. A system, referred to as a tieback or an anchor, used to transfer tensile loads to soil or rock. A ground anchor includes all prestressing steel, anchorage devices, bearing plates, grout, coatings, corrosion protection, and sheathings and couplers if used.

(6) Minimum Specified Ultimate Tensile Strength. The minimum breaking strength of the prestressing steel as defined by the specified standard.

(7) Tendon Bond Length. The length of the tendon, which is bonded to the anchor grout.

(8) Total Anchor Length. The unbonded length plus the tendon bond length.

(9) Unbonded Length. The length of the tendon, which is not bonded to the grout. The grout surrounding the unbonded length is a void filler and provides corrosion protection.

B Materials

B.1 References

(1) **AASHTO Standards**

- M85 Portland Cement
- M183 Structural Steel
- M275 Threadbar Prestressing Steel
- M203 Seven-wire, low relaxation strands
- M222 High-Strength Low-alloy Structural Steel with 50,000 psi Minimum Yield Point to 4 Inches Thick
- M252 Corrugated Polyethylene Drainage Tubing

(2) **ASTM Standards**

- A-53 Specification for Steel Pipe
- A-252 Specification for Welded and Seamless Steel Pipe Files
- A-500 Specification for Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- A-722 Threadbar Prestressing Steel
- A-779 Compact Seven-wire, low relaxation strands
- D-1248 Specification for Welded and Seamless Steel Pipe Files
- D-1784 Specification for Rigid Poly Vinyl Chloride (PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) Compounds
- D-4101 Specification for Propylene Plastic Injection and Extrusion Materials

(3) **Post-Tensioning Institute Standards**

- "Guide Specification for Post-Tensioning Materials," Post-Tensioning Manual, Post Tensioning Institute, 6th Edition, 2006.
- "Specification for Unbonded Single Strand Tendons," Post-Tensioning Institute, 2nd Edition, 2003.
- "Recommendations for Prestressed Rock and Soil Anchors," Post-Tensioning Institute, 4th Edition, 2004.

B.2 Tieback Anchors

(1) Admixtures that control bleed, improve flowability, reduce water content, and retard set may be used in the grout subject to the approval of the engineer. Expansive admixtures may only be added to the grout used for filling sealed encapsulations, trumpets, and

anchorage covers. Accelerators are not permitted. Admixtures, if used, must be compatible with the prestressing steels and mixed in accordance to the manufacturer's recommendations.

(2) Fabricate exposed anchorage covers from steel or ductile cast iron with a minimum thickness of 0.10 inches. Securely attach the cover to the anchorage device or bearing plate. If the cover is to be grease filled, then the cover must form a permanent watertight enclosure for the anchorage device.

(3) Use anchorage devices capable of developing 95 percent of the minimum specified ultimate tensile strength of the prestressing steel tendon. The anchorage devices must conform to the static strength requirements of section 3.1.6 (1) and section 3.1.8 (1) of the PTI "Guide Specification for Post-Tensioning Materials".

(4) Fabricate the bearing plate from steel conforming to ASTM A572 Grade 50 or AASHTO M223 Grade 50 specifications.

(5) Fabricate the bondbreaker from a smooth plastic tube or pipe having the following properties:

- Resistant to chemical attack from aggressive environments, grout or grease.
- Resistant to aging by ultra-violet light.
- Fabricated from material nondetrimental to the tendon or bar.
- Capable of withstanding abrasion, impact, and bending during handling and installation.
- Enable the tendon to elongate during testing and stressing.
- Allow the tendon to remain unbonded after lock-off.

(6) Use Type I, II, or III Portland cement conforming to AASHTO M85 for grout. The corrosion inhibiting grease must conform to the requirements of section 3.2.5 of the PTI, "Specification for Unbonded Single Strand Tendons".

(7) Fabricate heat shrinkable tubes from a radiation crosslinked polyolefin tube internally coated with an adhesive sealant. Before shrinking, the tube must have a nominal wall thickness of 24 mils. The adhesive sealant inside the tube must have a nominal thickness of 20 mils.

(8) Fabricate ground anchor tendons from a single bar. Additionally, the ground anchor tendons must conform to the following:

- Steel bars conforming to AASHTO M275, or ASTM A722.
- Seven-wire, low relaxation strands conforming to M203.

(9) Use steel couplers capable of developing 95 percent of the minimum specified ultimate tensile strength of the tendon.

(10) Use a sheath as part of the corrosion protection system for the unbonded length portion of the tendon. Fabricate the sheath from one of the following:

- A polyethylene tube pulled or pushed over the prestressing steel. The polyethylene must be Type II, III, or IV as defined by ASTM D-1248 (or approved equal). The tubing must have a minimum wall thickness of 60 mils plus/minus 10 mils.
- A hot-melt extruded polypropylene tube. The polypropylene must be cell classification PP 210 B5554211 as defined by ASTM D-4101 (or approved equal). The tubing must have a minimum wall thickness of 60 mils plus/minus 10 mils.
- A hot-melt extruded polyethylene tube. The polyethylene must be high density Type III as defined by ASTM D-3350 and ASTM D1248 (or approved equal). The tubing must have a minimum wall thickness of 60 mils plus/minus 10 mils.
- Steel tubing conforming to ASTM A-500, minimum wall thickness of 0.20 inches.
- Steel pipe conforming to ASTM A-53, Schedule 40 minimum.
- Plastic pipe conforming to ASTM A-1185, Schedule 40 minimum.
- A corrugated tube conforming to the requirement of the tendon bond length encapsulation.

(11) Spacers must permit grout to freely flow up the drill hole. Fabricate spacers from plastic, steel, or material that is nondetrimental to the prestressing steel. Do not use wood. A combination centralizer-spacer may be used.

(12) Fabricate the trumpet used to provide a transition from the anchorage to the unbonded length corrosion protection from a steel pipe or tube conforming to the requirements of ASTM A-53 for pipe or ASTM A-500 for tubing. The trumpet must have a minimum wall thickness of 0.125 inches for diameters up to four inches and 0.20 inches for larger diameters.

(13) Use potable water for mixing grout.

(14) Fabricate tendons in accordance to the following specifications.

- The tendons may be either shop or field fabricated from prestressing steel and materials conforming to the requirements of the Materials subsection of these special provisions. Fabricate the tendon as shown on the approved working drawings.
- The cement grout cover must provide corrosion protection of the tendon.
- Position spacers so their center-to-center spacing does not exceed ten feet. In addition, locate the upper spacer a maximum of five feet from the top of the tendon bond length, and locate the lower spacer a maximum of five feet from the bottom of the tendon bond length.

- The minimum unbonded length of the bar tendon must be 15 feet or as indicated on the plans or the approved working drawings, whichever is greater. The unbonded length must extend a minimum of 5 feet beyond the critical failure surface measured from the lowest subgrade level from the back of the retaining wall in the soil mass being retained by the wall. If the entire drill hole (tendon bond length and unbonded length) is grouted in one operation, then for the corrosion protection of the unbonded length provide either a sheath completely filled with corrosion inhibiting grease or grout, or a heat shrinkable tube internally coated with an elastic adhesive. If grease is used under the sheath, make provisions to prevent the grease from escaping at the ends of the sheath. The grease must completely coat the tendon, fill the void between the tendon and the sheath, and fill the interstices between the wires of the seven-wire strands. Provide a transition between the bond length and the unbonded length corrosion protection as illustrated in the working drawings. If the sheath is grout filled, a separate bond breaker must be provided. The bond breaker must prevent the tendon from bonding to the grout surrounding the unbonded length. If a grease-filled sheath corrosion protection is provided and the drill hole above the bond length is grouted after the ground anchor has been locked off, then grout the tendon inside a second sheath.
- The total anchor length must not be less than the minimum length indicated on the plans or the approved working drawings.
- Size the bearing plates so that:
    1. The bending stresses in the plate do not exceed the yield strength of the steel when a load equal to 95 percent of the minimum specified ultimate tensile strength of the tendon is applied;
    2. The average bearing stress on the concrete does not exceed that recommended in section 3.1.7 of the PTI, “Guide Specification for Post-Tensioning Materials”.
- Weld the trumpet to the bearing plate. The trumpet must have an inside diameter equal to or larger than the hole in the bearing plate. The trumpet must be long enough to accommodate movements of the structure during testing and stressing. For strand tendons with encapsulation over the unbonded length, the trumpet must be long enough to enable the tendon to make a transition from the diameter of the tendon in the unbonded length to the diameter of the tendon at the anchorhead without damaging the encapsulation. Trumpets filled with corrosion-inhibiting grease must have a permanent Buna-N synthetic rubber or approved equal seal provided between the trumpet and the unbonded length corrosion protection. Trumpets filled with grout must have a temporary seal provided between the trumpet and the unbonded length corrosion protection or the trumpet must overlap the unbonded length corrosion protection by a minimum of one foot and fit tightly over the unbonded length corrosion protection.

(15) Damage to the prestressing steel because of abrasions, cuts, nicks, welds and weld splatter will be cause for rejection by the engineer. Protect the prestressing steel if welding is to be performed in the vicinity. Grounding of welding leads to the prestressing steel is forbidden. Protect the prestressing steel from dirt, rust or deleterious substances. If heavy corrosion or pitting is noted, the engineer will reject the affected tendons.

(16) Use care in handling and storing the tendons at the site. Before inserting a tendon in the drill hole, the contractor and the engineer will examine the tendon for damage to the encapsulation and the sheathing. If, in the opinion of the engineer, the smooth sheathing has been damaged, repair it with ultra high molecular weight polyethylene tape.

C Construction

C.1 Anchor Installation

C.1.1 General

(1) Unless otherwise directed, select the drilling method, pressure grouting, post grouting, the grouting procedure, and the grouting pressure used for the installation of the ground anchor.

C.1.2 Drilling Method

(1) Unless otherwise directed, the contractor may choose to utilize rotary drilling with casing, duplex or dual rotary drilling method, rotary drilling with stabilizing fluid, percussion drilling with casing, hollow stem auger drilling or driven casing provided that the anchor hole is maintained in a stable condition at all times, preventing collapse or excessive over-excavation of soils. Pervasive hole caving or ground loss problems must be repaired by grouting at the contractor's expense to prevent damage to the adjacent ground mass and supported structures.

(2) Use duplex drilling when drilling anchors in predominately granular soils, soils below the ground water table, or when directed by the engineer to use duplex drilling when other drilling methods do not produce satisfactory results.

(3) At the ground surface, locate the drill hole within twelve inches of the location shown on the plans or the approved working drawings. Locate the drill hole so the longitudinal axis of the drill hole and the longitudinal axis of the tendon are parallel. In particular, do not drill the ground anchor hole in a location that requires the tendon to be bent in order to enable the bearing plate to be connected to the supported structure. At the point of entry, the horizontal angle made by the ground anchor and the structure must be within plus/minus three degrees of a line drawn perpendicular to the plane of the structure unless otherwise shown on the plans or approved working drawings. Do not extend the ground anchors beyond the right-of-way or easement limits shown on the plans.

(4) The tendon must be inserted into the drill hole to the desired depth without difficulty. When the tendon cannot be completely inserted, remove the tendon from the drill hole and clean or redrill the hole to permit insertion. Do not drive or otherwise force partially inserted tendons into the hole.

C.1.3. Grouting Method

(1) Use a neat cement grout. The cement must not contain lumps or other indications of hydration. Admixtures, if used, must be mixed in accordance to the manufacturer's recommendations.

(2) Use grouting equipment that produces a grout free of lumps and undispersed cement. Use a positive displacement grout pump. The pump must be equipped with a pressure gauge in order to monitor grout pressures. The pressure gauge must be capable of measuring pressures of at least 150 psi or twice the actual grout pressures used by the contractor whichever is greater. The grouting equipment must be sized to enable the grout to be pumped in one continuous operation. The mixer must be capable of continuously agitating the grout.

(3) Inject the grout from the lowest point of the drill hole. The grout may be pumped through grout tubes, casing, hollow-stem-augers, or drill rods. The grout may be placed before or after insertion of the tendon. Record the quantity of the grout and record the grout pressures. The grout pressures and grout takes must be controlled to prevent uncontrolled heave or fracturing.

(4) The grout above the top of the bond length may be placed at the same time as the bond length grout but it may not be placed under pressure. The grout at the top of the drill hole must not contact the back of the structure or the bottom of the trumpet.

(5) Upon completion of grouting and post grouting, the grout tube may remain in the hole but it shall be filled with grout. Do not load the tendon for a minimum of three days after grouting.

C.2 Installation of Trumpet and Anchorage

(1) The corrosion protection surrounding the unbonded length of the tendon must extend up beyond the bottom seal of the trumpet or one foot into the trumpet if no trumpet seal is provided. If the protection does not extend beyond the seal or sufficiently far enough into the trumpet, extend the corrosion protection or lengthen the trumpet.

(2) The corrosion protection surrounding the unbonded length of the tendon must not contact the bearing plate or the anchor head during testing and stressing. If the protection is too long, trim the corrosion protection to prevent contact.

(3) Completely fill the trumpet with corrosion inhibiting grease or grout. Trumpet grease can be placed any time during construction. Place trumpet grout after the ground anchor has been tested and stressed. Demonstrate to the engineer that the procedures selected for placement of either grease or grout will produce a completely filled trumpet.

(4) Cover all anchorages permanently exposed to the atmosphere with a corrosion inhibiting grease-filled or grout-filled cover. Demonstrate to the engineer that the procedures selected for placement of either grease or grout will produce a completely filled cover.

C.3 Anchor Testing

C.3.1 General

(1) Test each ground anchor. Do not apply any load greater than 10 percent of the factored design load to the ground anchor prior to testing. The maximum test load must not exceed 80 percent of the minimum specified ultimate tensile strength of the tendon. The test load must be simultaneously applied to the entire tendon. Stressing of single elements of multi-element tendons is not permitted.

(2) Supply the following testing equipment:

- A dial gauge or veneer scale capable of measuring to 0.01 inches used to measure the ground anchor movement. The movement-measuring device must have a minimum travel equal to the theoretical elastic elongation of the total anchor length at the maximum test load and it must have adequate travel so the ground anchor movement may be measured without resetting the device.
- A hydraulic jack and pump used to apply the test load. The jack and a calibrated pressure gauge must be used to measure the applied load. The jack and pressure gauge must be calibrated as a unit by an independent firm. The calibration must have been performed within forty-five business days of the date submitted. Testing cannot commence until the engineer has approved the calibration. The pressure gauge must be graduated in 100-psi increments or less. The ram travel of the jack must not be less than the theoretical elastic elongation of the total anchor length at the maximum test load.
- A calibrated reference pressure gauge must also be kept at the site. Calibrate the reference gauge with the test jack and pressure gauge.
- Provide an electrical resistance load cell and readout for use when performing a creep test.
- Place the stressing equipment over the ground anchor tendon in such a manner that the jack, bearing plates, load cells and stressing anchorage are axially aligned with the tendon and the tendon is centered within the equipment.

C.3.2 Performance Tests

(1) Install and conduct the performance tests. The anchors for the performance test must be similar to the production anchors shown on the plans, and must be selected as directed by the engineer. Record the encountered soil information through the entire depth of drilling holes. Submit performance test results and soil information to the engineer for approval. If the tested anchor(s) fail(s) to pass the performance tests, at least five workdays shall be allowed for the engineer to evaluate the test anchor(s) and the soil condition. Additional performance tests may be required upon request from the engineer. The additional performance test(s), as required, and time for the engineer to evaluate the test anchor(s), will be included in the work and will not be paid for separately. Do not order material for production anchors until the approval of the performance test results are given.

(2) Conduct performance tests in accordance to the following procedures on five percent of the ground anchors or a minimum of three ground anchors per wall, whichever is greater. The engineer will select the ground anchors to be performance tested. Test the remaining ground anchors in accordance to the proof test procedures.

(3) Conduct performance tests by incrementally loading and unloading the ground anchor in accordance to the following schedule. Raise the load from one increment to another immediately after recording the ground anchor movement. Measure and record the ground anchor movement to the nearest 0.01 inches with respect to an independent fixed reference point at the alignment load and at each increment of load. Monitor the load with a pressure gauge. Place the reference pressure gauge in series with the pressure gauge during each performance test. If the load determined by the reference pressure gauge and the load determined by the pressure gauge differ by more than ten percent, recalibrate the jack, pressure gauge and reference pressure gauge at no expense to the department. At load increments other than the maximum test load, hold the load just long enough to obtain the movement reading.

(4) **Performance Test Schedule**

Load
AL
0.20 FDL*
AL
0.20 FDL
0.40 FDL*
AL
0.20 FDL
0.40 FDL
0.60 FDL*
AL
0.20 FDL
0.40 FDL
0.60 FDL
0.75 FDL
AL
0.20 FDL
0.40 FDL
0.60 FDL
0.75 FDL
1.00 FDL*
AL
0.20 FDL
0.40 FDL
0.60 FDL
0.75 FDL
0.90 FDL
1.15 FDL* (Max. test load)
Reduce to lock-off load – 0.60 FDL

Where, AL = Alignment Load
FDL = Factored Design Load for Tieback
* = Graph required

(5) Hold the maximum test load in a performance test for ten minutes. Repump the jack as necessary in order to maintain a constant load. Start the load-hold period as soon as the maximum test load is applied. Measure and record at 1, 2, 3, 4, 5, 6, and 10 minutes the ground anchor movement with respect to a fixed reference. If the ground anchor movement between one minute and ten minutes exceeds 0.04 inches, hold the maximum test load for an additional 50 minutes. If the load-hold period is extended, record the ground anchor movement at 15, 20, 25, 30, 45 and 60 minutes.

(6) Plot the ground anchor movement versus load for each load increment marked with an asterisk (*) in the performance test schedule and plot the residual movement of the tendon at each alignment load verses the highest previously applied load.

C.3.3 Proof Tests

(1) Perform the proof test by incrementally loading the ground anchor in accordance to the following schedule. Raise the load from one increment to another immediately after recording the ground anchor movement. Measure and record the ground anchor movement to the nearest 0.01 inches with respect to an independent fixed reference point at the alignment load and at each increment of load. Monitor the load with a pressure gauge. At load increments other than the maximum test load, hold the load just long enough to obtain the movement reading.

(2) Hold the maximum test load in a proof test for ten minutes. Repump the jack as necessary in order to maintain a constant load. Start the load-hold period as soon as the maximum test load is applied. Measure and record the ground anchor movement with respect to a fixed reference at 1, 2, 3, 4, 5, 6, and 10 minutes. If the ground anchor movement between 1 minute and 10 minutes exceeds 0.04 inches, hold the maximum test load for an additional 50 minutes. If the load-hold period is extended, record the ground anchor movements at 15, 20, 25, 30, 45 and 60 minutes.

(3) **Proof Test Schedule**

Load
AL
0.20 FDL
0.40 FDL
0.60 FDL
0.75 FDL
1.00 FDL
1.15 FDL (Max. test load)
Reduce to lock-off load – 0.60 FDL

Where, AL = Alignment Load
FDL = Factored Design Load for Tieback

(4) Plot the ground anchor movement versus load for each load increment in the proof test.

(5) Submit proof tests for review by the engineer within 7 days of testing.

C.3.4 Ground Anchor Load Test Acceptance Criteria

(1) A performance- or proof-tested ground anchor with a 10-minute load-hold period is acceptable if the:

- The tieback resists the maximum test load with less than 0.04-inches of movement between 1 minute and 10 minutes.
- The total elastic movement of the tendon measured at the anchor head obtained from a proof or performance test must exceed 80 percent of the theoretical elastic elongation of the stressing or unbonded length for load increments 0.25 DL and above.
- The total movement of tendon must not exceed 100 percent of the theoretical elastic elongation of the unsupported length plus 50 percent of the supported length.

(2) A performance- or proof-tested ground anchor with a 60-minute load-hold period or a creep-tested ground anchor is acceptable if the:

- Ground anchor carries the maximum test load with a creep rate that does not exceed 0.08 inches/log cycle of time; and
- Total movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.

(3) If the total movement of the ground anchors at the maximum test load does not exceed 80 percent of the theoretical elastic elongation of the unbonded length, replace the ground anchor at no additional cost to the department.

(4) Ground anchors that have a creep rate greater than 0.08-inches/log cycle of time can be incorporated in the finished work at a load equal to one-half its failure load. The failure load is the load carried by the ground anchor after the load has been allowed to stabilize for ten minutes.

(5) When a ground anchor fails, modify the design and/or the construction procedures. These modifications may include, but are not limited to, installing replacement ground anchors, reducing the factored design load by increasing the number of ground anchors, modifying the installation methods, increasing the bond length or changing the ground anchor type. Any modifications of design or construction procedures including installing additional anchors shall be at the contractor's expense and at no additional charge to the department.

(6) Upon completion of the test, reduce the load to the lock-off load indicated on the plans and transfer the load to the anchorage device. The ground anchor may be completely unloaded prior to lock off. After transferring the load and before removing the jack,

record a lift-off reading. The lift-off reading must be within ten percent of the specified lock-off load. If the load is not within ten percent of the specified lock-off load, reset the anchorage and record another lift-off reading. Repeat this process until the desired lock-off load is obtained.

D Measurement

(1) The department will measure Tieback Anchors by each individual tieback anchor acceptably completed that are capable of carrying the load specified on the plans, which includes a proof test of each anchor.

(2) The department will measure Tieback Anchor Performance Tests by each individual performance test, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4150	Tieback Anchors	Each
SPV.0060.4155	Tieback Anchor Performance Tests	Each

Payment is full compensation for drilling; grouting; furnishing all steel, bearing plates and corrosion-protection materials required; tensioning; testing; and for designing and providing additional or remediation anchors for failed ground anchors.

258. Drilled Foundation Shaft Base Grouting, Item SPV.0060.4160.

A Description

This special provision describes furnishing all materials and labor necessary to perform base grouting of drilled shafts as shown in the plans or as directed by the engineer. The base grouting will include grouting of test drilled shafts and production drilled shafts. The test shafts will be base grouted prior to production shaft grouting to confirm the grouting procedure.

The base grouting subcontractor shall be prequalified along with the drilled shaft specialty contractor as one team. The base grouting subcontractor and the specialist shall have documented experience of successfully performing base grouting of drilled shaft tips on at least three similar projects in the last five years. The base grouting specialist can be a direct employee of the drilled shaft contractor or from an independent company.

The contractor shall submit a base grouting plan a minimum of 30 days prior to the drilled shaft construction. The base grouting plan shall be approved before drilled shaft construction begins. The plan shall at least address grout system details including plans of the rubber-sleeved ports, grouting equipment and backup, grout mix requirements, grouting procedures, monitoring procedures, termination criteria specified in paragraph C.2 including minimum grout volume to be calculated by the contractor using given equation, and contingency plans.

The contractor shall provide a minimum of 30 days notice to the engineer before the construction of drilled shaft to be base grouted begins.

B Materials

The base grouting specialty subcontractor shall supply all materials, personnel and equipment as described below and as required by the contractor to adequately perform base grouting. Such materials and equipment include:

- A grouting pump capable of supplying 800 psi of grout pressure to the tip of the base grouted shafts. The grout pump shall be a piston pump with at least 4 pistons and rated for a maximum pressure of 800 psi. The grout pump shall be equipped with a pressure gage capable of being monitored by the engineer. The pump must be serviced within the last 3 months or brand new, and be able to supply a continuous flow of grout.

- Grout plant with a minimum capacity of 10 cubic feet (300 liters). The plant shall be equipped with a colloidal mixer and an agitated holding tank.

- Grout cell (grout plate assembly) in sleeve-ports type (tube-a-manchette) with a steel plate and necessary accessories for installation.

- Three dial gauges with accuracy of 0.001 inches, manual readout, and minimum plunger length of 2 inches.

- Grout volume measurement equipment with manual readout.

- Survey level capable of reading to 0.001 feet (0.3 mm).

- Grout

  Grout shall consist of Type I-II Portland cement and water with a water cement ratio of 0.5 and an allowable range of 0.45 to 0.5 for shaft tip in clay and 0.4 to 0.6 for shaft tip in sand. NO SAND MIXES CAN BE USED. The grout shall be mixed thoroughly with a high efficiency mixer capable of producing a semi-colloidal suspension. A mixer assembly capable of mixing, holding, and pumping is recommended. The grout cube strength shall be at least 2500 psi after 28 days using "ASTM-C109/C109M-98 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2 in or 50 mm cube specimens)."

  The base grouting subcontractor is responsible for developing a grout mix with adequate working life (set time) at the anticipated grout pressures and temperatures and compatible with the proposed grouting equipment. The use of set retarders or other additives in the grout mix to achieve this is permitted. The mix shall conform to the minimum compressive strength requirements given above.

- Grout Tubes
  The grout tubes shall have a minimum inner diameter of 1 inch and be made of SCH 80 PVC pipe. Sections of pipe shall be joined with SCH 80 PVC couplings. Alternatively, base grouting can be performed through the CSL tubes. If CSL tubes are used, the requirements for grout tubes shall be also applied to these CSL tubes. All grout tube joints within the top ten feet of the shaft shall be prepared by sanding and priming prior to gluing. The grout tubes should extend approximately 5 feet above the top of the shaft or ground surface elevation (whichever is higher) and terminated with an NPT Male threaded fitting with cap. A minimum of eight grout tubes (four runs of two tubes) shall be installed in each shaft equally spaced within the reinforcing cage. The rubber sleeved ports shall be spaced at 12 to 15 inches on center. All supply lines and hoses shall be rated for at least 800 psi.

- Potable fresh water, 1" supply line and pump.

- Reference beams and the necessary supports. Reference beams shall be sufficiently stiff to support the instrumentation such that excessive variations in readings do not occur and cross connected to provide additional rigidity.

- A generator capable of 11 kW continuous and 30 kW peak of three-phase electric power for operating the electric grout pump.

Redundant base grouting equipment must be provided and present in proximity to the site to mitigate risk and minimize downtime in the event of grouting equipment malfunction or break down. If approved by the engineer, in lieu of a redundant grout pump, a redundant water pump to flush the grout lines in the event of grout pump or grout equipment malfunction or failure is acceptable.

C Construction

C.1 Preparation for Base Grouting

The Contactor shall notify engineer of the shaft installation and base grouting schedule 30 days prior to commencing of shaft installation. Construction of base grouting Drilled Shaft Foundations is identical to conventional drilled shaft construction with the following exceptions: the installation of grout tubes and grout cells; reinforcing cage placed in soft contact with the bottom of the excavation; and the base grouting procedure.

Grout tubes shall be installed in the reinforcing cage at the time of cage construction. They shall be installed from the tip of shaft extending approximately 5 feet above the shaft top. This shall include providing and installing threaded male adapters on the top of each tube. They shall be securely fastened at a maximum of five-foot intervals along the cage, with the exception of the bottom ten feet to allow for grout cell installation.

Grout cells shall be installed following cage erection. The reinforcing cage shall be lowered onto the grout cell after cage erection in order to minimize cell damage from cage racking. The lower ten feet of the grout tubes (previously left unrestrained) shall be

aligned with the grout cell slip tube connections and secured to the reinforcing cage. Supplemental grout cell restraints shall be furnished by the grout cell provider and firmly affixed to the reinforcing cage.

When installing the reinforcing cage in the excavation, it shall be lowered until coming into soft contact with the bottom of the excavation. Full weight of the reinforcing cage shall be top supported and shall not be applied to grout cell to minimize potential cell damage and prevent inadvertent cage buckling and / or poor cage alignment.

If the base grouting subcontractor wants to utilize a poorly graded aggregate with no fines (no material passing a No. 200 sieve) in the grout cell for grout distribution and the engineer approves this approach, the aggregate will need to be placed after the shaft is excavated and cleaned out. The aggregate will take space within the grout cell and the required minimum net grout volume will need to be adjusted.

Base grouting procedures (detailed below) can commence upon adequate drilled shaft concrete strength development, as directed by the engineer.

C.2 Procedure for Base Grouting

The base grouting specialty subcontractor shall perform the base grouting process in general accordance with the following steps.

- Access to the top of the shaft must be made available for surveying, access to grouting tubes and other required instrumentation.

- Preparation for grouting as specified.

- The upward movement of the drilled shaft must be monitored at three points around the shaft diameter at 120 degrees (plan view), with two redundant methods (surveyor level and dial gauges). Survey and record the shaft top elevation to a benchmark. Install three dial gauges mounted on reference beams with supports located at least 3 shaft diameters (clear distance) away from the shaft.

- Using the grout pump, fill pump reservoir with water and flush pump lines and the access lines to the shaft simultaneously until residual drilling fluid is expelled from all shaft access lines and clear water is returned. Each access line shall be fitted with a sacrificial in-line valve capable of sustaining the design grout pressure.

- Connect grout tubes to grout pump and pump grout continuously until one of the following production base grouting criteria is met. The minimum net volume must be pumped to the base before the maximum grouting pressure is achieved. This shall assure that an artificial pressure is not induced by access line blockage.

The base grouting shall be terminated once one of the following criteria is met:

- All of the following vertical movement, maximum grouting pressure, and the minimum net grout volume are achieved. If the vertical movement, maximum grouting pressure and the minimum net grout volume are not all achieved, then a subsequent stage of grouting must be performed.

Maximum Base Grouting Pressure (psi)	See the Plans
Minimum Net Grout Volume (ft^3)	Equals the volume of the grout cell as the minimum net grout volume. If poorly graded aggregate with no fines is used in the grout cell, the minimum grout volume shall be reduced by the volume of the aggregate.
Minimum Upward Movement (inch)	0.125

2. Maximum shaft upward movement of 0.40 inches is achieved regardless of the grouting pressure.

3. Grouting pressure reaches the maximum rating of the pressure grouting equipment and lines.

Grout pressure and shaft top vertical displacement by survey and dial gauges shall be monitored continuously throughout the grout process by the base grouting subcontractor. Grout volume shall be measured manually every minute. The contractor shall stop the grout process immediately when the base grouting reaches the production base grouting criteria as specified above. Upon termination, line pressure shall be safely vented and the valves removed or left open so as to not retain pressure within the grout cell during curing.

The grout pressure and the rate of pressure increase with respect to grout take must be monitored and recorded. For a sleeve port base grouting system, reduction in the ratio of pressure increase to the grout volume indicates possible hydro-fracturing, which is not desired. Therefore, maximum grouting pressure shall be achieved without pumping excessive amounts of grout.

Upon completion and throughout the base grouting process the shaft top elevation shall be surveyed by the base grouting specialty subcontractor.

If either the net grout volume or the upward movement of 0.125 inches is not achieved and as directed by the engineer, the grout lines shall be flushed and the contractor shall repeat the base grouting process at least 4 and no more than 6 hours after the first base grouting has been completed. As directed by the engineer, up to 2 cycles of base grouting including the initial base grouting cycle, shall be performed if the specified termination criterion is not achieved.

C.3 Survey Level
As a check on the shaft movement, the elevations of three points at the top of the shaft shall be determined by survey level before, during, and after the pressure grouting. This shall be performed by the base grouting specialty subcontractor. Alternatively, the surveyor may also use dial gages attached to a fixed reference near the top of the shaft. The initial elevation shall be determined before the application of the grout. A final reading shall be made at the time of the grout pressure reach the design pressure or as directed by the engineer.

C.4 Grout Feasibility Test
Grout feasibility test is not required.

C.5 Acceptance Criteria:
The base grouting is accepted when one of the termination criteria (specified in Section C2) is met or two cycles of base grouting is performed per shaft location.

C.6 Required Reports:
The report shall include field inspection forms, a description of the grout system, grout mix, the acceptance criteria met, plots of grout pressure and grout volume versus time, maximum upward displacement of the shaft, maximum grouting pressure, and summary conclusions. Provide six hard copies and one electronic copy of the report to the engineer.

D Measurement
The department will measure Drilled Foundation Shaft Base Grouting including up to two cycles of base grouting as each unit per shaft location, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4160	Drilled Foundation Shaft Base Grouting	Each

Payment is full compensation for furnishing all materials, providing all tools, equipment, cycles of base grouting, labor and incidentals.

259. Thermal Integrity Profiler (TIP) Testing, Drilled Foundation Shaft 78.74-Inch, Item SPV.0060.4170; Thermal Integrity Profiler (TIP) Testing, Drilled Foundation Shaft 98.43-Inch, Item SPV.0060.4171; Thermal Integrity Profiler (TIP) Testing, Wall Secant Pile 47.24-Inch, Item SPV.0060.4175.

A Description
A.1 General
This special provision describes providing specialized equipment and trained testing personnel and to perform Thermal Integrity Profiler (TIP) testing of drilled shafts in accordance to the plans and as hereinafter provided.

Thermal Integrity Profiler (TIP) testing records temperature of curing concrete (hydration energy) along the length of a drilled shaft to assess the quality of drilled foundation shafts or drilled secant pile wall shafts hereinafter referred to as "drilled shafts". Data will be acquired using Thermal Wires^{TM}, hereinafter referred to as "thermal wires", tied to the reinforcement bar cage and installed prior to concreting. The expected temperature at any location is dependent on the shaft diameter, mix design, time of measurement and distance to the center of the shaft. TIP measurements are used to estimate the shape of the shaft along the length of the shaft. These estimates are compared with concreting logs to assess the overall quality of the shaft.

TIP testing can be performed using embedded thermal wires or using probes lowered into embedded tubes. This special provision specifies the thermal wire method.

A.1 TIP Testing Personnel Requirements

The contractor shall provide a TIP testing expert to direct and perform all aspects of the TIP testing and provide interpretation of results. The TIP testing expert must be a professional engineer licensed in the State of Wisconsin. The TIP testing expert shall be employed by an independent testing agency with documented and approved experience in TIP testing. Submit the qualifications of the proposed TIP testing expert to the engineer for approval prior to beginning drilled shaft installation.

B Materials

Provide a TIP testing data acquisition system consisting of multiple thermal wires embedded in the drilled shaft concrete to be TIP tested and connected to a computer based data recorder. The data collection system shall be capable of automatically collecting temperature verses time after casting data along the length of the drilled shaft at intervals of 15 minutes. The thermal wires and TIP testing data acquisition system shall be as manufactured by:

Pile Dynamics Incorporated
30725 Aurora Road
Cleveland Ohio 44139
Phone: (216) 831-6131
Web Page: www.pile.com

C Construction

C.1 TIP Testing Coordination

Schedule and coordinate drilled shaft construction with the TIP testing expert. Alter normal construction procedures as necessary to facilitate the TIP testing procedure. This includes providing suitable and safe access to the site and specific locations of drilled shafts to be tested and providing assistance to the TIP expert to facilitate the TIP testing.

C.2 Thermal Wire Installation

(1) Install thermal wires as shown in the plans and in accordance to the procedures and recommendations of the TIP expert. For the initial installation of thermal wires on the contract, the TIP expert shall be on site to provide guidance and training on the installation and hookup of the thermal wires.

(2) For the drilled shafts indicated on the plans to be TIP tested, the contractor shall install the number of thermal wires that is equal to or greater than the shaft diameter. For example a drilled shaft diameter of 4.5 feet shall have minimum 5 thermal wires evenly spaced around the perimeter of the reinforcement cage and as shown in the plans. The minimum number of thermal wires for any shaft diameter shall be 4.

(3) Align and attach the thermal wires to the main longitudinal reinforcement of the drilled shaft spaced approximately equally around the perimeter of the drilled shaft reinforcement cage. Stretch the thermal wires to minimize the wire slack and tie vertically at a maximum of every 3 feet to the main longitudinal reinforcement. Locate the thermal wire on the main longitudinal reinforcement bar such that it is 90^{o} to the line connecting the reinforcement to the center of the shaft.

(4) Provide and install one additional thermal wire supported and attached to a longitudinal reinforcement bar positioned parallel to and offset from the perimeter reinforcement at a fixed and known radial distance closer to the center of the shaft; typically at least 2 inches or as shown in the plans. Record the offset distance to the closet perimeter thermal wire before placing the reinforcement bar cage into the drilled shaft.

C.2. TIP Testing

The contractor shall connect the thermal wires to a Thermal Access Port (TAP) prior to or immediately following drilled shaft concrete placement. The exact timing and duration of data measurement will be determined by the contractor's TIP testing expert. Data shall be collected at time intervals of 15 minutes for the duration of time sufficient to reach and record the peak heat of hydration temperature, but for a minimum of 24 hours or longer minimum duration as recommended by the TIP expert. After completion of the data collection period, the TAP shall be connected to the main TIP data acquisition unit and the data files shall be downloaded for inspection and evaluation of temperatures versus time for depth along the length of the drilled shaft.

Potential local defects indicated by locally low temperatures relative to the average temperature at that depth, or average temperatures significantly lower than the average temperatures at other depths, shall be immediately reported to the engineer.

C.3. TIP Testing Reports

Within three working days of completion of TIP testing and receipt of shaft construction record, submit a TIP Testing Report for each drilled shaft tested to the engineer summarizing TIP testing results. At a minimum the TIP testing reports must include:

(1) Graphical displays of temperature measurements in each thermal wire versus depth at peak temperature.

(2) Indication of unusual temperatures, particularly significantly cooler local deviations of the average at any depth from the overall average over the entire length, in either probe or thermal wire measurements

(3) The overall average temperature at peak temperature. This temperature is proportional to the average radius computed from the actual total concrete volume installed. Radius at any point can then be determined from the temperature at that point compared to the overall average temperature.

(4) A depiction of the shaft radius vs depth including the concrete cover at peak temperature. Variations in temperature between wires (at each depth) which in turn correspond to variations in cage alignment should be noted. The cage alignment or offset from center should be noted.

(5) Shaft specific construction information (e.g. elevations of the top of shaft, bottom of casing, bottom of shaft, etc.), should be noted on all pertinent graphical displays.

(6) Conclusions or recommendations concerning the acceptability of the drilled shaft based on the interpretation of the TIP testing results obtained.

D Measurement

The department will measure Thermal Integrity Profiler (TIP) Testing by the unit for each drilled shaft tested, acceptably completed, regardless of the number of thermal wire strings in the shaft.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4170	Thermal Integrity Profiler (TIP) Testing, Drilled Foundation Shaft 78.74-Inch	Each
SPV.0060.4171	Thermal Integrity Profiler (TIP) Testing, Drilled Foundation Shaft 98.43-Inch	Each
SPV.0060.4175	Thermal Integrity Profiler (TIP) Testing, Wall Secant Pile 47.24-Inch	Each

Payment will be full compensation for furnishing and installing the thermal wires, data collection unit, evaluation and interpretation of results, providing test reports.

260. Precast Beams, Item SPV.0060.4180.

A Description

This special provision describes fabricating, furnishing, transporting and erecting the precast concrete beams in accordance to the plans, the standard specifications, and as hereinafter provided.

B Materials

B.1 General

Provide precast beams that conform to the details shown on the plans.

Furnish steel reinforcement conforming to standard spec 505

Furnish Grade A-FA, A-S, A-T, A-IS, or A-IP air-entrained concrete conforming to standard spec 501.

B.2 Plant Certification

Obtain all precast concrete beams from fabrication plants that comply with the department's plant certification program in conformance with standard spec 106.3.3.3.1.

C Construction

C.1 Placing Concrete

Handle and place the concrete as specified in standard spec 502, except as stated below.

Place and consolidate concrete in lifts in a way that prevents segregation, provides uniform consolidation throughout the member, and minimizes visible lift lines and dried concrete deposits along formed surfaces.

Consolidate the concrete by internal, external, or both internal and external vibration. Avoid displacing reinforcing, conduits, or wires. Ensure that concrete is free from honeycombing throughout the member, free from voids around reinforcement and inserts, and free from excessive bug holing along formed surfaces.

C.2 Curing

Steam cure the precast beams in a manner similar to those used to cure prestressed girders as specified in standard spec 503.3.2.2. Curing should continue until the concrete develops the required compressive strength specified on the plans. Strength shall be determined by test cylinders cured with the represented precast beams. Ensure that at least two cylinders have strengths above the minimum specified required strength.

C.3 Surface Finish

Provide a sack rubbed finish on the exposed surfaces of the precast beams as specified in standard spec 502.3.7.5 before shipping from the plant. Provide a wire brush or stiff broom finish on surfaces to be bonded. Provide a smooth trowelled finish on the top surface of the beams, except for the bonding region in the center of the beam.

After the sack rubbed finish adequately cures, apply engineer-approved gray-pigmented concrete sealer for non-trafficked surfaces uniformly to all sack rubbed and smooth trowelled surfaces using the manufacturer's recommended rate and procedures. Apply sealer and allow adequate time for sealer to dry before shipping concrete members from the plant. Do not apply sealer to the faces of the beams that will receive concrete stain (bottom and outside faces).

C.4 Transportation, Storage, and Erection
Handle, store, and erect precast beams in a way that prevents cracking or other damage to the beams. Discard and replace units damaged by improper handling or storing.

D Measurement
The department will measure Precast Beams by each individual precast beam, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4180	Precast Beams	Each

Payment is full compensation for furnishing all materials; manufacturing; transporting; placing precast beams.

261. Concrete Polymer Pull Box, Item SPV.0060.4190.

A Description
This special provision describes furnishing and installing Polymer Concrete Pull Boxes for traffic signals or street lighting as shown on the plans.

B Materials
Pull boxes shall be constructed of polymer concrete consisting of sand and aggregate bound together with a polymer resin. Internal reinforcement may be provided by means of steel, fiberglass, or a combination of the two. The use of chopped fiberglass strands applied with a "chopper gun" or the use of high density polyethylene or high density polystyrene is prohibited. To assure consistent production from part to part, only matched metal tooling is to be used to manufacture the product. The material is to have the following minimum allowable properties to be accepted for use:

1. Unreinforced polymer concrete compressive strength: 10,000 psi tested in accordance to ASTM D-790.

2. Fiberglass reinforced polymer flexural strength: 18,000 psi tested in accordance to ASTM D-790.

3. Fiberglass reinforced polymer concrete flexural strength: 2,300 psi tested in accordance to ASTM D-790.

4. Fiberglass reinforced polymer tensile strength: 12,000 psi tested in accordance to ASTM D-638.

5. Accelerated service: 90% weight and strength retention when tested in accordance to ASTM D-756.

6. Water absorption: less than 1% weight increase when tested in accordance to ASTM D-570, sections 5, 6.1, and 6.5.

7. Cover impact resistance: 72 foot-pounds when tested using a C-tup in accordance to ASTM D-2444.

8. Cover skid resistance: 0.50 coefficient of friction when tested in accordance to ASTM C-1028.

9. Flammability test: UL94-0 rating.

10. Ultraviolet exposure: less than 1% loss in strength or weight when tested for 2,000 hours in accordance to ASTM G-154 using an U.V.A. 340 bulb.

11. Chemical resistance: less than 2% weight change when tested in accordance to ASTM D-543, section 7, Procedure 1 using the following chemicals:

    a) Sodium chloride, 5%
    b) Sodium carbonate, 0.1N
    c) Hydrochloric acid, 0.2N
    d) Acetic acid, 5%
    e) Sulfuric acid, 0.1N
    f) Sodium sulfate, 0.1N
    g) Sodium hydroxide, 0.1N
    h) Kerosene per ASTM D-543
    i) Transformer oil per ASTM D-543

12. Appearance: The vaults and covers shall be gray in color and shall be sized as shown in the plans. Provisions for inserting conduit into any side or the bottom of the vault shall be included. Conduit access areas of the box shall be capable of being readily cut in the field using a carbide hole saw with a battery-operated drill. Covers shall be heavy duty rated and shall be provided with two stainless steel tamper-resistant bolts. The box shall be equipped with a self-centering nut with a vertical hole through for debris removal. Each cover shall have the words “STREET LIGHTING” cast into its surface along the longest dimension. The words shall be permanently recessed into the surface.

13. Testing**:** The installed vault shall be rated for a minimum wheel load of 8,000 lbs and used in occasional, non-deliberate vehicular traffic or pedestrian traffic applications only. Qualification of an acceptable product is determined by applying the following test procedures.

13.1 Horizontal Sidewall Cyclic Test: Apply 800 psf uniformly to the entire area of the largest sidewall. Use an air bag to obtain uniform distribution. Support the opposite sidewall to prevent local failure. Deflection shall not exceed 1/4-inch per foot of wall length. Cycle the load ten times. Final test: Apply 1200 psf for one cycle to enclosure as described in Cyclic Test.

13.2 Vertical Box Wall Cyclic Test: Apply 8,000 lbs to a 10 inch by 10 inch by 1-inch thick steel load plate centered on the longest box wall so as to load a 5 inch by 10 inch area. A 1/2-inch thick rubber pad is to be placed between cover and load plate to ensure load distribution. Cycle load ten times. Final test: Apply 17,000 lbs for one cycle to enclosure as described in Cyclic Test. Maximum cover deflection = 1/2-inch at a load of 8,000 lbs maximum deflection.

13.3 Vertical Cover Cyclic Test: Apply 8,000 lbs to the center of the cover with a 10 inch by 10 inch by 1-inch thick steel load plate. A 1/2-inch thick rubber pad is to be placed between cover and load plate to ensure load distribution. Cycle load ten times. Final test: Apply 17,000 lbs for one cycle to enclosure as described in Cyclic Test. Maximum deflection = 1/2-inch at a load of 8,000 lbs measured at the location of maximum deflection.

All cyclic testing should be conducted with the load applied over a one minute period, held for one minute, released over a one minute period, then allowed to relax for one minute before proceeding to the next cycle. Failure is defined for all load tests as the specimen's inability to withstand an increase in load or the load at which the maximum allowable deflection is exceeded.

C Construction

Polymer Concrete Pull Box shall be installed in accordance to plan details.

D Measurement

The department will measure Concrete Polymer Pull Box by each individual polymer concrete pull box, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4190	Concrete Polymer Pull Box	Each

Payment is full compensation for furnishing and installing all materials; for drilling all holes for conduit connections; and for excavation, backfilling and disposal of surplus material.

262. Concrete Base Sleeves, Item SPV.0060.4195.

A Description

Furnish and install a corrugated steel pipe sleeve in the reinforced earth zone of mechanically stabilized earth (MSE) retaining walls and other locations shown in the plans. Perform work in accordance to pertinent portions of standard specs 520 and 521, the plans, and as herein after provided

B Materials

The concrete base pipe sleeve shall meet the requirements of standard spec 521.2 for corrugated steel pipe.

C Construction

Set the sleeve within 1 inch of the required position indicated on the plans prior to placing the reinforced earth. Brace the sleeve to maintain position within 2 inches of required position as backfilling proceeds. Place soil reinforcing mats around the sleeve.

For future reference, permanently indicate the depth measured from the top of the sleeve down to the level of the nearest MSE wall soil reinforcement on the inside surface of the sleeve, near the top of the sleeve..

Correct any damage to the sleeve that would hinder the installation of the concrete base prior to placing any additional reinforced earth.

D Measurement

The department will measure Concrete Base Sleeves by each individual unit, acceptably installed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.4195	Concrete Base Sleeves	Each

Payment is full compensation for furnishing and installing the concrete base sleeve.

263. Removing Hydrant, Item SPV.0060.5000; Install Hydrant, Item SPV.0060.5001; Ductile Iron Hydrant Branch 6-Inch, Item, SPV.0090.5003.

A Description

This special provision describes removing existing hydrants, installing new hydrants and 6" diameter hydrant branch alterations.

A.1 General

Perform work under these items in accordance to the details as shown on the plans and the requirements of the City of Milwaukee Water Main Installation Specifications, dated January 2, 1987 (City Water Main Specifications). Additionally, perform all work in accordance to the "Milwaukee Water Works Standard Plan Notes for Water Main Construction", June 14, 2011. Notes 4, 6, 15, 16, 17 and 21 shall not apply to this project. In case of conflicts between the City Water Main Specifications and the standard specifications or these special provisions, the requirements of the city standard specifications and the special provisions shall govern. Contact Mr. Bill Gehweiler, at (414) 286-2927 to purchase copies of the required documents.

B Materials

B.1 General

The city will furnish hydrants for installation on this project. Contact Mr. Ricardo Lopez, Inventory Clerk, at (414) 286-6123 for material supplies. Provide all other water main materials conforming to the latest version of the City of Milwaukee's Material Specifications. Material specifications can be found at the following website, http://city.milwaukee.gov/water/business/standardspecs.htm. All materials will require inspection by the City of Milwaukee. Notify Mr. Mark Scheller, (414) 286-2427 or Mr. Steve Brengosz, (414) 708-2808, for materials inspection and the City of Milwaukee's Construction Section, (414) 286-2497, for construction inspection, four working days prior to starting construction.

The contractor shall return all abandoned hydrants to the DPW Field Headquarters – Infrastructure, Operations, Water Works at 3850 N. 35th Street. Contact Mr. Ben Glatzel at (414) 708-2839 for additional information.

Milwaukee Water Works will test all pipe, in accordance to the City of Milwaukee Material Testing Specifications.

B.2 Valve Box Adapters

Install all valve boxes on gate valves with the use of valve box base adapters as detailed in the Standard Plan Notes Regarding Water Main Construction. Install the adapter in addition to the hardwood blocking.

C Construction

Unless shown otherwise, backfill all water main excavations with granular backfill as specified in Section 14 of the City of Milwaukee Standard Plan Notes Regarding Water Main Construction.

Consolidate all backfill by mechanical compaction per specification 2.6.14(B) of the Standard Specifications for Sewer and Water Construction in Wisconsin. Per specification, the initial compacted lift shall be 2 feet, and the specification shall be modified to read, "each subsequent compacted lift of material shall be 1 foot". Costs are to be included in the unit price bid for the water main. Settling the trench by flooding the backfill will not be allowed.

D Measurement

The department will measure Removing Hydrant as each individual hydrant, acceptably removed.

The department will measure Install Hydrant as each individual hydrant, acceptably installed.

The department will measure Ductile Iron Hydrant Branch 6-Inch by the linear foot of water main, and hydrant branch of the type and diameter specified, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5000	Removing Hydrant	Each
SPV.0060.5001	Install Hydrant	Each
SPV.0090.5003	Ductile Iron Hydrant Branch 6-inch	LF

Payment is full compensation for providing all materials (except hydrants provided by the city) including all valves, fittings, and accessories required; for furnishing all excavating, for sheeting and shoring; for forming foundation; for laying pipe; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for providing granular backfill material, including bedding material; for backfilling; for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

264. Connect Original Service (C.O.S.), Item SPV.0060.5002; Replace Original Service (R.O.S.), Item SPV.0060.5003; Roadway Service Box (R.S.B.), Item SPV.0060.5005.

A Description

This special provision describes installing a roadway service box and relocating a curb stop as shown on the plans.

A.1 General

Perform work under these items in accordance to the details as shown on the plans and the requirements of the City of Milwaukee Water Main Installation Specifications, dated January 2, 1987 (City Water Main Specifications). Additionally, perform all work in accordance to the "Milwaukee Water Works Standard Plan Notes for Water Main

Construction", June 14, 2011. Notes 4, 6, 16 through 18, and 21 shall not apply to this project. In case of conflicts between the City Water Main Specifications and the standard specifications or these special provisions, the requirements of the city standard specifications and the special provisions shall govern. Contact Ms. Angela Baldwin, at (414) 286-2813 to purchase copies of the required documents.

B Materials

B.1 General

The city will furnish curb stops and service boxes for installation on this project. The contractor shall furnish all fittings, adapters, piping and service insulators required for installation on this project to the latest version of the City of Milwaukee's Material Specifications. Material specifications can be found at the following website, http://city.milwaukee.gov/water/business/standardspecs.htm. All materials will require inspection by the City of Milwaukee. Notify Mr. Mark Scheller, (414) 286-2427 or Mr. Steve Brengosz, (414) 708-2808, for materials inspection and the City of Milwaukee's Construction Section, (414) 286-2497, for construction inspection, four working days prior to starting construction.

C Construction

When required and noted "C.O.S. on the plan(s), the contractor shall remove the service pipe from the old main and connect the service to the new main. The contractor shall furnish and install the copper service piping required to extend the service from the existing to the new main and all fittings required.

Where required and noted "R.O.S." on the plan(s), the contractor shall replace the original service with new copper water service piping of the same size, but not less than 1". The contractor shall furnish and install the copper service piping, corporation stop, and all fittings required. The contractor shall install a new curb stop with the required adapters and fittings in the existing water service piping. The new curb stop shall be set approximately 3 inches from the property line or 18 inches from the building face in the open street or as noted on the plan. The new copper water service shall extend from the new corporation stop at the water main to the new curb stop. The contractor shall abandon the existing piping no longer in service, remove the old service box and install a new service box with the new curb stop.

Where required and noted "R.S.B." on the plan(s), the contractor shall install a roadway service box by replacing the top section of the existing standard curb stop box with a top section of a standard valve box and cover furnished by the city.

The Milwaukee Water Works will shut off the water main to be altered and provide temporary hose connections to affected services as required.

The contractor will be responsible for all surveying required to layout and locate the water services.

D Measurement
The department will measure Connect Original Service (C.O.S.), Replace Original Service (R.O.S.), and Roadway Service Box (R.S.B.) as each individual unit, acceptably completed, including all construction parameters and requirements as described in this special provision.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5002	Connect Original Service (C.O.S.)	Each
SPV.0060.5003	Replace Original Service (R.O.S.)	Each
SPV.0060.5005	Roadway Service Box (R.S.B.)	Each

Payment is full compensation for providing all labor, tools, equipment, materials (except those provided by the city) and accessories required; for furnishing all surveying; for furnishing all excavating, for sheeting and shoring; for forming foundation; for sealing joints and making connections to new or existing facilities; for providing granular backfill material, including bedding material; for backfilling; for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

265. Adjusting Water Valves, Item SPV.0060.5004.

A Description
This special provision describes adjusting, protecting, and maintaining accessibility, for the duration of the paving project, to all city water service boxes and water gate valve boxes located within the project limits.

B Materials
All material for the adjustment of these facilities must meet City of Milwaukee specifications and will be provided by the City of Milwaukee by contacting Gil Taylor, Milwaukee Water Works, at (414) 708-9005, or Dave Goldapp, Milwaukee Water Works at (414) 286-6301. If there is contractor damage, the materials must still be provided by the City of Milwaukee, however, in this case, the contractor will be charged for all materials. Materials furnished by the City of Milwaukee and not used on the project shall be delivered back to DPW Field Headquarters- Infrastructure, Operations, Water Works at 3850 N. 35th Street. Materials being returned must be accompanied with a "surplus material" form completed by the Public Works Inspector assigned to the project.

C Construction
All water service boxes, water gate valve boxes within the project limits shall be adjusted to proposed elevations by the contractor using materials meeting city specifications.

The city will locate, mark, inspect and repair all water service boxes and water gate valve boxes within the limits of the project prior to commencement of work on the project.

Throughout the duration of the project, the contractor must ensure that all water service boxes and water gate valve boxes are adequately located and identified by blue paint, and that at all times, all water appurtenances remain accessible for operation by city forces. Exercise caution working adjacent to water facilities to avoid damage and ensure accessibility.

Upon completion of the contract, the city will inspect all water facilities to ensure the water valves are clean, properly aligned, and accessible. The contractor shall be responsible to make identified repairs and adjustments, and if any repairs or adjustments are made by the city, the cost will be charged to the contractor.

D Measurement

The department will measure Adjusting Water Valves as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5004	Adjusting Water Valves	Each

Payment is full compensation for furnishing all excavation, backfilling, disposal of surplus materials, water box, and restoration of the work site.

266. 72-inch Precast Valve Vault with 24-inch D.D. Gate Valve, Item SPV.0060.5007.

A Description

This work includes providing and installing resilient wedge gate valves at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 Resilient Wedge Gate Valves

City of Wauwatosa standard conforming to AWWA Standard C515 covering Resilient Seated Gate Valves for Water Supply Service, and be rated for 250 PSIG cold water working pressure.

The valves shall have a ductile iron body, bonnet, and stuffing box. The wedge shall be ductile iron and totally encapsulated with rubber.

The sealing rubber shall be permanently bonded to the wedge per ASTM D429.

Valves shall be supplied with 0-ring seals at all pressure retaining joints. No flat gaskets or conventional type packing shall be allowed on NRS valves.

The valves shall be non-rising stem, opening by turning clockwise, and provided with a 2" square operating nut.

Stems for NRS assemblies shall be copper alloy with integral collars in full compliance with AWWA. Stems shall operate with copper alloy stem nuts independent of wedge and of stem. NRS stems shall have two 0-rings located above thrust collar and two 0-rings below. Stem 0-rings above the thrust collar shall be replaceable with valve fully opened and subjected to full pressure. The stems shall also have one low-torque thrust bearing located above and one below the stem collar to reduce friction during operation.

The body, bonnet and stuffing box shall be fusion-bond epoxy coated, both interior and exterior. Epoxy shall be applied in accordance to AWWA C550 and be NSF 61 Certified.

Each valve shall have maker's name, pressure rating, and year in which it was manufactured cast in the body. Prior to shipment from the factory, each valve shall be tested by hydrostatic pressure equal to the requirements of AWWA C515.

Valves shall be provided with bevel gears (horizontal) or spur gears (vertical) as indicated.

All external bolting materials shall be stainless steel and have hexagonal heads.

All valves shall include CleanTrack™ Technology. CleanTrack™ consists of bronze rollers housed in a bronze scraper on the both sides of the wedge, traveling in a 316 stainless steel track.

Valves shall have component parts cast, machined, assembled, and tested in the USA and shall be Clow Valve, Oskaloosa, Iowa or equal.

B.2 Precast Concrete Water Valve Manhole

Precast Concrete Riser and Cone Section: In accordance to ASTM C478; minimum wall thickness of 7 inches for 72-inch diameter.

Precast Concrete Base Riser Section with Integral Floor: In accordance to ASTM C478, minimum thickness 8 inches; cast in place pipe sleeves.

Concrete Flat Slab Top: In accordance to ASTM C478 and approved Shop Drawings; equipped with lifting hooks.

Minimum Access Opening in Cone or Top Section: Sufficient to allow removal of valve.

Minimum Compressive Strength of Concrete: 4000 psi.

Section shall support own weight and live load equivalent to AASHTO HS-20 Highway Loading unless otherwise indicated on Drawings.

Design exterior wall for a minimum equivalent fluid pressure of 90 pounds per square foot and consider additional lateral pressure from approaching truck wheels.

Form and cast openings with wall sleeves in base sections as required by Drawings.

Section Joints: Tongue and groove.

Identification Markings: Clearly mark inside of each precast section indicating date of manufacture, name or trademark of manufacturer. Clearly mark vault identification number from Shop Drawings on outside of each section.

Precast concrete rings shall conform to ASTM C478.

B.3 Valve Manhole Steps

Steps: Steel reinforced copolymer polypropylene plastic ASTM D4101 PP0344B33534Z02; ASTM A615, Grade 60 steel reinforcing bar 1/2-inch diameter, form; size, placement, and embedment shall conform to OSHA 29 CFR 1926.1053 Ladders and ASTM C478; ends of legs tapered with fins for embedment.

Align steps in risers and cone section to form continuous ladder with rungs equally spaced vertically in assembled vault in accordance to OSHA 1910.27, Fixed Ladders.

B.4 Water Valve Manhole Frame and Cover

Manufacturers: Neenah Foundry Company, Neenah, WI.

Manhole Frame and Covers: Gray iron castings; ASTM A48, Class 35B, machined horizontal bearing surface, with concealed pickhole, gasketed, solid lid.

R-1900-E, or an approved equal; with word "WATER" cast in cover.

B.5 Polyethylene Sheeting for Pipe Corrosion Protection

Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, Color: Black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Furnish tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

C Construction

C.1 General

Excavate area of vault structure to depth required on Drawings.

Limit horizontal excavation to outside diameter of vault structure plus sufficient exterior clearance to allow a safe work area for installers.

Where ground water is present in bottom of vault excavation, remove water by pumping, maintain free of water, and place 12 inches of crushed stone as bedding for vault.

Set base section, align pipe sleeve openings to provide straight alignment of pipe through vault, and level and plumb section.

Set vault at a grade to assure that 8- 12 inches of precast concrete rings are required to bring vault frame and cover to final grade.

Place preformed flexible joint sealant on either side of tongue portion of joint in base section to assure filling of entire joint when assembled.

Set riser section on base, align joint prior to setting, and lower riser section level and uniformly on to base to squeeze joint compound throughout tongue and groove joint.

Joint compound shall be visible for inspection both interior and exterior to assure watertight fit. Trowel excess material flush at interior and exterior surface after placement.

Repeat process for remaining riser sections and top, exercising care to align ladder rungs to form uniform vertical ladder.

Sections shall be vertical and in true alignment with a maximum 1/4-inch tolerance per section allowed.

Allow joints to set for a minimum 24-hour period before backfilling.

Plug holes in sections required for handling or other purposes with a non-shrink grout, finished flush on inside.

Perform backfilling carefully, bringing fill up evenly on all sides.

Compact fill around vault mechanically.

Install external frame/manhole seal as manufactured by Adaptor, Inc. or equal.

C.2 Field Installation of Pipe Sleeves

If an additional pipe sleeve is required in base section due to changed conditions, provide hole in section prior to setting that section.

Core hole in section of sufficient diameter to accommodate pipe and pipe sleeve, using care not to crack or splay concrete.

Install Kor-N-Seal® type pipe sleeve in accordance to manufacturer's instructions.

C.3 Frame and Cover Installation
Set frame and precast concrete adjustment rings in a combination bed of flexible joint sealant and cement mortar.

Place flexible joint sealant on centerline circumference of slab top or concrete ring with mortar bed placed on interior and exterior of sealant to full width of frame or ring area.

Set ring or frame on top of bedding material, press down to bring flexible sealant in contact with top and bottom surface of slab top, ring, or frame, and level.

C.4 Pipe and Valve Installation
Extend water main pipe through pipe sleeves.

Extend a minimum of 2 full lengths of pipe out from centerline of valve vault in either direction.

Bring bedding material for pipe up to vault face.

Provide a poured concrete pedestal or solid masonry pipe support for valve, full width of structure and of a length to match valve barrel.

Provide and install 1/2-inch thick performed pipe filler between pipe and pedestal.

Set valve on pipe filler and concrete pedestal with valve operating nut positioned directly under center of vault cover.

Connect valve to water main in accordance to manufacturer's instruction, plumb and level valve, and assure uniform bearing of entire valve barrel on support.

D Measurement
The department will measure 72-Inch Precast Valve Vault with 24-Inch D.D. Gate Valve by each valve vault provided and installed, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5007	72-Inch Precast Valve Vault with 24-Inch D.D. Gate Valve	Each

Payment is full compensation for furnishing and installing all materials; fittings, precast structures, manhole castings, joint restraint, flushing, testing, concrete buttresses, shoring, temporary piling, traffic control, dewatering, excavating, backfilling, and compaction.

267. Permanent Connection to Existing 24-inch Water Main, Item SPV.0060.5008.

A Description

This special provision describes the connection of proposed water main to existing water main as shown on the plans. Perform this work in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), and as hereinafter provided and these special provisions.

B Materials

B.1 General

Furnish all fittings (restrained joint and standard) required for installation on this project. Unless specified otherwise, water main shall be Push-on Rubber Gasket Joint Ductile Iron. Water main specified as restrained joint, shall be Restrained Joint Ductile Iron Thickness Class 55 pipe, conforming to AWWA C-151 with fittings conforming to AWWA C110.

Contractor to provide all necessary information for furnished steel and iron items to comply with Wisconsin Department of Transportation DT2249, "Utility's Certificate of Compliance for Steel and Iron Items".

C Construction

Construct each cut in connection to existing 24-inch cast iron or concrete water main including spool pieces, fittings, material adaptor fittings, temporary plugs, air vents, excavation shoring, backfill, and restoration.

D Measurement

The department will measure Permanent Connection to Existing 24-inch Water Main as each connection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5008	Permanent Connection to Existing 24-inch Water Main	Each

Payment is full compensation for providing all labor, equipment, materials, fittings and accessories required; for furnishing all excavating; for sheeting and shoring; for forming foundation; for laying pipe; for removing valves; for installing all valves, air vents, and fittings; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for providing granular backfill material, including bedding material; for backfilling; for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

268. Temporary Connection to Existing 24-inch Water Main, Item SPV.0060.5009.

A Description

This special provision describes the connection of proposed water main to existing water main as shown on the plans. Perform this work in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), and as hereinafter provided and these special provisions.

B Materials

B.1 General

Furnish all fittings (restrained joint and standard) required for installation on this project. Unless specified otherwise, water main shall be Push-on Rubber Gasket Joint Ductile Iron. Water main specified as restrained joint, shall be Restrained Joint Ductile Iron Thickness Class 55 pipe, conforming to AWWA C-151 with fittings conforming to AWWA C110.

Contractor to provide all necessary information for furnished steel and iron items to comply with Wisconsin Department of Transportation DT2249, "Utility's Certificate of Compliance for Steel and Iron Items".

C Construction

Construct each live tap connection to existing 24-inch cast iron or concrete water main including SS tapping saddle and valve, excavation shoring, backfill, and restoration.

D Measurement

The department will measure Temporary Connection to Existing 24-inch Water Main as each connection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5009	Temporary Connection to Existing 24-inch Water Main	Each

Payment is full compensation for providing all labor, equipment, materials, fittings and accessories required; for furnishing all excavating; for sheeting and shoring; for forming foundation; for laying pipe; for removing valves; for installing all valves, air vents, and fittings; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for providing granular backfill material, including bedding material; for backfilling; for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

269. Ground Hydrant Assembly, Item SPV.0060.5010.

A Description

This work includes providing and installing new flush mount ground hydrants at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 New Ground Hydrant Assembly

Provide new water main hydrants and hydrant lead piping boxes meeting the requirements of the City of Wauwatosa.

Flush Type Fire Hydrants shall comply, where applicable, to AWWA Standard C-502, latest revision. Flush Type Fire Hydrants shall be of the compression type, with the main valve opening against the pressure and closing with the pressure. The main valve opening shall be 5 ¼" diameter. Flush Type Fire Hydrants shall be of a dry barrel design.

Flush Type Fire Hydrants shall be rated at 150 psi water working pressure, tested at 300 pounds hydrostatic for structural soundness in the following manner; 300 pound hydrostatic test supplied from the inlet side, first with the main valve closed for the testing of the valve seat; second, with the main valve open for testing of the drain valves and the hydrant barrel.

Auxiliary shut-off (isolation) gate valves shall be of the same manufacturer as the hydrant when required.

Hydrant Assembly shall include a cast iron box and cover for installation flush with grade level.

The hydrant box shall not be attached to the hydrant at any point thus prohibiting loads from being transferred to the hydrant, standpipe, or connecting pipe.

Hydrant box, when properly installed with cover shall withstand a 25,000 pound load. Hydrants shall have 2-2 ½" hose connections and 1-4 ½" nozzle.

B.2 Hydrant Lead Piping

Ductile iron (DI) piping shall be in accordance to AWWA C150, Class 55. Design pipe designed for rubber push-on gasket joints conforming to AWWA C111.

Cast in or stamp on pipe manufacturer's mark, year of production, and "DI" or "DUCTILE."

Pipe shall be cement mortar lined and have internal and external bituminous coats.

Hydrants shall be connected to the main by a 6" mechanical joint or flanged shoe. Mechanical joint shoes shall be fitted with strapping lugs.

B.3 Fittings
Fittings shall conform to AWWA C110, centrifugally cast in metal or sand-lined molds.

Use of compact fittings conforming to AWWA C153 is acceptable. In no case shall fitting grade rating less than adjoining pipe.

Fittings shall be from same manufacturer as pipe.

Join pipe and fittings by means of a push-on rubber gasket joints conforming to AWWA C111.

Nuts and bolts for joints and fittings shall be corrosion resistant steel, NSS Technologies, Inc., Cor-Blue or approved equal.

B.4 Polyethylene Sheeting for Pipe Corrosion Protection
Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, color black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105.

Provide tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

C Construction
C.1 General
In accordance to Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to “Diggers Hotline, Inc.” (800) 242-8511 not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

Before beginning excavation of trench, contractor shall uncover existing water main to which new hydrant tee and lead piping is to connect to verify line, grade and connection required.

C.2 Installation of Hydrant Assembly
Provide hydrants, hydrant lead valves, fittings, and branch T-connectors with independent support of minimum 16-Inch x 8-Inch x 4-Inch solid block or 3000 psi formed concrete pad.

Place crushed clear stone below base of hydrant to 6 inches above drain holes in hydrant stem.

Set hydrant plumb and centerline of hydrant vertical. Solidly buttress hydrant against trench wall.

Hydrants shall be constructed of ASTM A-126 Class B cast iron. The main valve of the hydrant shall be made of rubber.

The bottom stem threads of the main valve rods shall be fitted with a cap nut for sealing the threads away from the water.

Changes in size or shape of the waterway shall be accomplished by means of easy curves. Exclusive of the main valve opening, the net area of the waterway of the barrel and the foot piece at the smallest part shall not be less than 120% of that of the net opening of the main valve.

Hose and pumper caps shall be individually chained to the hydrant.

The operating threads of the hydrant shall be so designed as to avoid the working of any iron or steel parts against either iron or steel. The operating stem and operating nut threads shall be square or acme type.

Bonnet shall be weather proof, free draining, and of a type that will maintain the operating mechanism in readiness for use under freezing conditions.

The operating nut shall be provided with a convenient means to afford lubrication to ensure ease of operating and the prevention of wear and corrosion. Hydrants shall be of dry barrel type. Hydrant shoe shall have two positive acting non-corrodible drain valves that shall drain the hydrant completely by opening when the main valve is closed, and also to close tightly when the main valve is open.

All like parts of hydrants of the same size and model produced by the same manufacturer shall be inter-changeable.

Hydrants shall open by turning to the right.

Threads on hose and steamer nozzles shall be National Standard unless otherwise specified. Operating nuts and cap nuts shall conform to National Standard unless otherwise specified.

Bury shall be the measured depth from grade line to bottom of connecting pipe.

D Measurement

The department will measure Ground Hydrant Assembly by each individual hydrant assembly, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5010	Ground Hydrant Assembly	Each

Payment is full compensation for furnishing and installing all materials; excavating, backfilling, and compacting.

270. Adjusting Sanitary Manhole; Item SPV. 0060.5011.

A Description

This work includes adjusting sanitary manholes to an elevation as determined by the engineer as well as installing frame and cover, internal frame/chimney seal, in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW) and the "Special Provision Notes for Sanitary Sewer Work" as found in the plans.

Add or remove masonry adjusting rings as needed. This item applies to structures to be lowered less than 6 inches or raised less than 12 inches.

B Materials

B.1 Adjusting Rings

Adjustment rings shall be concrete with steel reinforcement in conformance with ASTM C-478. Precast concrete rings shall have an inside diameter to match the manhole opening, be not less than 2 inches nor more than 6 inches high, and have a wall thickness of 6 inches unless otherwise specified. The rings shall contain a minimum of one No. 2 reinforcing rod centered within the ring. Do not use any cracked or broken rings. The top of precast manhole cones shall be set a maximum of 18 inches lower than established grade in unimproved areas, with the top of the manhole cover being ringed up flush with the existing ground. The minimum number of adjusting rings shall be one 2-inch ring. The maximum height of adjusting rings shall be 8 inches in paved areas. All joints between the adjusting rings shall be filled with grout or mortar, including between the cone and the adjusting ring and the adjusting ring and the frame. Rings shall be grooved to receive a step.

B.2 Manhole

Precast manholes and cones shall conform to ASTM Specifications, C478, latest revision.

B.4 Manhole Seal

Furnish new Cretex, NPC Flexrib, or approved equal internal frame/chimney Seal, as shown in the plans. The seal shall meet the material requirements of section 8.42.3 and the performance requirements of section 8.42.4 of the SSSW.

C Construction

C.1 General

The location of existing sanitary manholes to be adjusted is indicated on the plans. Adjust these items as shown in the plans. Reconstruct manholes as necessary so that the frames and cover when placed will be at the established required grade; remove the existing frame

and cover. Install seals in accordance to the manufacturer's recommended installation procedures. Furnish and use Backfill Slurry in the manhole excavation area to existing surface or to appropriate depth for pavement restoration. Salvage the existing frame and cover.

C.2 Surface Preparation

Remove manhole cover and power wire brush the lower 3 inches of the manhole frame to remove any loose rust or scale and repair any imperfections by either grinding smooth or filling with mortar. A smooth, clean sealing surface is required. Realign the casting if it is offset more than approximately 2 inches from the chimney. Remove all loose and protruding mortar and brick from the upper 7-Inch chimney and clean surface by power wire brushing. Provide a 4-Inch wide sealing surface starting 2 inches down from the bottom of the frame.

All sealing surfaces must be circular, reasonably smooth, clean and free of any loose material or excessive voids. If such a surface does not exist for the bottom of the sleeve to seal against, use one-component, quick-set, high strength, non-shrink, polymer modified patching mortar which has been formulated for vertical or overhead use. If the bottom of the sleeve is to seal against the top of an eccentric (straight side) cone and an inadequately high vertical surface does not exist, contact the manufacturer to obtain details to build the required vertical surface.

Use caulk to fill minor irregularities in the bottom sealing surface. The caulk shall be a butyl rubber caulk conforming to AASHTO M-198, Type B. Apply a single bead of the caulk to the center portion of the lower sealing surface of the sleeve.

Any flaws in the manhole frame, such as minor cracks, pits or protrusions, shall be repaired by either filling with mortar or grinding smooth.

D Measurement

The department will measure Adjusting Sanitary Manhole as a unit per each adjustment, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5011	Adjusting Sanitary Manhole	Each

Payment is full compensation for furnishing and installing all materials including adjusting rings, masonry, and internal frame/chimney seals; for excavating, backfilling, and compacting; for disposing of surplus materials; and for cleaning out and restoring the structure.

271. Reconstruct Sanitary Manhole, Item SPV.0060.5013.

A Description

This work includes reconstructing a sanitary manhole to an elevation as determined by the engineer, in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), and as hereinafter provided.

B Materials

B.1 Manhole

Manhole barrel sections shall be constructed of precast reinforced concrete sections.

Precast manholes and tops shall conform to ASTM Specifications, C478, latest revision.

B.2 Manhole Seal

Sanitary manhole seal–internal/external, as shown in the construction details on the plans, shall meet the material requirements of section 8.42.3 and the performance requirements of section 8.42.4 of the SSSW.

B.3 Joints

Joints for precast manholes shall meet the requirements of ASTM C-443, latest revision, except that sealant shall be butyl rubber gasket or butyl rubber rope. Flexible butyl rubber gaskets or rope shall comply with the physical requirements for Type "B" gaskets in AASHTO Designation M-198, or Federal Specification SSS-00210-A, sealing compound, preformed plastic for expansion joints and pipe joints.

B.4 Steps

All manholes shall be provided with steps equally spaced vertically on center installed by the manufacturer as shown on the standard detail sheet. Steps shall be embedded into the riser or conical top section of the wall a minimum of 3 inches. Manhole steps shall be Type PS-2-BG as manufactured by M.A. Industries, Peachtree City, GA 30269; or equal. Provide certified test data that the steps are capable of withstanding an 800- pound vertical load without sustaining more than a 3/8-inch permanent set when tested in accordance to Section 10 of ASTM C 497.

B.5 Elastomeric Waterproofing Sealer

Elastomeric waterproofing membrane shall be a single component, bitumen-modified, moisture-curing polyurethane similar to TREMproof 60 as manufactured by Tremco, 10701 Shaker Blvd., Cleveland, Ohio 44104; Duramem V500 as manufactured by Pecora Corporation, 2601 Oakland Avenue, Garland, Texas 75040; Thiodeck C.F. as manufactured by Toch/Carboline Company, 350 Hanley Industrial Court, St. Louis, Missouri 63144; or equal.

B.6 Plastic Sheet

Plastic sheet shall be clear plastic, minimum 4 mils. thick, of length and width to cover elastomeric waterproofing sealer.

B.7 Granular Backfill
Granular backfill shall consist of hard durable particles or fragments of stone, gravel, or sand. Granular backfill shall conform to the following grading requirements:

GRADING REQUIREMENTS FOR GRANULAR BACKFILL

Sieve Sizes	Percent Passing by Weight
3 inches	100
2 inches	95 – 100
No. 4	35 - 60
No.	200 5 - 15

C Construction
C.1 General
Reconstruct manholes to conform to the detail on the standard detail sheet and in the locations shown in the plans.

Salvage and reinstall existing frames and covers.

C.2 Backfill
Backfill with granular backfill material. Place in suitable lifts not exceeding 8 inches loose depth and compact each lift to a minimum of 90 percent of maximum density as determined by AASHTO T 180. Compact with mechanical vibrating or impact tampers.

Remove all form materials and trash from the excavation before placing any backfill. Backfill around manholes only after the concrete has attained 2/3 of the specified compressive strength. Obtain the engineer's approval of concrete work and attained strength prior to backfilling. Backfill shall be brought up uniformly around manholes and structures to prevent unbalanced lateral loading.

Do not operate earth-moving equipment within 5 feet of walls of manholes for the purpose of depositing or compacting backfill materials. Compact backfill adjacent to concrete walls with hand-operated tampers or other equipment that will not damage the manhole.

C.3 Elastomeric Waterproofing Sealer
Elastomeric waterproofing sealer shall be applied to all gravity sewer manholes. Thoroughly sandblast the section of the manhole frame over which the sealer is to be applied, the manhole header, extension and cone and the top 12 inches of the manhole riser. All surfaces shall be free of dust, oil, rust, loose materials and other contaminants. Take necessary precautions to prevent rebound from the sandblasting operation to enter the sewer system. If the mortar between grade rings or brick courses is removed to a depth greater than 1/4 inch by the sandblasting, the joints shall be refilled with mortar as specified herein. All new masonry work shall be cured a minimum of 24 hours prior to applying the waterproofing sealer.

Apply the 4-inch wide bond breaker tape completely around the manhole circumference and centered over the mortar joint between the manhole frame and the manhole extension. Immediately before applying the sealer, wipe all surfaces with a cleaner and immediately prime. The cleaner and primer shall be furnished by the sealer manufacturer. Apply the sealer with a trowel, roller or by spraying to achieve a thickness of not less than 100 wet mils. Do not apply the sealer when the ambient temperature is below 40 degrees F. The sealer shall extend from 9 inches below the bottom of the manhole cone and be carried over the top and onto the flange of the frame a minimum of 5 inches.

Allow the sealer to cure a minimum of 24 hours before backfilling when the ambient temperature is above 70 degrees F, and 48 hours when the ambient temperature is below 70 degrees F. Immediately before backfilling, loosely wrap two layers of 4 mil plastic sheet over the sealed area to prevent direct contact between the sealer and the backfill material.

D Measurement

The department will measure Reconstruct Sanitary Manhole as a unit for each individual manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5013	Reconstruct Sanitary Manhole	Each

Payment is full compensation for providing and installing all required materials, including masonry and fittings: for salvaging and reinstalling existing covers, including frames, grates or lids; for furnishing all necessary excavation, backfilling, disposing of surplus material, and for cleaning out and restoring the work site.

272. Sanitary Sewer Drop Manhole Precast Concrete 48-Inch w/ Casting, Item SPV.0060.5100; Sanitary Sewer Manhole Precast Concrete 48-Inch w/ Casting, Item SPV.0060.5101.

A Description

Construct sanitary manholes consisting of pre-cast reinforced concrete, pre-cast concrete adjustment rings, watertight joints, pre-cast concrete base, pre-cast concrete eccentric cone tops, pre-cast concrete outside drop with necessary reinforcement and encasement, frames and covers, internal frame/chimney seals, steps, connections with all incoming and outgoing sewer, all excavation and granular backfill, and all necessary bypass pumping.

Perform the work in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

B.1 General

All materials and work required to install the manhole will conform to the SSSW. Any material tests required as part of the sewer work shall be performed at a testing laboratory designated by the "facility owner". The test results shall be provided to the construction engineer for approval at the time of delivery.

B.2 Bedding

Bedding shall conform Class "C" bedding of section 3.2.6(a) and File No. 3 of the SSSW. Bedding material shall conform to Table 32 of Section 8.43.2 of the SSSW except the gradation requirements shall be modified as follows;

Gradation requirements for 3/8-Inch Crushed Stone Chips

Sieve sizes	Percent passing by weight
1/2-inch	100%
3/8-inch	90-100
No. 8	0-50
No. 30	0-5

B.3 Backfill

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

B.4 Manhole

Provide sanitary manholes with a minimum 48-inch inside diameter pre-cast concrete barrel sections, with eccentric type cone top section with 24-inch minimum opening, and with an 8-inch thick integral pre-cast concrete base. Provide concrete with a compressive strength of 4000 psi and conforming to ASTM C478. Minimum manhole wall thickness shall be 5 inches. Manholes shall conform to Chapter 8.39.0 of the SSSW and construction details in the plans.

B.5 Frame and Cover-City of Milwaukee

Solid gasket lids meeting the requirements of MS 58-A shall be installed on all new sanitary manholes and shall conform to Chapter 8.48.0 of the SSSW. The new lid shall fit the new frame without rocking or protruding above the surrounding surface. Castings will be furnished and installed by the contractor. Salvaged castings become the property of the contractor.

B.6 Frame and Cover-City of Wauwatosa

New frames and covers are required on all new sanitary manholes and shall be supplied by the contractor. Sanitary sewer manhole covers shall be self-sealing with an O-ring gasket. Castings shall be non-rocking, Type-B self-sealing lid with concealed pick holes. Neenah R-1661-B or approved equal. They shall have one 1-Inch vent hole which is sealed with a

removable flexible plug and two concealed pick holes. Frames for sanitary sewer manholes shall be compatible with the covers.

B.7 Manhole Adjusting Rings
Provide concrete adjustment rings with steel reinforcement in conformance with ASTM C-478 and a minimum of 4-inch in thickness. A maximum of 10-inch for adjustment will be allowed. Multiple grade rings will not be allowed where one will suffice.

B.8 Manhole Seal
Provide internal chimney seal made of a rubber-type product, with a minimum thickness of 3/16 inches, a minimum unstretched width of 8 inches and extruded or molded from a high grade rubber compound conforming to the applicable requirements of ASTM C923. Fabricate the bands used for compressing the sleeve against the manhole from stainless steel conforming to ASTM A240, Type 304, for sheet and ASTM A479, Type 304, for rods. Any screws, bolts, or nuts used on these bands are to be stainless steel conforming to ASTM F593 and F594, Type 304. The internal seal or its appurtenances are not to extend far enough into the manhole opening to restrict entry into or exit from the manhole.

B.9 Manhole Boots
Provide sanitary sewer pipe to pre-cast manhole wall connection with flexible, watertight boot or cast-in seal. Manhole boots for connecting pipes to the sanitary manholes shall be a watertight flexible connection meeting the requirements of ASTM C923. The rubber boots shall be supplied with two stainless steel clamps for attaching the boot to the pipe. A stainless steel “power sleeve” shall be supplied for connecting the boot to the manhole.

B.10 Joints
Provide manhole barrel joints with rubber ring gasket material or butyl plastic gasket material. Rubber gaskets shall conform to requirements of ASTM C443. Butyl plastic gasket material shall conform to requirements of ASTM C990 and AASHTO M-198.

All exterior joints shall be wrapped with Mac-Wrap or approved equal. This shall be considered incidental to the installation of the sanitary sewer manhole.

B.11 Steps
Furnish and install ½ inch diameter manhole steps of grade 60 steel reinforcing rods with molded plastic covering conforming to Detail File No. 15 of the SSSW. Each section of the manhole shall be aligned so the steps create a continuous ladder.

B.12 Outside Drop
All outside drop manholes shall meet the material and construction requirements of section 3.5.8.d and Detail File No. 19 of the SSSW.

C Construction

C.1 General

Excavate to provide a smooth, compacted flat bottom. Place a minimum 6-inch depth of bedding material conforming to the requirements of the SSSW and compact prior to setting manhole base and riser section.

Construct concrete bench in the interior bottom of the sanitary manhole which are precast or poured-in-place. The bench shall extend to the top of the pipe. Construct the bench invert to provide a smooth flow line and conform to the curvature of the pipe.

Install external manhole joint seal on all manhole barrel section joints in addition to joint gasket seal.

Reconnect existing sewer main and laterals which are to enter new manholes in accordance to chapter 3.4.0 of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(B) of the SSSW, except the initial compacted lift shall be two (2) feet, and shall be modified to read, "Each subsequent compacted lift of material shall be one (1) foot". Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Final rim elevations shall be ¼" to ½" below final grade in asphalt pavement and at final grade in concrete pavement and in grass. Adjustment rings shall not exceed 7.5 inches.

Perform a vacuum test on each new sanitary manhole in accordance to section 3.7.3 of the SSSW, work to be completed and paid as a separate pay item.

Provide by-pass pumping of wastewater round construction zone during working hours. During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

C.2 Outside Drop

Any incoming sewer main or lateral entering a manhole greater than 2 feet above the spring line of the outgoing sewer shall be connected to the manhole by means of an outside drop manhole. The drop pipe shall be the same diameter as the incoming sewer and shall be constructed in accordance to section 3.5.8.d and Detail File No. 19 of the SSSW.

D Measurement

The department will measure Sanitary Sewer Drop Manhole Precast Concrete 48-Inch w/ Casting and Sanitary Sewer Manhole Precast Concrete 48-Inch w/ Casting as each individual manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5100	Sanitary Sewer Drop Manhole Precast Concrete 48-Inch w/ Casting	Each
SPV.0060.5101	Sanitary Sewer Manhole Precast Concrete 48-Inch w/ Casting	Each

Payment is full compensation for furnishing and installing all materials including pre-cast manhole base, riser, bench, cone section, chimney adjustment rings, frames, grates or lids, gaskets, manhole boots, manholes seals, joint seals, steps, bedding material, granular backfill material; for exterior drop pipe with all necessary reinforcement, encasement, strapping, and fasteners; for furnishing all excavation, dewatering, sheathing and shoring, forming foundation, and masonry work; for making sanitary sewer connections; for making lateral connections: for backfilling including mechanical compaction and compaction testing; for removing sheeting and shoring; for disposal of all surplus or waste material; and for clean-up. Vacuum Testing will be paid at a separate unit price. The removal of existing sanitary sewer pipe and manholes from within the trench of replacement of sanitary sewer manholes will not be paid for separately, but shall be considered incidental to the item.

273. Sanitary Manhole Vacuum Testing, Item SPV.0060.5102.

A Description

Perform the work in accordance to the plans and the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions. Sanitary sewer manhole vacuum test in accordance to requirements of Section 3.7.6 of the SSSW.

B Materials

Provide vacuum test equipment, meters, gauges, plugs, and other equipment, materials and facilities necessary to make specified tests. Provide bulkheads, blocking, bracing or other temporary sectionalizing devices that may be required.

C Construction

Manholes shall be tested after installation with all connections in place. Test shall include testing of the seal between the frame and the concrete cone, slab or grade rings.

Isolate the manhole to be tested by plugging the inlet and outlet pipes with an inflatable stopper or other approved plug. Plug lift holes with non-shrink grout.

Vacuum test equipment shall be place at the inside top cone section, in accordance to the manufacturers recommendations, Inflate the seal to 40 psi to effect a seal between the base and manhole. Run vacuum pump until a vacuum of 10 inches of mercury is obtained.

With Vacuum pump shut off and the valve on the vacuum line of the test head closed, measure the time for the vacuum to drop to 9 inches of mercury. The manhole test is acceptable if the time exceeds the value as listed in table 6a section 3.7.6 of the SSSW.

If a manhole fails the vacuum test, the manhole shall be repaired with a non-shrinkable grout or other material or method approved by the City of Milwaukee. The manhole surfaces shall be properly prepared prior to any repairs. Once the repair material has cured according to the manufacturer's recommendations the vacuum test shall be repeated. This process shall continue until a satisfactory test is obtained.

D Measurement
The department will measure Sanitary Manhole Vacuum Testing by each individual unit, acceptably tested.

E Payment
The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5102	Sanitary Manhole Vacuum Testing	Each

Payment is full compensation for completing full vacuum test, including furnishing and installing all testing equipment, including meters, gauges, and material required to complete the test.

274. Removing Sanitary Manhole, Item SPV. 0060.5103.

A Description
This work includes removing existing sanitary manholes in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials
Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

Remove the manhole in its entirety. Perform work in accordance to the pertinent specifications of standard spec 204. The contractor is responsible for the safe methods and sequence of controlled removal operations. Completely remove the existing manhole to the extent required to avoid interfering with new construction work as shown on plans and as directed by the engineer.

Abandon unused sewers not to be removed in accordance to Section 3.2.24 of the SSSW.

The cutting and removal of existing sanitary sewer manholes from within the trench of replacement sanitary sewer will not be paid for separately, but shall be considered incidental to the respective sanitary sewer item.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Salvaged castings become the property of the contractor.

Provide by-pass pumping of wastewater round construction zone during working hours. During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Removing Sanitary Manhole as a unit for each individual manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5103	Removing Sanitary Manhole	Each

Payment is full compensation for providing all excavating; furnishing and installing all materials; for removing manhole; for abandoning unused sewers; for furnishing and placing granular backfill; for salvaging frames and covers; for hauling and disposing of all materials.

275. Abandoning Sanitary Manhole, Item SPV. 0060.5104.

A Description

This work includes abandoning existing sanitary manholes in place, in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

B.1 General

Furnish Backfill Slurry in accordance to the pertinent requirements of standard spec 209 except as hereinafter modified. Use aggregates that conform to standard spec 501 for Grade A Concrete. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily.

C Construction

C.1 General

Clean manhole thoroughly. Plug the existing pipe with an 8-inch brick or concrete wall. Remove the walls of the structure to a depth of 3 feet below grade or to the base if directed by the engineer. Fill the excavation with Backfill Slurry, to existing surface or to appropriate depth for pavement restoration. Maintain satisfactory bypass service during these operations.

Salvaged castings become the property of the contractor.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Abandoning Sanitary Manhole as a unit for each individual manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5104	Abandoning Sanitary Manhole	Each

Payment is full compensation for furnishing and installing all materials; for providing positive drainage of the area to be backfilled; for furnishing and placing Backfill Slurry; for salvaging frames and covers and for disposing of materials.

276. Partial Abandonment of MMSD Sanitary Manhole, Item SPV.0060.5107.

A Description

This special provision describes the partial abandonment of existing MMSD sanitary manhole in place, in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin (SSSW).

Notify Larry Anderson (MMSD), (414) 225-2241, of the commencement of construction at least 5 days in advance.

B (Vacant)

C Construction

The Milwaukee Metropolitan Sewerage District (MMSD) manhole was previously filled to a depth of approximately 2 feet below grade. Remove the existing brick manhole riser walls of the structure to the depth required for the proposed roadway or to an elevation as directed by the engineer.

Salvage the MMSD frame and cover, which become the property of the MMSD. Contact Mike Wojtanowski, with Veolia Water at (414) 747-3841 for pick up.

Dispose of all concrete, stone, brick and other material not designated for salvage as specified for disposing of materials under standard spec 203.3.4.

D Measurement

The department will measure Partial Abandonment of MMSD Sanitary Manhole as each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5107	Partial Abandonment of MMSD Sanitary Manhole	Each

Payment is full compensation for breaking down and removing a portion of the structure walls; for furnishing all necessary excavation, backfilling; for salvaging frame and cover; for hauling and disposing of surplus material and for cleaning out and restoring the work site.

277. Abandoning MMSD Access Panel, Item SPV.0060.5108.

A Description

This special provision describes abandoning a MMSD access panel within a MMSD diversion chamber manhole and removing all sluice gates, electric gate operators and components to the requirements as shown in the plans, in accordance to the applicable sections of standard spec 204, 501, 611, Standard Specifications for Sewer and Water Construction in Wisconsin (SSSW), and as hereinafter provided.

Notify Larry Anderson (MMSD), (414) 225-2241 or (414) 617-1429, of the commencement of construction (including the abandonment of the access panel to verify all necessary components have been removed) at least 5 district business days in advance.

B Materials

B.1 Concrete

Concrete infill shall conform to Grade A concrete requirements in standard spec 501. Design strength shall have a minimum compressive strength at 28 days of 4000 psi.

The engineer reserves the right to take samples of concrete whenever he deems necessary.

B.2 Steel Reinforcement

Steel reinforcement shall conform to C-478 requirements of ASTM specifications.

B.3 Bentonite Waterstops

The bentonite waterstop material shall be the 1-inch by 3/4 inch size flexible strip of bentonite waterproofing compound with an adhesive surface on one side of the strip, and it shall be the waterstop Type RX, as manufactured by the American colloid Company, Arlington Heights, IL, or approved equal.

B.4 Bonding Agent

Bonding agent for installing waterstops in grooves cut into existing concrete shall be Sikastix 391, Sikadur Hi-Mod Gel; Horn Co. Epoxtite Grout 2388, or equal. Bonding agent for use on existing concrete surfaces shall be Sikastix 370, Sikadur Hi-Mod; Horn Co. Epoxtite Binder 2385; or equal.

B.5 Elastomeric Waterproofing Sealer

Elastomeric waterproofing membrane shall be a single component, bitumen-modified, moisture-curing polyurethane similar to TREMproof 60 as manufactured by Tremco, 10701 Shaker Blvd., Cleveland, Ohio 44104; Duramem V500 as manufactured by Pecora Corporation, 2601 Oakland Avenue, Garland, Texas 75040; Thiodeck C.F. as manufactured by Toch/Carboline Company, 350 Hanley Industrial Court, St. Louis, Missouri 63144; or equal.

B.6 Plastic Sheet

Plastic sheet shall be clear plastic, minimum 4 mils. thick, of length and width to cover elastomeric waterproofing sealer.

C Construction

C.1 General

Remove the access panel, valve box and the access panel cast-in-place concrete riser to the elevation of the existing concrete deck. Construct a cast-in-place concrete infill conforming to the detail as shown in the plans. Place concrete infill to match existing concrete deck thickness. Cut off any conduit encountered flush to the outside wall of the

structure and backplaster at the structure exterior with Type M mortar to a minimum thickness of ¾-Inch.

C.2 Sluice Gates and Electrical Components Removal
Remove all electric gate operators and sluice gates. Remove all components related to the sluice gate operations including but not limited to valve box, stems, guides, and nuts.

C.3 Elastomeric Waterproofing Sealer
Elastomeric waterproofing sealer shall be applied as shown in plans. Thoroughly clean the section of the concrete deck over which the sealer is to be applied. All surfaces shall be free of dust, oil, rust, loose materials and other contaminants. All new masonry work shall be cured a minimum of 24 hours prior to applying the waterproofing sealer.

Allow the sealer to cure a minimum of 24 hours before backfilling when the ambient temperature is above 70 degrees F, and 48 hours when the ambient temperature is below 70 degrees F. Immediately before backfilling, loosely wrap two layers of 4 mil plastic sheet over the sealed area to prevent direct contact between the sealer and the backfill material.

D Measurement
The department will measure Abandoning MMSD Access Panel as each individual access panel, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5108	Abandoning MMSD Access Panel	Each

Payment is full compensation for providing and installing all required materials including concrete, mortar, reinforcement, bentonite waterstop, bonding agent, elastomeric waterproof sealer and plastic sheets; for removing concrete riser and modifying the concrete deck; for removing all components related to the sluice gates; for removing valve box and components; for furnishing all necessary excavation, backfilling, disposing of surplus material and for cleaning out and restoring the work site.

278. Inlet Covers Type 57, Item SPV.0060.8004.

A Description
The work under these items shall be in accordance to the requirements of standard spec 611 and the details as shown on the plans.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Inlet Cover (Types) by the unit in place, furnished, installed and acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8004	Inlet Covers Type 57	Each

Payment shall conform to standard spec 611.5.

279. Cover Plates Left In Place, Item SPV.0060.8005.

A Description
Furnish and install a steel plate to cover and support construction, backfill material, and traffic loading at storm sewer structures as shown on the plans, in accordance to the pertinent provisions of standard spec 611, and as hereinafter provided.

Cover plates left in place becomes the property of the department after final acceptance by the engineer.

B Materials
Provide a 0.5-inch minimum thickness steel plate that extends to the outside edge of the existing masonry walls.

C Construction
Clean out all soil, debris, other accumulated matter, and materials deposited or lodged due to the contractor's operations from the structure prior to placing the cover plate left in place on the structure. Place cover plate over portion of storm sewer structure which is below the proposed flow line elevation. Do not extend covers above the proposed flow line to prevent flow bypass of the inlet.

Place cover plates as shown on the plans.

D Measurement
The department will measure Cover Plates Left In Place as each individual cover plate left in place, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8005	Cover Plates Left In Place	Each

Payment is full compensation for furnishing and installing the cover plate; and for leaving cover plate in place.

280. Reconnect Storm Sewer Laterals, Item SPV.0060.8007.

A Description
This special provision describes reconnecting existing storm sewer laterals to new structures or new pipe.

B (Vacant)

C Construction
Identify all laterals in existing structures or pipes prior to that structure's or pipe's removal. Remove existing lateral pipes to the next good joint and replace in-kind with equivalent modern materials such as PVC or concrete. Verify that positive drainage is achieved when connecting lateral. The contractor will be allowed to salvage any structurally sound pipe that was removed with prior approval by the engineer. Connect the existing pipes to the new pipes with the appropriate coupling, concrete collar or by means approved by the engineer. Concrete masonry for concrete collar shall be in accordance to standard spec 501. Any additional pipe or materials required to reconnect the storm sewer laterals shall be considered incidental to this bid item.

D Measurement
The department will measure Reconnect Storm Sewer Laterals by each lateral connected, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8007	Reconnect Storm Sewer Laterals	Each

Payment is full compensation for performing all work; removing, furnishing and installing all materials, coring, couplings, concrete collars, and pipe.

281. Manhole 9-Foot Special, Item SPV.0060.8012; Manhole 10-Foot Special, Item SPV.0060.8013.

A Description
This work shall consist of design and construction of either a cast-in-place or precast storm sewer structure made of concrete with necessary reinforcement, metal frames, grates and lids, including required excavating and backfilling.

B Materials
Conform to standard spec 611.2.

C Construction
Conform to standard spec 611.3.

D Measurement
The department will measure Manhole Structure (type) by each individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8012	Manhole 9-Foot Special	Each
SPV.0060.8013	Manhole 10-Foot Special	Each

Payment is full compensation for structure design; providing all materials, including all masonry, for Grade "A" concrete adjustments and monolithic concrete shimming; conduit and sewer connections, steps and other fittings; for furnishing all excavating and backfill; disposing of surplus material; and for cleaning out and restoring the work site. The department will pay for covers, including frames, grates, and lids separately.

The department will apply contract unit prices without adjustments to the quantities of manholes constructed to depths not greater than one foot above or below the elevations shown on the plans. Manholes that the engineer orders constructed to a depth greater than one foot above or below elevations shown on the plans will be specified for extra work and paid for in accordance to standard spec 109.4.

282. Pipe Connection to Existing Structure, Item SPV.0060.8015.

A Description
This special provision describes connecting new storm sewer pipe to existing structure.

B Materials
Conform to standard spec 608.2 and standard spec 611.2

C Construction
Conform to standard spec 607.3 and standard spec 611.3

D Measurement
The department will measure Pipe Connection to Existing Structure by each pipe connected, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8015	Pipe Connection to Existing Structure	Each

Payment is full compensation for performing all work; excavation, backfilling, furnishing, masonry and fittings; disposing of surplus material, coring holes in existing structure to connect new pipe; and installing all materials, couplings, concrete collars, and pipe.

283. Sedimentation Basin, Item SPV.0060.8017.

A Description
Design, supply and maintain a sedimentation basin used to de-water the storm sewer or culvert pipes.

B (Vacant)

C Construction
Design a sedimentation basin that is able to filter the contaminated water prior to discharging it back into the adjacent drainage way conforming to Wisconsin DNR technical standard guidelines for sedimentation basin design. Submit sedimentation basin design to the engineer for approval prior to its construction and include in ECIP and subsequent amendments. Maintain the sedimentation basin at regular intervals or as directed by the engineer.

D Measurement
The department will measure Sedimentation Basin as each individual basin installed in accordance to the contract and accepted.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8017	Sedimentation Basin	Each

Payment is full compensation for design and approval; furnishing and maintaining each basin; for any polymers required to achieve performance standards; for removal of the basin.

284. Removing Bulkhead, Item SPV.0060.8018.

A Description
This special provision describes removing existing bulkhead as shown in the plans, and as hereinafter provided.

B (Vacant)

C Construction
Carefully remove the bulkhead without damaging the pipe. Replace portion of damaged pipe with similar size and material.

D Measurement
The department will measure Removing Bulkhead by each bulkhead removed in accordance to the contract and accepted.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8018	Removing Bulkhead	Each

Payment is full compensation for furnishing all materials; removing bulkhead, replacing damaged pipe material including concrete collar around the pipe; and excavating and backfilling where necessary.

285. Emergency Shaft, Item SPV.0060.8040.

A Description
A.1 General
This special provision describes constructing an emergency shaft to remove or otherwise clear boulder and known/identified or unknown/unidentified man-made subsurface obstructions encountered during tunnel excavation by MTBM, and other tunneling, jacking, boring, or auguring methods that cannot be removed or cleared through the face of the tunnel excavation.

A.2 Definitions
For MTBM operation, natural boulders and man-made obstructions are defined as per the specified conditions described in the Geotechnical Baseline Report and unknown/unidentified obstructions are man-made obstructions that are not shown or identified in the plans.

For tunnel excavation by tunneling, jacking , boring, or auguring methods other than MTBM, surface obstructions are defined as any objects, known/identified or unknown/unidentified man-made or naturally deposited that are encountered at the face of tunnel excavation.

B (Vacant)

C Construction
Upon exhausting all other means of removing or clearing an obstruction through the face of the tunnel excavation, and only if authorized in writing by the engineer, construct and excavate an emergency shaft to clear or remove the obstruction.

C.1 Submittals
Submit shop drawings and work plan for excavation support system prepared and stamped by professional engineer registered in state of Wisconsin in accordance to special provision article Shaft Excavation Support System Manhole Z6283 through Manhole

Z2822. Submit discharge permit, water control plan, and quality control items in accordance to special provisions, article Control of Water.

C.2 Design

The emergency shaft shall be designed by the contractor's excavation support system design engineer. The qualification of the contractor's excavation support system design engineer, the design criteria of excavation support system for emergency shaft, and general shaft construction requirements shall be in accordance to requirements specified in the special provisions, articles Shaft Excavation Support System Manhole Z6283 through Manhole Z2822.

C.3 Installation

The contractor shall furnish materials for installing, monitoring, maintaining, and removing ground support systems. The contractor's engineer shall maintain involvement and responsibility from design through installation, performance and abandonment or removal of ground support systems.

The contractor shall implement groundwater control measures, as required in the special provisions, article Control of Water. Installation of excavation support systems shall not be done without groundwater control measures.

The contractor shall remove all elements of excavation support systems within 6 feet below the existing or the final ground surface elevation, whichever is lower. Repair any settlement or damage to the work or to adjacent property as a result of removing excavation support systems. Excavation support systems that cannot be safely removed and without causing settlement or damage to the work or adjacent property shall be left in place, at no additional cost to the department.

If backfill material is loosened to an extent that it settles more than one inch as a result of attempts to remove ground support members, the contractor shall be responsible for remedial measures to re-compact or consolidate the loosened backfill. The contractor's engineer shall be responsible for determining if ground support system can be safely removed. Excavation support system elements that are left in place shall be at the contractor's expense. Restoration of any damage and the cost of remediating disturbed backfill or adjacent property damage caused by removal of ground support systems shall be at the contractor's expense.

Backfill the emergency shaft in accordance to standard spec 206.3.13. Backfill around the pipe inside the shaft shall be in accordance to standard specs 209.2, 520.3.2 and 520.3.4.

D Measurement

The department will measure Emergency Shaft by each of the shaft, completed and accepted, regardless of the size and depth of the shaft. Only emergency shafts authorized by the engineer to clear obstructions will be measured for payment.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8040	Emergency Shaft	Each

Payment for Emergency Shaft is full compensation for furnishing, designing, installing, and removing the obstruction, removing excavation support system, and backfilling, including but not limited to: a complete dewatering system design, installation, monitoring, discharge, and all necessary incidental work; excavation; all elements of excavation support systems; removing obstructions encountered; ground improvements; ancillary work for tunnel portals; providing and placing backfill; shaft base material compaction and work slab; removal of excavation support systems; disposing of surplus material; equipment mobilization/demobilization.

286. Inlet Covers Type 27-M, Item SPV.0060.8050.

A Description

The work under these items shall be in accordance to the requirements of standard spec 611 and the details as shown on the plans.

B (Vacant)

C (Vacant)

D Measurement

The department will measure Inlet Covers Type 27-M by the unit in place, furnished, installed and acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8050	Inlet Covers Type 27-M	Each

Payment is full compensation for providing new covers, including frames and grates, bolts, and all other required materials; and for installing each cover.

287. Removing Welds from Sewer Access Covers, Item SPV.0060.8052.

A Description

This special provision describes maintaining and removing welds left in place, installed during previous contracts, from sewer access covers at locations as shown on the plans. This work also includes removing welds installed during this contract.

B (Vacant)

C Construction
Maintain welds left in place from a previous contract by promptly rewelding failed welds in accordance to the Welding Sewer Access Covers specification. Remove welds and sharp edges from covers and fixtures after freeway traffic is permanently shifted from them as shown in plans or directed by the engineer. Repair or replace covers damaged due to welding removal as the engineer directs.

D Measurement
The department will measure Removing Welds from Sewer Access Covers as each individual cover, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8052	Removing Welds from Sewer Access Covers	Each

Payment is full compensation for re-welding failed welds from a previous contract; removing welds, and repairing or replacing damaged covers due to welding removal.
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288. Remove and Cap Existing Drainage Storm Sewer Structure, Item SPV.0060.8062.

A Description
This item describes remove and cap existing drainage Storm Sewer Structure with concrete and necessary reinforcement, including required excavating and backfilling in accordance to construction details shown on plan, the standard specifications, and as hereinafter provided.

B Materials
Furnish materials conforming to standard spec 501 for concrete, standard spec 505 for reinforcement, and standard spec 506 for structural steel and miscellaneous metals.

Furnish grade A concrete with Type II cement conforming to standard spec 501.2. Furnish ASTM 617 Grade 60 reinforcing steel.

Furnish plastic waterstop conforming to standard spec 502.3.6.4 or butyl rubber seal per sealant manufactuer’s recommendations conforming to recommendation ASTM C 990.

Furnish support assemblies conforming to standard spec 611.2.2.

C Construction

Excavate and backfill as specified for excavation for Storm Sewer Structures in standard spec 206, except do not backfill concrete brick until at least 3 days after completing the unit. Use granular backfill material for backfilling.

Construct concrete as specified in standard spec 501, and as specified for culverts and retaining walls in standard spec 504.

Construct concrete brick as specified in standard spec 519.

Construct structural steel and miscellaneous metals as specified for steel bridges in standard spec 506.

Cure the concrete by one of the methods specified in standard spec 502.3.8 for curing concrete in subStorm Sewer Structure units.

Construct the masonry and install waterstop material to provide a watertight joint between new masonry cap and existing manhole.

Clean and remove all materials and debris deposited or lodged in the manhole due to the contractor's operations during construction.

D Measurement

The department will measure Remove and Cap Existing Drainage Storm Sewer Structure as each individual unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8062	Remove and Cap Existing Drainage Storm Sewer Structure	Each

Payment for the Remove and Cap Existing Drainage Storm Sewer Structure is full compensation for providing all materials, including all masonry; for furnishing all excavating; for sheeting and shoring; for backfilling; for providing granular backfill material; for control of water; for temporary support and protection of existing utilities to construction; for removing sheeting and shoring; disposing of surplus material, for providing waterstop or butyl rubber seal; and for cleaning out and restoring the work site. Granular backfill material required for backfilling is incidental to the work.

289. Welding Sewer Access Covers, Item SPV.0060.8080.

A Description

This special provision describes installing and maintaining welds on sewer access covers subjected to live freeway traffic during staged construction.

B Materials

Furnish nickel alloy electrodes stored in hermetically sealed containers. Utilize Lincoln Ferroweld, Crown 255, ESAB Nickel-Arc 99, MG289 ACDC Super Strength Electrode for Contaminated cast iron, or other nickel alloy stick electrodes as approved by the engineer.

C Construction

Remove material that will interfere with weld connections. Clean the weld locations on the cover and casting to bright metal with a steel grinding wheel.

Weld conforming to AWS A5.15 using certified operators. Preheat the casting/cover in the area of the weld to a minimum of 100 degrees F.

For round covers make a minimum of six single-pass, 2-Inch-long welds at the 12, 6, 10, 4, 8, and 2 o'clock positions in that order.

For rectangular covers make a minimum of eight single-pass, 2-Inch-long welds in a similar alternating order with welds at the 1/3 and 2/3 ponts of each side.

Cover each weld with a 2-Inch thick layer of clean, dry, sand in a temperature range of 70 to 90 degrees F immediately after welding to slow cooling. Do not cool with water or compressed air.

Maintain the work by promptly rewelding failed welds. The engineer may allow alternative fastening methods if welds fail repeatedly. Repair or replace damaged covers as the engineer directs.

D Measurement

The department will measure Welding Sewer Access Covers as each individual cover, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8080	Welding Sewer Access Covers	Each

Payment is full compensation for cleaning covers, weldings and re-welding failed welds from current contract. Payment also includes repairing or replacing covers damaged due to welding. Removal of welds will be paid for under a separate item.

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290. Storm Sewer Structure Z813, Item SPV.0060.8500; Storm Sewer Structure Z2822, Item SPV.0060.8501; Storm Sewer Structure Z4048, Item SPV.0060.8502; Storm Sewer Structure Z4619, Item SPV.0060.8503; Storm Sewer Structure Z4621, Item SPV.0060.8504; Storm Sewer Structure Z5348, Item SPV.0060.8505; Storm Sewer Structure Z6374, Item SPV. 0060.8506; Storm Sewer Structure Z6382, Item SPV.0060.8507; Storm Sewer Structure Z6661, Item SPV.0060.8508; Storm Sewer Structure Z6666D, Item SPV.0060.8509; Storm Sewer Structure Z6707, Item SPV.0060.8510; Storm Sewer Structure Z6725, Item SPV.0060.8511; Storm Sewer Structure Z6753A, Item SPV.0060.8512; Storm Sewer Structure Z6753C, Item SPV.0060.8513; Storm Sewer Structure Z6764, Item SPV.0060.8514; Storm Sewer Structure Z6828, Item SPV.0060.8515; Storm Sewer Structure Z6852, Item SPV.0060.8516; Storm Sewer Structure Z6647, Item SPV.0060.8517; Storm Sewer Structure Z6390, Item SPV.0060.8518; Storm Sewer Structure Z7945, Item SPV.0060.8519.

A Description

This work shall consist of design and construction of either a cast-in-place or precast storm sewer structure made of concrete with necessary reinforcement, metal frames, grates and lids, including required excavating and backfilling.

B Materials

Conform to standard spec 611.2.

C Construction

Conform to standard spec 611.3.

D Measurement

The department will measure Storm Sewer Structure (type) by each individual unit, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8500	Storm Sewer Structure Z813	Each
SPV.0060.8501	Storm Sewer Structure Z2822	Each
SPV.0060.8502	Storm Sewer Structure Z4048	Each
SPV.0060.8503	Storm Sewer Structure Z4619	Each
SPV.0060.8504	Storm Sewer Structure Z4621	Each
SPV.0060.8505	Storm Sewer Structure Z5348	Each
SPV.0060.8506	Storm Sewer Structure Z6374	Each
SPV.0060.8507	Storm Sewer Structure Z6382	Each

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.8508	Storm Sewer Structure Z6661	Each
SPV.0060.8509	Storm Sewer Structure Z6666D	Each
SPV.0060.8510	Storm Sewer Structure Z6707	Each
SPV.0060.8511	Storm Sewer Structure Z6725	Each
SPV.0060.8512	Storm Sewer Structure Z6753A	Each
SPV.0060.8513	Storm Sewer Structure Z6753C	Each
SPV.0060.8514	Storm Sewer Structure Z6764	Each
SPV.0060.8515	Storm Sewer Structure Z6828	Each
SPV.0060.8516	Storm Sewer Structure Z6852	Each
SPV.0060.8517	Storm Sewer Structure Z6647	Each
SPV.0060.8518	Storm Sewer Structure Z6390	Each
SPV.0060.8519	Storm Sewer Structure Z7945	Each

Payment is full compensation for providing structure design; providing all materials, including all masonry, for Grade "A" concrete adjustments and monolithic concrete shimming; conduit and sewer connections, steps, and other fittings; for providing and installing butyl rubber joints; for furnishing all excavating, backfilling, disposing of surplus material, and for cleaning out and restoring the work site; except that the department will pay for covers, including frames, grates and lids separately.

The department will apply contract unit prices without adjustments to the quantities of manholes constructed to depths not greater than one foot above or below the elevations shown on the plans. Manholes that the engineer orders constructed to a depth greater than one foot above or below elevations shown on the plans will be specified for extra work and paid for in accordance to 109.4.

291. Obstructions Trenchless Utility Construction, Item SPV.0075.0010.

A Description

A.1 General

This special provision describes removing, drilling, or coring through or otherwise clearing natural deposits and man-made subsurface obstructions when encountered during jacking, boring, or auguring procedures for trenchless utility construction.

A.2 Definitions

For excavation by jacking, boring, auguring, or trenchless methods, subsurface obstructions are defined as any objects, known/identified or unknown/unidentified man-made or naturally deposited that are encountered during jacking, boring or auguring operations for utility construction that prohibit advancement of the equipment.

Surface obstructions are defined as any objects, man-made or naturally deposited, encountered within 6 feet of the ground surface. Subsurface obstructions are defined as any obstructions that are encountered by the equipment at a depth greater than 6 feet below the ground surface.

Known obstructions are man-made obstructions that are shown or identified in the plans include materials, such as old concrete foundations or abandoned utilities. Unknown obstructions are man-made obstructions that are not shown or identified in the plans. Unknown/unidentified naturally deposited obstructions are naturally occurring deposits such as rock, boulders, cobbles, nested cobbles and nested boulders less than an average size of 12-inches, are not considered obstructions, therefore it will be considered included in the appropriate bid item and are not applicable to the provision of this pay item.

B (Vacant)

C Construction

C.1 Submittals

For excavation by jacking, boring, auguring or trenchless methods, submit contingency plan describing methods, equipment, and procedures to be used to clear obstructions.

C.2 Obstruction Removal:

Remove surface and subsurface obstructions at selected locations for construction. Use special tools and/or procedures when the contractor cannot advance the hole more than 12 inches in 60 minutes using conventional rock augers fitted with teeth, drilling buckets, or under reaming tools operating at maximum power, torque, and thrust. Special procedures and/or tools may be required but are not limited to chisels, breakers, core barrels, air hammer tools, and hand excavation. Other methods for obstruction removal can be employed to aid in the removal if acceptable to the engineer. Blasting is not permitted.

When a subsurface obstruction is encountered, notify the engineer in writing prior to beginning any work to remove the obstruction. Upon engineer acceptance of the notification, the contractor shall begin work in accordance to the submitted and approved contingency plan to remove, treat, clear or otherwise make it possible for the jacking, boring, or auguring operation to advance past the obstruction(s) that impede forward progress.

If the contractor has exhausted all means of clearing the obstruction using methods delineated in the approved contingency plan, the contractor shall submit a revised plan to remove the obstruction, hereinafter referred to as the “correction plan”. Upon engineer acceptance of the correction plan, the contractor shall continue work in accordance to the correction plan, to remove, treat, clear or otherwise make it possible for the trenchless technology operation to advance past the obstruction.

C.3 Emergency Shaft

Man-made or natural deposited obstructions that cannot be removed will require an emergency shaft to clear the obstruction. See special provisions, article Emergency Shaft.

D Measurement

The department will measure Obstructions Trenchless Utility Construction by the hour for each hour the contractor actively spends removing, coring or clearing natural deposits and man-made subsurface obstructions. A quantity of one hour will be paid upon determination that an obstruction is encountered that prevents forward progress.

Upon removal of the unknown man-made subsurface obstruction, portions of the final hour measured will be rounded up to the next whole hour. Down time spent planning for subsurface obstruction removal, time to develop a correction plan, or delays caused by the mobilization of special equipment and tools not readily available at the site will not be measured for payment.

Measurement Example		Paid Obstruction Hours
1	Equipment encounters possible obstruction. Contractor notifies engineer. Start clock.	0.00
2	Equipment does not advance 12-inches after attempting to do so for at least 60 minutes.	1.00
3	Contractor resumes work clearing obstruction the following day. Assume the obstruction is cleared in aggregate total of 1 hours and 15 minutes of time. Obstruction is identified to be a previously unknown and unidentified man-made obstruction.	2.00

Only man-made subsurface obstructions and natural deposits (rock, boulders, cobbles, nested cobbles and nested boulders) greater than an average size of 12-inches in 60 minutes will be measured for payment. Work to clear and remove surface obstructions and any natural deposits (rock, boulders, cobbles, nested cobbles and nested boulders) will not be measured separately for payment and shall be included in the applicable bid item.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0075.0010	Obstructions Trenchless Utility Construction	HRS

Payment for Obstructions Trenchless Utility Construction is full compensation for removal of man-made and/or natural deposit obstructions; and for furnishing all materials, labor, equipment, additional concrete, and incidentals necessary to complete the work.

Emergency Shaft will be measured and paid for separately under the SPV item Emergency Shaft included in the contract.

292. Obstructions Drilled Foundation Shaft, Item SPV.0075.4200; Obstructions Wall Secant Pile, Item SPV.0075.4205; Obstructions Foundation Drilling, Item SPV.075.4210; Obstructions Sign Supports Concrete Masonry, Item SPV.0075.4215.

A Description

A.1 General

The work included herein consists of removing, drilling, or coring through unknown, and unidentified, man-made subsurface obstructions when encountered for construction of drilled foundation shafts, drilled shafts for secant pile retaining walls, foundation drilling for solider pile retaining walls or drilling for concrete masonry sign supports.

A.2 Definitions

Surface obstructions are defined as any objects, man-made or naturally deposited, encountered within 6 feet of the ground surface. Subsurface obstructions are defined as man-made obstructions that are encountered by the drilling equipment at a depth greater than 6 feet below the ground surface. Obstructions include only man-made materials, such as old concrete foundations or abandoned utilities. Known obstructions are man-made obstructions that are shown or identified in the plans. Unknown obstructions are man-made obstructions that are not shown or identified in the plans. Naturally occurring deposits such as rock, boulders, cobbles, nested cobbles and nested boulders, are not considered obstructions and therefore are not applicable to the provision of this pay item.

B (Vacant)

C Construction

Remove surface and subsurface obstructions at drilled shaft locations. For drilled foundation shafts, wall secant pile shafts and foundation drilling, use special tools and/or procedures when the contractor cannot advance the hole more than 12 inches in 60 minutes using conventional rock augers fitted with teeth, drilling buckets, or under reaming tools operating at maximum power, torque, and down thrust. For drilling associated with the construction of sign supports, use special tools and/or procedures when the contractor cannot advance the hole more than 12 inches in 60 minutes using conventional earth augers operating at maximum power, torque, and down thrust. Special procedures and/or tools may be required but are not limited to chisels, breakers, core barrels, air hammer tools, and hand excavation. Other methods for obstruction removal can be employed to aid in the removal if acceptable to the engineer. Blasting is not permitted.

When an unknown subsurface obstruction is encountered, notify the engineer prior to beginning any work to remove the obstruction.

D Measurement

The department will measure Obstructions (Type) by the hour for each hour the contractor actively spends removing or coring through unknown man-made subsurface obstructions. A quantity of one hour will be paid upon the determination that a subsurface obstruction is encountered based on lack of hole advancement with conventional tools as set forth in this

specification. Upon removal of the unknown man-made subsurface obstruction, portions of the final hour measured will be rounded up to the next whole hour. Down time spent planning for subsurface obstruction removal or delays caused by the mobilization of special equipment and tools not readily available at the site will not be measured for payment.

Measurement Example		Paid Obstruction Hours
1	Drilling encounters possible obstruction. Contractor notifies engineer. Start clock.	0.00
2	Conventional drilling equipment does not advance 12 inches after attempting to do so for at least 60 minutes.	1.00
3	Contractor resumes work clearing obstruction the following day. Assume the obstruction is cleared in aggregate total of 1 hour and 15 minutes of time. Obstruction is identified to be a previously unknown and unidentified man-made obstruction.	2.00

Only unknown (not identified in the plans), man-made subsurface obstructions, will be measured for payment. Work to clear and remove surface obstructions, known obstructions identified on the plans, and any natural deposits (rock, boulders, cobbles, nested cobbles and nested boulders) will not be measured separately for payment and shall be included in the applicable items for Drilled Shaft Foundation 98.43-Inch or 78.74-Inch, Wall Secant Pile 47.24-Inch, Foundation Drilling, or Sign Supports Concrete Masonry.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0075.4200	Obstructions Drilled Foundation Shaft	HRS
SPV.0075.4205	Obstructions Wall Secant Pile	HRS
SPV.0075.4210	Obstructions Foundation Drilling	HRS
SPV.0075.4215	Obstructions Sign Supports Concrete Masonry	HRS

Payment is full compensation for removal and disposal of unknown, man-made subsurface obstructions; and for furnishing all materials, labor, equipment, additional concrete, and incidentals necessary to complete the work.

293. Obstructions Tunnel Excavation, Item SPV.0075.8097.

A Description

A.1 General

This special provision describes removing, drilling, or coring through or otherwise clearing boulders and known/identified or unknown/unidentified man-made subsurface obstructions when encountered during tunnel excavation by MTBM for construction of storm sewer.

A.2 Definitions
Natural boulders and man-made obstructions defined as per the specified conditions described in the Geotechnical Baseline Report. Unknown/unidentified obstructions are man-made obstructions that are not shown or identified in the plans or Geotechnical Baseline Report.

B (Vacant)

C Construction
C.1 Submittals
Submit tunnel work plan including contingency plan and proposed details of methods and equipment to be used to clear obstructions as specified in special provisions, article Tunnel Excavation.

C.2 Obstruction Removal: Should the tunneling operations encounter an obstruction that impedes the forward progress of the tunnel machine, the contractor shall notify the engineer immediately in writing. Upon engineer acceptance of the notification, the contractor shall begin work in accordance to the submitted and approved contingency plan, to remove, treat, clear or otherwise make it possible for the tunnel machine to advance past the obstruction(s) that impede forward progress of the machine.

If the contractor has exhausted all means of clearing the obstruction using methods and equipment delineated in the submitted contingency plan, the contractor shall submit a revised plan to remove the obstruction, hereinafter referred to as the "correction plan". Upon engineer acceptance of the correction plan, the contractor shall continue work in accordance to the correction plan, to remove, treat, clear or otherwise make it possible for the tunnel machine to advance past the obstructions that impede forward progress of the machine.

C.3 Emergency Shaft
Man-made or boulder obstructions that cannot be removed through the tunnel machine face will require an emergency shaft to clear the obstruction. See special provisions, article Emergency Shaft.

D Measurement
The department will measure Obstructions Tunnel Excavation by the hour for each hour the contractor actively spends removing or clearing boulders and known/identified or unknown/unidentified man-made subsurface obstructions. A quantity of one hour will be paid upon the determination that an obstruction is encountered based on forward progress of tunnel excavation by cutterhead slower than defined in the Geotechnical Baseline Report. Objects that do not impact the tunneling progress defined in the Geotechnical Baseline Report will not be considered payable obstructions. Upon removal of the obstruction, portions of the final hour measured will be rounded up to the next whole hour. Down time spent planning for subsurface obstruction removal, time to develop a

correction plan, or delays caused by the mobilization of special equipment and tools not readily available at the site will not be measured for payment.

	Measurement Example	Paid Obstruction Hours
1	Tunnel excavation machine encounters possible obstruction. Contractor notifies engineer. Start clock.	0.00
2	Tunnel excavation machine does not advance more than 30% of normal forward progress for at least 60 minutes using a MTBM cutter head.	1.00
3	Contractor resumes work clearing obstruction the following day. Assume the obstruction is cleared in aggregate total of 6 hours and 30 minutes of time. Obstruction is identified to be a previously unknown and unidentified man-made obstruction.	7.00

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0075.8097	Obstructions Tunnel Excavation	HRS

Payment for Obstructions Tunnel Excavation is full compensation for removal of man-made or boulder obstructions through the tunnel face as described in the Geotechnical Baseline Report; and for furnishing all materials, labor, equipment, additional concrete, and incidentals necessary to complete the work.

Emergency Shaft will be measured and paid for separately under the SPV item Emergency Shaft included in the contract.

294. Seeding Mixture Native Seed Butterfly Mix, Item SPV.0085.0200.

A General

This special provision describes seeding native seed butterfly mix. Conform to standard spec 630 for native seed mixes 70 or 70A except as follows:

B Materials

Use a seed mix composed of the following with a sowing rate for seeds in pounds per 1000 square feet at 0.7 pounds:

Common Name	Botanical Name	Mixture %
Forbs/*Legumes		
Butterfly Weed	*Asclepias tuberosa*	3
Common Milkweed	*Asclepias syriaca*	2
New England Aster	*Aster novae-angliae*	2
Rough Blazingstar	*Liatris aspera*	2
Showy Goldenrod	*Solidago speciosa*	2
Wild White Indigo *	*Baptisia leucantha*	1
Pale Purple Coneflower	*Echinacea pallida*	1
Showy Tick Trefoil *	*Desmodium canadense*	1
Purple Prairie Clover *	*Dalea purpurea*	1
Wild Lupine*	*Lupinus perennis*	1
New Jersey Tea	*Ceanothus americanus*	1
Showy Blazingstar	*Liatris ligulistylis*	2
Leadplant*	*Amorpha canescens*	1
Whorled milkweed	*Asclepias verticillata*	1
Smooth Blue Aster	*Aster laevis*	1
Bergamot	*Monarda fistulosa*	3
	total	25%
Grasses		
June Grass	*Koeleria macrantha*	10
Switchgrass	*Panicum virgatum*	5
Sideoats Gramma	*Bouteloua curtipendula*	15
Canada Wildrye	*Elymus canadensis*	15
Little Bluestem	*Schizachyrium scoparium*	20
Indiangrass	*Sorgatrum nutans*	10
	total	75%

C Construction

In addition to the weeds eradicated during the first growing season under standard spec 630.3.3.6.2, eradicate all Wisconsin NR40 prohibited and restricted invasive plant species and the following highly undesirable species that may pose a threat to the successful establishment of the planting:Reed Canary Grass (Phalaris arundinacea) and Crown Vetch (Coronilla varia). Keep seeded areas free of unwanted species until the nurse crop has germinated and reached a minimum height of 4 inches.

D Measurement

The department will measure Seeding Mixture Native Seed Butterfly Mix according to standard spec 630.4.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0085.0200	Seeding Mixture Native Seed Butterfly Mix	LB

Payment is full compensation according to standard spec 630.5.
SEF-ZOO IC 14_0519

295. Ice HPC Hot Weather Concreting, Item SPV.0085.0900.

A Description
This work consists of furnishing ice for use in HPC Masonry Structures concrete mixes to meet the concrete surface evaporation rate and mix temperature requirements specified for hot weather concreting in the contract special provision item HPC Masonry Structures.

B Materials
Water used to produce ice shall meet the requirements of standard spec 501.2.4.

C Construction
To meet the concrete surface moisture evaporation rate and mix temperature requirements specified in standard spec 501.3.8.2 as modified in the contract special provision article HPC Masonry Structures, the contractor may elect to use ice or be directed by the engineer to use ice in concrete mixes for the item HPC Masonry Structures.

D Measurement
The department will measure Ice HPC Hot Weather Concreting by the pound acceptably completed.

E Payment
The department will pay for measured quantities at the specified contract unit price of $0.75 per pound under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0085.0900	Ice HPC Hot Weather Concreting	LB

Payment is full compensation for supplying and adding ice to concrete mixes for the item HPC Masonry Structures as specified herein.

For the item Ice HPC Hot Weather Concreting, the department will pay $0.75 per pound for the quantity of ice required to meet concrete surface evaporation rate or concrete mix temperature limits specified in the contract for the item HPC Masonry Structures.

296. Bar Steel Reinforcement HS Stainless Bridges, Item SPV.0085.4300.

A Description
This work consists of furnishing and placing stainless steel reinforcing bars as shown in the plans and as hereinafter provided.

B Materials

B.1 General

Conform to standard spec 505.2 except as modified in this special provision.

B.2 Grade and Type

The material shall conform to ASTM A 955 and to one of the following Unified Numbering System (UNS) designations: S31653, S31803, S32205, or S32304.

Supply Grade 60 bars, all of the same UNS designation.

B.3 Evaluation of Corrosion Resistance

Prior to fabrication, supply test results from an independent testing agency certifying that stainless steel reinforcement from the selected UNS designation meets the requirements of Annex A1 of ASTM A955. Corrosion performance for the selected UNS designation shall be redemonstrated if the processing method is significantly altered. Removal of mill scale or pickling processes used for stainless steel reinforcement supplied under this contract shall be the same as those used to prepare the samples tested per Annex A1 of ASTM A955

B.4 Chemical Composition

Material shall conform to that specified in ASTM A276, Table 1, Chemical Requirements, for the given UNS designation.

B.5 Heat Treatment

Bars may be furnished in one of the heat treatment conditions listed in ASTM A955, and as needed to meet the requirements of this specification.

B.6 Finish

Supply bars that are free of dirt, mill scale, oil and debris by pickling to a bright or uniform light finish. Bars supplied with a tarnished or mottled finish are sufficient cause for rejection. Fabricate and bend bars using equipment that has been thoroughly cleaned or otherwise modified to prohibit contamination of the stainless steel from fragments of carbon steel or other contaminants.

Bars displaying rust/oxidation, questionable blemishes, or lack of a bright or uniform pickled surface are subject to rejection.

B.7 Bending and Cutting

Bend bars in accordance to standard spec 505.3.2 and ASTM A955. Use fabrication equipment and tools that will not contaminate the stainless steel with black iron particles. To prevent such contamination, equipment and tools used for fabrication, including bending and cutting, shall be solely used for working with stainless steel. Do not use carbon steel tools, chains, slings, etc. when fabricating or handling stainless steel reinforcing bars.

B.8 Control of Material

All reinforcement bars or bar bundles delivered to the project site shall be clearly identified with tags bearing the identification symbols used in the Plans. The tags shall also include the UNS designation, heat treat condition, heat number, grade (corresponding to minimum yield strength level), and sufficient identification to track each bar bundle to the appropriate Mill Test Report.

Provide samples for department testing and acceptance in accordance to the CMM requirements for Concrete Masonry Reinforcement – Bar Steel (Uncoated).

Provide Mill Test Reports (MTR) for the project that:

- Are from the supplying mill verifying that the stainless reinforcement provided has been sampled and tested and the test results meet ASTM A 955, ASTM A 276, Table 1 and the Contract requirements;

- Include a copy of the chemical analysis of the steel provided, with the UNS designation, the heat lot identification, and the source of the metal if obtained as ingots from another mill;
-
- Include a copy of tensile strength, yield strength and elongation tests per ASTM A955 on each of the sizes of stainless steel reinforcement provided;
-
- Permit positive determination that the reinforcement provided is that which the test results cover;
-
- Include a statement certifying that the materials meet standard spec 106 regarding material being melted and manufactured in the United States; and
-
- Certify that the bars have been pickled to a bright or uniform light finish.

C Construction

C.1 General

Conform to the construction methods in standard spec 505.3 except as modified in this special provision:

Ship, handle, store, and place the stainless steel reinforcing bars according to the applicable provisions with the following additions and exceptions:

- Prior to shipping, ensure that all chains and steel bands will not come into direct contact with the stainless steel reinforcing bars. Place wood or other soft materials (i.e., thick cardboard) under the tie-downs. Alternatively, use nylon or polypropylene straps to secure the stainless steel reinforcing bars.

- When bundles of reinforcing steel and stainless steel reinforcing bars must be shipped one on top of the other, load the stainless steel reinforcing bars on top. Use wooden spacers to separate the two materials. Space supports sufficiently close to prevent sags in the bundles.

- Outside storage of stainless steel reinforcing bars is acceptable. Cover the stainless steel reinforcing bars with tarpaulins.

- Store stainless steel reinforcing bars off the ground or shop floor on wooden supports and separately from carbon steel reinforcement. Space supports sufficiently close to prevent sags in the bundles.

- Do not use carbon steel tools, chains, slings, etc. when fabricating or handling stainless steel reinforcing bars. Only use nylon or polypropylene slings. Protect from contamination during construction operations including any cutting, grinding, or welding above or in the vicinity of the stainless steel bars. Flame cutting or welding of stainless steel reinforcing bars is prohibited.

- Place all stainless steel reinforcing bars on bar chairs that are solid plastic or stainless steel. Fabricate stainless steel metal chairs and continuous metal stainless steel supports from stainless steel conforming to the same requirements and UNS designations as stainless steel reinforcing bar as listed in Section B, “Materials”. Use stainless steel chairs with plastic-coated feet above steel beams.

- Use stainless steel tie wires to tie stainless steel reinforcing bars. Tie wires shall conform to the same requirements and UNS designations as stainless steel reinforcing bars as listed in Section B, “Materials”, dead soft annealed, annealed at size. The tie wire does not need to be of the same UNS designation as the bar reinforcement.

Do not tie stainless steel reinforcing bars to, or allow contact with uncoated reinforcing bars, galvanized forming hardware or attachments, or galvanized conduits. Direct contact with these materials is not acceptable. When stainless steel reinforcing bars or dowels must be near uncoated steel reinforcing bars, galvanized forming hardware, or other galvanized metals, maintain a minimum 1-inch clearance between the two metals. Where insufficient space exists to maintain this minimum, sleeve the bars with a continuous 1/8-inch minimum thickness polyethylene or nylon tube extending at least 1 inch in each direction past the point of closest contact between the two dissimilar bars and bind them with nylon or polypropylene cable ties. Sleeves are not required between stainless steel reinforcing bars and welded girder shear studs. Stainless steel reinforcing bars are allowed to be in direct contact with undamaged epoxy-coated reinforcing bars.

Uncoated fasteners (such as used for static safety lines on beams), anchors, lifting loops, etc., that extend from the top flange of prestressed concrete beams into the bridge deck shall be completely removed or cut off flush with the top flange of the beam prior to casting the deck.

C.2 Splices

Splices shall be as shown in the plans. Substitution of stainless steel mechanical splices in lieu of lap slices shown on the plans may be permitted in certain situations subject to written approval by the engineer. Provide mechanical splices for stainless steel reinforcing bars made of stainless steel conforming to one of the UNS designations listed in section B, "Materials" and meeting the minimum capacity, certification, proof testing and written approval requirements of standard spec 550.3.3.4.

If it is necessary or the contractor elects to increase or alter the number or type of bar splices from those indicated in the plans, provide copies of plan sheets to the engineer showing the revised reinforcement layout, type, length and location of revised bar splices and revised bar lengths. The engineer must approve the location of new lap splices or substitution of mechanical bar couplers in lieu of bar lap splices prior to fabrication. New lap splices must be at least as long as those shown in the plans.

D Measurement

The department will measure Bar Steel Reinforcement HS Stainless Bridges by the pound acceptably completed. The department will compute the stainless steel bar weight using the standard weight per foot of equivalent size carbon steel reinforcing bars (ASTM A615) regardless of which stainless steel alloy is provided.

If the contractor is permitted to alter the reinforcement layout per C.2, no adjustment to the reinforcement bar quantity will be made for such alterations. Mechanical bar couplers that are provided but not shown in the plans are included in the item Bar Steel Reinforcement HS Stainless Bridges and will not be measured separately.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0085.4300	Bar Steel Reinforcement HS Stainless Bridges	LB

Payment is full compensation for providing, transporting and placing the stainless steel reinforcing bars with all component materials as described above.

If the contractor is permitted to alter the reinforcement layout per C.2, no additional compensation will be made for such alterations. Mechanical bar couplers that are provided, but not shown in the plans are included in the item Bar Steel Reinforcement HS Stainless Bridges and will not be paid for separately.

297. Post-Tensioning Integral Pier Cap, Item SPV.0085.4310.

A Description

The work under this section shall consist of furnishing, installing, post-tensioning, and grouting of post-tensioning tendons in accordance to the details shown on the plans, standard spec 503, and these Special Provisions

Post-tensioned concrete members consist of the furnishing, installing, stressing, and grouting of prestressing tendons. In this process prestressing steel, which may be strands, wires, or bars, is installed through preformed voids or ducts in the concrete, is stressed up to a predetermined load, and is anchored directly against the hardened concrete, initially imparting stresses through end bearing. Grout is then injected into the ducts to completely fill all remaining voids and to seal the permanently stressed tendons.

A.1 Terms Used

Post-Tensioning: The application of a compressive force to the concrete by stressing tendons or bars after the concrete has been cast and cured. The force in the stressed tendons or bars is transferred to the concrete by means of anchorages.

Post-Tensioning Scheme or Layout: The pattern, size, and locations of post-tensioning tendons provided by the designer on the Contract Plans.

Post-Tensioning System: A proprietary system where the necessary hardware (anchorages, wedges, strands, bars, couplers, etc.) is supplied by a particular manufacturer or manufacturers of post-tensioning components.

Tendon: A high strength steel member made up of a number of strands, wires or bars.

Strand: An assembly of several high strength steel wires wound together. Strands usually have six outer wires helically wound around a single straight wire of a similar diameter.

Wire: A single, small diameter, high strength steel member and normally the basic component of strand, although some proprietary post-tensioning systems are made up of individual or groups of single wires.

Bar: Post-tensioning bars are high strength steel bars, normally available from 0.625 to 2.5 inches (15 mm to 64 mm) dia. and usually threaded with very coarse thread.

Coupling: The means by which the prestressing force may be transmitted from one partial - length prestressing tendon to another.

Anchorage: An assembly of various hardware components, which secure a tendon at its ends after it has been stressed and imparts the tendon force into the concrete.

Anchor Plate: That part of the anchorage, which bears directly on the concrete and through, which the tendon force is transmitted.

Wedges: A small conically shaped steel component placed around a strand to grip and secure it by wedge action in a tapered hole through a wedge plate.

Wedge Plate: A circular steel component of the anchorage containing a number of tapered holes through which the strands pass and are secured by conical wedges.

Set (Also Anchor Set or Wedge Set): Set is the total movement of a point on the strand just behind the anchoring wedges during load transfer from the jack to the permanent anchorages. Set movement is the sum of slippage of the wedges with respect to the anchorage head and the elastic deformation of the anchor components. For bars, set is the total movement of a point on the bar just behind the anchor nut at transfer, and is the sum of slippage of the bar and the elastic deformation of the anchorage components.

Anticipated Set: Anticipated set is that set which was assumed to occur in the design calculation of the post-tensioning forces immediately after load transfer.

Grout: A mixture of cementitous materials and water, with or without mineral additives, admixtures or fine aggregate, proportioned to produce a material that can be pumped without segregation of the constituents; injected into the duct to fill the space around the tendon.

Vent: Tubing or duct, which can be used for the injection of grout to allow air, water, grout and bleed water from the duct.

Duct: Material forming a conduit to accommodate the tendon installation and provide an annular space for the grout which protects the steel.

A.2 Alternate Post-Tensioning Designs

Alternate designs using a post-tensioning scheme other than that shown on the Plans may be submitted by the contractor for the engineer's approval provided that the proposed alternate scheme fulfills the following requirements:

- The prestress system is a type described in Section A.3.
- The net compressive stress in the concrete after all losses is at least as large as that provided by the scheme shown on the Plans.
- The distribution of individual tendons at each cross section generally conforms to the distribution shown on the Plans.
- The ultimate strength of the structure with the proposed post-tensioning scheme meets the requirements of Section 5 of the AASHTO LRFD Bridge Design Specifications, current Edition including all Interim Specifications; and shall be equivalent to the ultimate strength provided by the original design.
- Stresses in the concrete and prestressing steel at all sections and at all stages of construction meet the requirements of the Design Criteria noted on the Plans.
- All provisions of the Design Criteria noted on the Plans shall be satisfied.

- The contractor fully redesigns and details, as required, the elements where the alternate post-tensioning scheme is proposed to be used.
- The contractor submits complete Shop Drawings including post-tensioning scheme and system, reinforcing steel, and concrete cover; and design calculations (including short and long term prestress losses) for the engineer's approval. These drawings and calculations shall be certified by a registered professional engineer in the State of Wisconsin who can show experience with the proposed alternate scheme to the satisfaction of the engineer.
- Any alternate post-tensioning scheme or system approved by the engineer, which results in a change in quantity from that shown on the Plans, shall be paid based on the quantity actually used and accepted or the plan quantity, whichever is less, at the unit bid price.

A.3 Shop Drawings

Prepare Shop Drawings for the post-tensioning system. Prepare in accordance to the following provisions as well as standard spec 105.2.

Submit checked detailed Shop Drawings, which include, but are not limited to, the following:

- A complete description of all details covering each of the post-tensioning systems to be used for permanent tendons.
- Designation of the specific post-tensioning steel, anchorage devices, sheathing material, and accessory items to be used.
- Size and type of ducts for all post-tensioning tendons and their horizontal and vertical profiles shall be clearly detailed. Duct supports and grout tubes and vents shall be shown including size, type and location.
- The details of the anchorage systems.
- A table giving jacking sequence, jacking forces and initial elongation, and estimates of anchor sets of the tendons at each stage of erection for all post-tensioning.
- Parameters to be used to calculate the typical tendon force such as expected friction coefficients, anchor set, and post-tensioning relaxation curves.
- Details and a complete description of the post-tensioning system to be used. Prestressing details shall include method, sequence, and procedure of prestressing, securing tendons, release procedures and equipment.
- Certified copies of reports covering tests performed on post-tensioning steel and anchorages devices as required by Section B.2.2 of this Specification.
- Information regarding the grout mix design, the method of mixing and placing the grout and the type and capacity of equipment to be used.

B Materials

Furnish material that is according to the following specifications.

B.1 Prestressing Material

B.1.1 Prestressing Steel

The proper use of strand, bars and wires is predicated upon the use of suitable accessory materials. Details for the use of these materials shall be furnished by the manufacturer in connection with Shop and Working Drawing submittals.

Strand: Unless otherwise noted on the Plans, strand shall be uncoated, Grade 270 (1860 MPa), low relaxation 7-wire strand conforming to the requirements of AASHTO M 203.

Bar: Unless otherwise noted on the Plans, bar shall be uncoated, Grade 150 (1035 MPa), high strength, coarse thread bar conforming to the requirements of AASHTO M 275.

B.1.2 Prestress Anchorages

All prestressing steel shall be secured at the ends by anchoring devices meeting the approval of the engineer. The anchoring devices shall effectively distribute tendon forces to the concrete and shall satisfy the anchor efficiency test and acceptance test in accordance to Article 10.3.2 of AASHTO LRFD Construction Specifications current edition and latest interim. The anchorages shall develop at least 95 percent of the minimum specified ultimate tensile strength of the prestressing steel, tested in an unbonded state without exceeding the anticipated set. Certified copies of test results for the anchorage system of each different anchor type or size shall be supplied to the engineer at no additional cost. The anchorage shall be so arranged that the prestressing force in the tendon may be verified prior to the removal of the stressing equipment.

For single plate anchors the design shall conform to the following requirements (A and B):

- The concrete bearing stress shall not exceed the allowables specified in Section 5.10.9.3 “Design 0f the General Zone” of ASSHTO LRFD Bridge Design Specifications current edition and interims. Calculations shall be furnished to the engineer for each bearing type and/or size of anchor device supplied.

- The bending stresses in the plates or assemblies induced by the pull of the prestressing steel shall not exceed the yield point of the material or cause visible distortion of the anchorage plate when 95 percent of the ultimate strength of the tendon is applied. Certified test reports from an approved independent testing laboratory, verifying compliance with this requirement, shall be provided to the engineer for each type and/or size of anchoring device.

Alternatively, multi-plane anchorage devices which do not meet with the above requirements (A and B) may be accepted based upon previously approved usage by the department, or on the basis of new or previous tests performed in accordance to and meeting the requirements of the 1999 AASHTO Guide Specifications for the Design and Construction of Segmental Concrete Bridges, Division II, Section 4.2 "Special Anchorage Devices", all at no cost to the department. Also, in such cases, any additional confinement reinforcement or modifications to existing reinforcement required for satisfactory performance of the anchorage devices shall be incorporated in the structure at no

additional cost. Certified test reports from an approved independent testing laboratory, verifying compliance with this requirement, shall be provided to the engineer for each type and/or size of anchoring device.

The contractor's use of an anchorage design using two part wedges shall be immediately discontinued if these wedges show any sign of slippage, or if they fail to grip the tendon without exceeding the anticipated set. The contractor shall be required to furnish and use acceptable three part wedges for anchoring post-tensioning strands if two part wedges are rejected at no additional cost to the department.

B.1.3 Bar Couplers

For permanent applications, the use and location of bar couplers shall be subject to approval by the engineer. Where bars are extended by the use of couplers, the assembled units shall develop at least 95 percent of the manufacturer's minimum specified ultimate tensile strength of the bar, tested in an unbonded state without exceeding the anticipated set.

B.1.4 Ducts

Unless specifically noted on the Plans or otherwise approved by the engineer, ducts for post-tensioning shall conform to the requirements of this specification.

Ducts embedded in the concrete for prestressing steel shall be high density virgin polyethylene. Ferrous metal ducts are not permitted. Embedded ducts shall be corrugated.

Ducts, pipes, and all connections shall be capable of withstanding the pressure required for pre-grouting air pressure test and for flushing the ducts in the event of an aborted grouting operation.

B.1.4.1 Size of Ducts

Ducts for multi-strand, multi-bar, or multi-wire tendons shall have an inside area at least 2.5 times the net area of the tendon. Ducts for single strand, single bar, or single wire tendons shall have an inside diameter at least 3/8 inch (10 mm) larger than the nominal diameter of the strand, bar, or wire.

B.1.4.2 Ferrous Metal Ducts

Do not use Ferrous Metal Ducts.

B.1.4.3 Epoxy Coated Metal Ducts

Do not use Epoxy Coated Metal Ducts.

B.1.4.4 Polyethylene (P.E.) Ducts and Pipes

Ducts and pipes shall be sufficiently rigid to withstand placement of concrete, grouting, and construction loads without damage or excessive deformation, and shall be watertight. Corrugated ducts shall be in accordance to ASTM Designation D 3350 with a cell classification PE345433C. Rigid smooth walled polyethylene pipes shall be in accordance to ASTM Designation D 1248, Type III, Grade 34, Cat.5.

Plastic material used shall not react with concrete, shall not enhance corrosion of prestressing steel, and shall be free of water soluble chloride.

Smooth pipes shall not be used in locations embedded in the concrete.

B.1.4.5 Steel Pipes
Where called for on the Plans, steel pipes shall conform to ASTM A-53, Grade B Schedule 40. The steel pipes shall be galvanized.

B.1.5 Grout Vents, Injection and Ejection Pipes
Vents shall be ¾ inch (20 mm) minimum diameter suitable plastic pipe. Plastic components shall not react with the concrete or enhance corrosion of the prestressing steel. Plastic components shall be free of water soluble chlorides.

Grout injection pipes shall be fitted with positive mechanical shut-off valves. Vents and ejection pipes shall be fitted with valves or other devices capable of withstanding the grout pumping pressures.

B.1.6 Grout
Grouts shall be prebagged in plastic lined or coated bags. Stamp grout bags with date of manufacture, lot number and mixing instructions. Any change of materials or material sources requires retesting and certification of the conformance of the grout with the physical properties requirements. A copy of the Quality Control Data Sheet for each lot number and shipment sent to the job site shall be provided to the contractor by the grout supplier and furnished to the engineer.

Materials with a total time from manufacture to usage in excess of six months shall be retested and certified by the supplier before use or shall be removed and replaced.

Manufacturers of post-tensioning grout seeking evaluation of their product shall submit material to the WisDOT Materials Laboratory for testing and shall provide certified test reports from an audited and independent Cement and Concrete Reference Laboratory (CCRL) which shows the material meets all the requirements specified herein.

The material shall be mixed in accordance to the manufacturer's recommendations. Grouts shall achieve a non-bleeding characteristic.

Grouts shall contain no aluminum powder.

The water content shall be the minimum necessary for proper placement, and shall not exceed a water-cement ration of 0.35.
Grouts and temporary corrosion protection methods shall not involve toxic substance. Grout shall meet or exceed the specified physical properties stated herein as determined by the following standard and modified ASTM test methods.

Property	Test Value	Test Method
Total Chloride Ions	Max. 0.08% by weight of cementitious material	ASTM C 1152
Fine Aggregate (if utilized)	Max Size <= No. 50 Sieve (300 micron)	ASTM C 33
Volume Change @ 28 days	0.0% Shrinkage @ 24 hours <=0.3% Expansion @ 28 days	ASTM C 1090 *
Expansion	<= 2.0% for up to 3 hours	ASTM C 940
Compressive Strength @ 28 days (Average of 3 cubes)	>= 5,000 psi (34.5 Mpa)	ASTM C 942
Initial Set of Grout	Min. 3 hours Max. 12 hours	ASTM C 953
Fluidity Test ** Efflux Time from Flow Cone		
(a) Immediately after mixing	Min. 11 sec. Max. 30 sec.	ASTM C 939 ASTM C 939 ***
	or Min. 9 sec. Max. 20 sec.	ASTM C 939 ***
(b) 30 minutes after mixing with remixing for 30 sec.	Max. 30 sec.	ASTM C 939
	Or Max. 30 sec.	ASTM C 939 ***
Bleeding @ 4 hours	Max. 0% Max. 2% at 43.5 psi (300 kPa)	ASTM C 940 **** Schupack *****
Permeability @ 28 days	Max. 2500 coulombs at 30 V for 6 hours	ASTM C 1202

* Modify ASTM C 1090 to include verification at both 24 hours and 28 days.

** Adjustments to flow rates will be achieved by strict compliance with the manufacturer's recommendations.

*** Grout fluidity shall meet either the standard ASTM C 939 flow cone test or the modified test described herein. Modify the ASTM C 939 test by filling the cone to the top instead of the standard level. The efflux time is the time to fill a one quart (one liter) container placed directly under the flow cone.

**** Modify ASTM C 940 to conform with the wick induced bleed test described below.

- Condition dry ingredients, mixing water, prestressing strand and test apparatus overnight at 70 to 75°F (21 to 24°C).
- Insert 0.21 gal (800 ml) of mixed conditioned grout with conditioned water into the 0.26 gal (1,000 ml) graduated cylinder. Mark the level of the top of the grout.
- Wrap the strand with 2 inch (50.8 mm) wide duct or electrical tape at each end prior to cutting to avoid splaying of the wires when it is cut. Degrease (with acetone or hexane solvent) and wire brush to remove any surface rust on the strand before temperature conditioning. Insert completely a 20 inch (508 mm) length of conditioned, cleaned, AASHTO M203, Grade 270 (1860 MPa), seven wire strand (1/2 inch (13 mm) diameter) into the 0.26 gal (1,000 ml) graduated cylinder (possibly using a centralizer). Mark the level of the top of the grout.
- Store the mixed grout at the temperature range listed above in (a).
- Measure the level of the bleed water every 15 minutes for the first hour and hourly afterward for four hours.
- Calculate the bleed water, if any, at the end of the four hour test period and the **resulting** expansion per the procedures outlined in ASTM C 940, with the quantity of bleed water expressed as a percent of the initial grout volume. Note if the bleed water remains above or below the top of the grout.

***** Schupack Pressure Bleed Test Using the Gelman Filtration Funnel

- Grouts shall be mixed in accordance to ASTM C938, "Practice for Proportioning Grout Mixtures for Preplaced-Aggregate Concrete.
- Fill the filtration funnel hand tight, while keeping funnel in upright position.
- Place funnel in frame.
- Connect air supply (air pressure at 0 psi (0 kPA)).
- Allow grout to rest in funnel for 10 minutes.
- Increase pressure to 43.5 psi (300 kPa).
- Hold at specified pressure for 5 minutes and record bleed volume to the nearest 0.00005 gal (0.2 ml) at the end of hold time.
- Bleed volume shall be reported as a percentage of the sample volume:
- % bleed = [bleed (gal) x 100] / 0.053 gal
- (% bleed = [bleed (ml) x 100] / 200 ml)

If a loss of pressure occurs prior to completion of step (h), the test is considered to have failed for the given pressure level.

B.2 Testing

Testing shall conform to the applicable ASTM Specifications for the prestressing material used. All material samples for testing shall be furnished by the contractor at no cost to the department. Job site or site referred to herein shall be considered the location where the prestressing steel is to be installed whether at the bridge site or a remote casting yard.

B.2.1 Testing of Prestressing Steel and Components

Certified mill reports on the prestressing steel used shall be submitted to the engineer for each lot of post-tensioning steel, and shall show the ultimate strength, modulus of

elasticity, and percent elongation at rupture. These reports are required for strand as well as bars.

Two certified test reports as required in Section B.1.2 are required for each anchor type and size. This is required for both strand and bar anchors. The first report verifies that the anchor can support 95 percent of the ultimate force for that tendon in a unbonded state. The second submission depends on the anchor type. If the anchor is a single plate anchor, then calculations are required to verify the anchor satisfies the bearing stresses defined in Section B.1.2. If the anchor is a multi-plate type, then certified test reports are required showing the anchor satisfied the "Special Anchorage Devices" in Section B.1.2.

B.2.2 Lots and Identification

A lot is that parcel of components as described herein. All bars, anchorage assemblies, and couplers of each size from each mill heat of steel, and all strand from each manufactured reel to be shipped to the site shall be assigned an individual lot number and shall be tagged in such a manner that each such lot can be accurately identified at the job site. Records shall be submitted to the engineer identifying assigned lot numbers with the heat, coil, or reel of material represented. All unidentified prestressing steel, anchorage assemblies or bar couplers received at the site will be rejected. Loss of positive identification of these items at any time will also be cause for rejection.

B.2.3 Release of Materials

The release of any material by the engineer shall not preclude subsequent rejection if the material is damaged in transit or later damaged or found to be defective.

B.2.4 Testing by the Contractor

B.2.4.1 In-Place Friction Test

This test is intended to demonstrate that the friction characteristics, losses, and resulting tendon forces are in agreement with the design assumptions. This test is only required if authorized by the engineer in order to resolve discrepancies between actual and theoretical elongations in excess of 7 percent.

The test procedure shall consist of stressing the tendon at an anchor assembly with a load cell at the dead end. The test specimen shall be tensioned to 80 percent of ultimate tendon strength in eight equal increments and detensioned in eight equal decrements. For each increment and decrement, the gauge pressure, elongations, and load cell force shall be recorded. Account shall be taken of any wedge seating in both the live end (i.e., back of jack) and the dead end (i.e., back of load cell) and of any friction within the anchorages, wedge plates, and jack as a result of slight deviations of the strands through these assemblies. For long tendons requiring multiple jack pulls with intermediate temporary anchoring, care shall be taken to keep an accurate account of the elongation at the jacking end allowing for intermediate wedge seating and slip of the jacks' wedges.

The test shall be conducted using the lubricants required, if any, to meet the expected friction coefficient.

If, for the contractor's expected friction coefficients, the elongations fall outside the plus or minus 7 percent range, the contractor shall investigate the reason and make revisions to their post-tensioning operations such that the final tendon forces are in agreement with the Plans.

In reconciling theoretical and actual elongations, the value of the expected friction and wobble coefficients shall not be varied by more than plus or minus 10 percent. Significant shortfall in elongations is indicative of poor duct alignments and/or obstructions which the contractor shall correct or compensate for in a manner to be proposed by the contractor and reviewed and approved by the engineer, at no additional cost to the department.

If, during the course of routine stressing operations, there are irreconcilable differences between forces and elongations, or other difficulties, the engineer reserves the right to require additional in place friction tests.

The apparatus and methods used to perform the test shall be proposed by the contractor and shall be subject to the approval of the engineer. Furthermore, this test shall be conducted by the contractor in the presence of the engineer.

Correction or adjustment of elongations as a consequence of the results of the friction test are the responsibility of the originator of the stressing and elongation calculations.

B.2.5 Tests Reports Required

Two test reports of the In Place Friction Test shall be submitted to the engineer within two weeks after the test has been performed. Revisions to the theoretical elongations shall be submitted to the engineer for approval.

B.2.6 Payment for Testing

Testing by the contractor will not be paid for separately but shall be incidental to the price paid for the post-tensioning.

C Construction

C.1 Protection of Prestressing Steel.

C.1.1 Shipping, Handling, and Storage

Protect all prestressing steel against physical damage and corrosion at all times from manufacturer to final grouting or encasing in the concrete. Prestressing steel that has sustained physical damage at any time shall be rejected. Any reel that is found to contain broken wires shall be carefully inspected during use and lengths of strand containing broken wires shall be removed and discarded. The wire shall be bright and uniformly colored, having no foreign matter or pitting on its surface.

Package prestressing steel in containers or shipping forms for protection of the steel against physical damage and corrosion during shipping and storage. A corrosion inhibitor, which prevents rust or other results of corrosion, shall be placed in the package or form, or shall be incorporated in a corrosion inhibitor carrier type packaging material, or when permitted by the engineer, may be applied directly to the steel. The corrosion

inhibitor shall have no deleterious effect on the steel or the concrete or bond strength of steel to concrete. Inhibitor carrier type packaging material shall conform to the provisions of Federal Specification MIL-P-3420. Packaging or forms damaged by any cause shall be immediately replaced or restored to the original condition.

The shipping package or form shall be clearly marked with a statement that the package contains high-strength prestressing steel, the care to be used in handling, and the type, kind, and amount of corrosion inhibitor used, including the date when placed, safety orders, and instructions for use. Low relaxation (stabilized) strand shall be specifically designated per requirements of AASHTO M 203. All such strand not so designated shall be rejected.

C.1.2 During Installation in the Structure

When acceptable prestressing steel for post-tensioning is installed in the ducts after completion of concrete curing and if stressing and grouting are completed within twenty calendar days after the installation of the prestressing steel, rust which may form during these twenty days will not be cause for rejection of the steel. Post-tensioning steel installed, tensioned, and grouted in this manner, all within twenty calendar days, will not require the use of a corrosion inhibitor in the duct following installation of the prestressing steel.

For post-tensioning steel installed in ducts prior to concrete placement, the above time shall be reckoned from the day of first installation in the ducts.

Post-tensioning steel installed as above but not grouted within twenty calendar days shall have an approved water soluble oil corrosion inhibitor (emulsified rust passivator) applied in the ducts and shall be subject to all the requirements in this Section pertaining to corrosion protection and rejection because of rust. Immediately prior to grouting, the water soluble oil shall be thoroughly flushed from the ducts with water, and the ducts and tendons shall then be thoroughly dried by air blown into the ducts.

Within 30 calendar days after installation of the post-tensioning steel, ducts shall be grouted in accordance to these Specifications. Except when approved by the engineer in writing, failure to grout tendons within the 30 calendar days specified shall result in stoppage of the affected work and no invoices shall be processed for payment of that affected work.

C.2 Fabrication of Post-tensioning Ducts and Anchorages in the Final Structure.

All post-tensioning anchorages, ducts, vent pipes, miscellaneous hardware, reinforcing bars, and other embedments shall be accurately and securely fastened at the locations shown on the Plans, on the approved Shop or Working Drawings, or as otherwise approved by the engineer.

C.2.1 Ducts

Ducts shall be accurately aligned and positioned at the locations shown on the Plans, according to the approved Shop or Working Drawings, or as otherwise approved by the engineer. All internal ducts shall be securely fastened in position at regular intervals not

exceeding three feet to prevent movement, displacement, or damage from concrete placement and consolidation operations. The method and spacing of duct supports shall be shown on appropriate Shop Drawings.

All alignments, including curves and straight portions, shall be smooth and continuous with no lips, kinks, or dents. All ducts shall be carefully checked and repaired as necessary before the placing of any concrete commences. The tolerance on the location of the ducts for the tendons shall be as specified below.

After installation in the forms, all ends of ducts, connections to anchorages, splices, vents, and the like shall at all times be sealed to prevent the entry of water and debris.

C.2.2 Splices and Joints

At splices and joints, and connections to anchorages, ducts shall be smoothly aligned and secured with no lips or kinks. They shall be joined in a manner, which positively prevents the entrance of cement paste and water from the concrete or unwanted leakage of grout during subsequent grouting operations.

C.2.3 Grout Vents, Injection and Ejection Pipes

All ducts or anchorage assemblies for permanent post-tensioning shall be provided with pipes or other suitable connections at each end for the injection of grout after prestressing. Vents shall be placed in the following locations:

- At the anchorage area of the tendon.
- At the high points of the duct, when the vertical distance between the highest point and lowest point is more than 20 inches (500 mm).
- An vent shall be placed at or near the lowest point of a tendon.
- Outlets shall be placed at all low points, and shall be free draining.
- At major changes in the cross-section of the duct, such as couplers and anchorages. In addition, one grout vent shall be placed approximately 3 feet (1 m) downstream from the high point vent.

The contractor may use additional injection and vent pipes only when shown on the approved Shop Drawings.

All connections to ducts shall be made with plastic structural fasteners. Waterproof tape shall be used at all connections to include vent and grouting pipes. Vents shall be mortar tight, taped as necessary, and shall provide means for injection of grout through the vents and for sealing the vents.

Grout injection pipes shall be fitted with positive mechanical shut-off valves. Vents and ejection pipes shall be fitted with valves, caps, or other devices capable of withstanding the grout pumping pressures.

All grout caps used must be installed to prevent entrapment of air or water voids and must provide 100 percent coverage of all tendons.

C.2.4 Tolerances

Post-tensioning ducts shall be positioned within the tolerances given below:

Table of Duct Position Tolerances		
Tolerances in inches (mm) for:	Vertical position	Lateral position
Longitudinal Tendons in Integral Bent Cap	± 1/4 (±6)	± 1/2 (±12)

Entrance and exit angles of tendon paths at anchorages and/or at faces of concrete shall be within 3 degrees (5 percent) of desired angle measured in any direction.

Angle changes at duct joints shall not be greater than 3 degrees (5 percent) in any direction.

Anchorages shall be located within ± ¼ inches (±6 mm) of desired position laterally and
±1 inch (±25 mm) along the tendon except that minimum cover requirements to ends of cut off tendons and anchor components must be maintained.

Anchorage confinement reinforcement in the form of spirals, multiple U shaped bars or links, shall be positioned to start within ½ inches (12 mm) of the back of the main anchor plate, providing the anchorage is to be encased or sealed later in the construction, and shall be properly centered around the duct.

In the event of conflicts between the reinforcement and post-tensioning duct, in general, the position of the post-tensioning duct shall prevail and the reinforcement shall be adjusted locally to the approval of the engineer.

C.3 Placing Concrete

C.3.1 Precautions

The contractor shall exercise great care when placing and consolidating concrete so as not to displace or damage any of the post-tensioning ducts, anchorage assemblies, splices and connections, reinforcement, or other embedments.

C.3.2 Proving of Post-Tensioning Ducts

Upon completion of concrete placement, the contractor shall verify that the post-tensioning ducts are free and clear of any obstructions or damage and will be able to accept the intended post-tensioning tendons. If the ducts are found to be deformed such that the tendons cannot be placed, the member shall be rejected unless a workable repair can be made to clear the duct, all to the satisfaction of the engineer.

C.3.3 Problems and Remedies

If the ducts or any part of the work is found to be deficient, it will be rejected. No remedial or repair work will be permitted without the approval of the engineer. Any remedial work will be completed at no additional cost to the department.

C.4 Installing Tendons.
Post-tensioning strands may be pushed or pulled through the ducts to make up a tendon. Pushing shall be done with care so as to avoid snagging on any lips or joints in the ducts. The contractor shall take precautions by rounding off the end of the strand or fitting it with a smooth protective cap for this purpose.

Alternatively, strands may be assembled into the tendon, which then may be pulled through the duct together using a special steel wire sock ("Chinese finger") or other device attached to the end. Also, the ends of the strands may be welded together for this purpose. If so, then the end of the bundle must be rounded for smooth passage and the entire welded end together with at least 30 inches (750 mm) of tendon beyond the end of the last weld shall be cut off and wasted. Cutting shall be done with an abrasive saw or similar. Flame cutting shall not be allowed.

In accordance to these Specifications, the time requirements for corrosion protection shall commence from the time the strands were first placed in the ducts and not from the time of concrete placement.

C.5 Post-Tensioning Operations.
Post-tensioning forces shall not be applied until the concrete has attained the specified compressive strength as determined by cylinder tests.

The stressing of post-tensioning tendons shall be under the immediate supervision of a qualified representative of the post-tensioning specialty contractor, who shall exercise rigid control of the operations as necessary for full compliance with all requirements. As a minimum, the representative shall be present at the beginning of each different type of post-tensioning operation. If the representative determines that the contractor's crew is thoroughly familiar with one type of operation, he/she may deliver a signed statement of competence for the crew to the engineer. In such case, the presence of the representative shall not be required again until a different type of post-tensioning operation occurs. The statement shall list the names of the contractor's crew and crew leader. The stressing operations shall be overseen by the contractor's crew leader, who shall demonstrate competence in supervising the stressing operations and performing elongation measurements and calculations, and shall preferably be an engineer. No stressing operations shall be performed without direct supervision of the representative or the contractor's approved crew leader.

C.5.1 Stressing Tendons
All post-tensioning steel shall be tensioned by means of hydraulic jacks so that the post-tensioning force shall not be less than that required by the Plans, approved Shop Drawings, or as otherwise approved by the engineer. Monostrand jacks shall not be utilized for stressing tendons unless approved by the engineer.

The maximum temporary stress (jacking stress) in the post-tensioning steel shall not exceed 80 percent of its specified minimum ultimate tensile strength. Tendons shall not be overstressed to achieve the expected elongation.

The post-tensioning steel shall be anchored at initial stresses that will result in the long term retention of permanent stresses or forces of not less than those shown on the Plans or the approved Shop Drawings. Unless otherwise approved by the engineer, the initial stress after anchor set shall not exceed 70 percent of the specified ultimate tensile strength of the post-tensioning steel.

Permanent stress and permanent force are the stress and force remaining in the post-tensioning steel after all losses, including long term creep and shrinkage of concrete, elastic shortening of concrete, relaxation of steel, losses in the post-tensioning steel from the sequence of stressing, friction and unintentional wobble of the ducts, anchor set, friction in the anchorages, and all other losses peculiar to the post-tensioning system.

C.5.2 Stressing Sequence

The Plans show the sequence, the phase and the end from which tendons must be stressed. The contractor shall not modify the stressing sequence shown on the Plans without approval from the engineer.

C.5.3 Stressing Equipment

Equipment for tensioning the tendons shall be furnished by the manufacturer of the post-tensioning system (tendons, hardware, anchorages, etc.).

C.5.4 Stressing Jacks and Gauges

Each jack used to stress tendons shall be equipped with a pressure gauge for determining the jacking pressure. The pressure gauge shall have an accurately reading dial at least 6 inches (150 mm) in diameter.

Each jack and its gauge shall be calibrated as a unit, with the cylinder extension in the approximate position it will be in at the final jacking force. Calibration shall be done when the jack is connected to the equipment (pumps and gauges) in the identical configuration to be used on the job site, e.g. with the same length hydraulic lines. Initial calibration of the jacks and gauges shall be performed by an independent laboratory using a proven load cell. For each jack and gauge unit used on the project, certified calibration charts shall be furnished by the contractor from the independent laboratory prior to stressing the first tendon.

Certified calibration shall be made at the start of the work and at every six months thereafter, or as requested by the engineer. At the option of the contractor, calibrations subsequent to the initial calibration with a load cell may be accomplished by the use of a master gauge. The master gauge shall be supplied by the contractor in a protective waterproof container capable of protecting the calibration of the master gauge during shipment to a laboratory. The contractor shall provide a quick-attach coupler next to the permanent gauge in the hydraulic lines, which enables the quick and easy installation of the master gauge to verify the permanent gauge readings. The master gauge shall be calibrated by and shall remain in the possession of the engineer for the duration of the project.

Any repair of the jacks, such as replacing seals or changing the length of the hydraulic lines, is cause for recalibration of the jacks using a load cell.

No extra compensation shall be allowed for the initial or subsequent calibrations, or for the use and required calibrations of the master gauge.

C.5.6 Elongations and Agreement with Forces

The post-tensioning operation shall be so conducted that the forces being applied to the tendon and the elongation of the post-tensioning tendon can be measured at all times. Elongations shall be measured to the nearest 1/16 inch (2 mm).

For the required tendon force, the observed elongation shall agree within seven percent of the theoretical elongation, or the entire operation shall be checked and the source of error determined and remedied to the satisfaction of the engineer before proceeding further. The tendon shall not be overstressed to achieve the theoretical elongation.

In the event that agreement between the observed and theoretical elongations at the required force falls outside the acceptable tolerances, the engineer may, at their discretion and without additional compensation to the contractor, require "In Place Friction Test" in accordance to Section B.2.1.

C.5.7 Friction

The Contract Plans were prepared based on the assumed friction and wobble coefficients and anchor set noted on the Plans. The contractor shall submit calculations and show a typical tendon force diagram, after friction, wobble, and anchor set losses, on the Shop Drawings based upon the expected actual coefficients and values for the post-tensioning system to be used. These coefficients and values shall be given on the Shop Drawings.

If, in the opinion of the engineer, the actual friction significantly varies from the expected friction, the contractor shall revise their post-tensioning operation such that the final tendon force is in agreement with the Plans.

When friction must be reduced, water soluble oil or graphite may be used as a lubricant subject to the approval of the engineer. Lubricants shall be flushed from the duct as soon as possible after stressing is completed by use of water pressure. These ducts shall be flushed again just prior to the grouting operations. Each time ducts are flushed, they shall be immediately blown dry with oil free air.

C.5.8 Wire Failures in Post-Tensioning Tendons

Multi-strand post-tensioning tendons having wires, which failed by breaking or slippage during stressing, may be accepted provided the following conditions are met:

- The completed structure shall have a final post-tensioning force of at least 98 percent of the design total post-tensioning force.
- Any single tendon shall have no more than a five percent reduction in cross-sectional area of post-tensioning steel due to wire failure.

As an exception, any of the above conditions may be waived as approved by the engineer when conditions permit the contractor to propose acceptable alternative means of restoring the post-tensioning force lost due to wire failure.

C.5.9 Cutting of Post-Tensioning Steel

Post-tensioning steel shall be cut by an abrasive saw within ¾ to 1½ inches (20 to 40 mm) away from the anchoring device. Flame cutting of post-tensioning steel is not allowed.

C.5.10 Record of Stressing Operations

The contractor shall keep a record of the following post-tensioning operations for each tendon installed:

- Project name, number.
- Contractor and/or subcontractor.
- Tendon location, size, and type.
- Date tendon was first installed in ducts.
- Reel number for strands and heat number for bars.
- Assumed and actual cross-sectional area.
- Assumed and actual Modulus of elasticity.
- Date Stressed.
- Jack and Gauge serial numbers per stressing operation.
- Required jacking force.
- Gauge pressures.
- Elongations (anticipated and actual).
- Anchor sets (anticipated and actual).
- Stressing sequence.
- Stressing mode (one end/ two ends/ simultaneous).
- Witnesses to stressing operation (Contractor and inspector).
- Date grouted, days from stressing to grouting, grouting pressure applied, and injection end.

Any other relevant information shall also be recorded. The contractor shall provide the engineer with a complete copy of all stressing and grouting operations.

C.6 Grouting Operations

Within 30 calendar days after installation of the post-tensioning steel, ducts shall be grouted in accordance to these Specifications. Except when approved by the engineer in writing, failure to grout tendons within the 30 calendar days specified shall result in stoppage of the affected work and no invoices shall be processed for payment of that affected work.

After stressing and prior to grouting, tendons shall be protected against corrosion or harmful effects of debris by temporarily plugging or sealing all openings and vents until the tendon is grouted.

When stressing has been completed and the stressed tendons have been accepted by the engineer, the annular space between the tendons and the duct shall be grouted.

Grouting operations shall be supervised, inspected and documented by qualified technician(s) and/or engineer(s) who have received training and certification under the ASBI Grout Certification Program.

C.6.1 Equipment

The grouting equipment shall include a colloidal grout mixer capable of continuous mechanical mixing, and shall produce a grout free of lumps and undispersed cement. The equipment shall be able to pump mixed grout in a manner, which will comply with all the provisions specified herein. Accessory equipment, which will provide for accurate solid and liquid measures, shall be provided to batch all materials.

Grout pumps shall be positive displacement type and shall be able to produce an outlet pressure of at least 150 psi (1035 kPa). Pumps shall have seals adequate to prevent oil, air, or other foreign substances entering into the grout and to prevent loss of grout or water. A pressure gauge having a full scale reading of no more than 300 psi (2070 kPa) shall be placed at some point in the grout line between the pumping outlet and the duct inlet. The grouting equipment shall contain a screen having clear openings of 1/8 inches (3 mm) maximum size to screen the grout prior to its introduction into the grout pump. If grout with an additive is used, a screen opening of 0.20 inches (5 mm) is satisfactory.

This screen shall be easily accessible for inspection and cleaning. The grouting equipment shall utilize a gravity feed to the pump inlet from a hopper attached to and directly over it. The hopper must be kept at least partially full at all times during the pumping operation to prevent air from being drawn into the post-tensioning duct. Under normal conditions, the grout equipment shall be capable of continuously grouting the longest tendon on the project in not more than 20 minutes.

C.6.2 Mixing

Mix the grout in accordance to the manufacturer's instructions to obtain a homogenous mixture. Perform a fluidity test on the mixed grout, in accordance to standard spec 603.19.1.5-1.6, prior to beginning the injection process. Obtain target flow rates as a function of mixer type used and ambient temperature from the grout manufacturer. Do not begin the grouting process until the proper grout properties have been obtained.

Batches shall be placed within 30 minutes of mixing.

C.6.3 Grout Injection

All grout vents and high point vent openings shall be open when grouting starts. Injection and ejection vents shall be provided with positive shut-offs. Grout shall be allowed to flow from the first vent after the injection vent until any residual flushing water or entrapped air has been removed, at which time the vent shall be closed. Remaining vents shall be closed in sequence in the same manner except that at intermediate crests, outlet placed a short distance downstream of the crest shall be closed before their associated

crest outlet. Grout shall be injected from the near the lowest end of a tendon in uphill direction.

The pumping pressure at the injection vent shall not exceed 250 psi (1725 kPa); however, normal operations shall be performed at approximately 75 psi (520 kPa). If the actual grouting pressure exceeds the maximum allowed, the injection vent shall be closed and the grout shall be injected at the next vent, which has been, or is ready to be, closed as long as a one way flow is maintained. Grout shall not be injected into a succeeding vent from which grout has not yet flowed. If this procedure is used, then the vent, which is to be used for injection, shall be fitted with a positive shut-off. When one-way flow of grout cannot be maintained as outlined above, the grout shall be immediately flushed out of the duct with water.

Grout shall be pumped through the duct and continuously wasted at the ejection vent until no visible slugs of water or air are ejected. To ensure that the tendon remains filled with grout, the ejection and injection vents shall be closed in sequence, respectively, under pressure when the tendon duct is completely filled with grout. The positive shut-offs at the injection and ejection vents shall not be removed or opened until the grout has set.

C.6.4 Temperature Restrictions

In temperatures below 32°F (0°C), ducts shall be kept free of water to avoid damage due to freezing. The temperature of the concrete shall be 36°F (2°C) or higher from the time of grouting until job cured 2 inch (50 mm) cubes of grout reach a minimum compressive strength of 800 psi (5500 kPa). Grout shall not be above 90°F (32°C) during mixing or pumping. If necessary, the mixing water shall be cooled.

C.6.5 Finishing

Valves, caps, and vent pipes shall not be removed or opened until the grout has set. The ends of steel vents shall be removed at least 1 inch (25 mm) below the concrete surface after the grout has set. Ends of plastic vents shall be removed to the surface of the concrete after the grout has set. All miscellaneous material used for sealing grout caps shall be removed prior to carrying out further work to protect end anchorages or filling in concrete anchorage blockouts and the like. Miscellaneous materials include paper, tie wire, duct tape, etc.

C.6.6 Protection of End Anchorages for Tendons

Within 54 hours after grouting is completed, exposed end anchorages, strands, and other metal accessories shall be cleaned of rust, misplaced mortar, grout, and other such materials. Immediately following the cleaning operation, a heavy unbroken coating of an epoxy bonding compound shall be applied to all such dry metal surfaces. Epoxy bonding compound shall conform to AASHTO M 235, Class III.

Tight fitting forms shall be installed and held in place securely against the previously placed concrete. After application of the epoxy bonding agent, the void between the form and the anchorage shall be filled with a non-shrink grout mix to protect the anchorage. This non-shrink grout may be Embeco, Chem-Comp, Five Star, or approved equal. The

non-shrink grout shall be placed within the "tack time" period of the epoxy bonding agent/compound.

Only non-chloride bearing non-shrink grout mixes shall be used for anchorage protection. After grout patches have been finished and cured, two heavy brush coats of bituminous protective coating material conforming with AASHTO M 115 shall be applied to the grout patch in a manner and thickness recommended by the manufacturer.

C.6.7 Inspection of Grouted Anchorages

Physical probing and inspection of anchorages shall be conducted during the construction of the first cantilever and the first span to ensure that there are no bleed water or subsidence voids. All cantilever (top deck) tendons anchoring at three joint locations representing the shortest, the medium, and the longest tendons at the first cantilever shall be inspected at 48 hours after grouting. All continuity tendons anchoring in the first span being completed shall be inspected at 48 hours after grouting. Subsequent spot inspections of one cantilever tendon and one continuity tendon per span may be conducted if directed by the engineer. Any voids discovered should be filled immediately with the approved grout. The presence and recurrence of significant voids or bleed water shall be investigated and remedial measures proposed for the engineer's acceptance. The engineer may suspend further work until the cause and remedial measures is submitted to their satisfaction. The contractor shall advise the engineer the time at which the probings and inspections are to take place in order that the engineer's representative may witness the process and results.

D Measurement

The department will measure Post-Tensioning Integral Pier Cap by the pound, acceptably completed. The quantity of post-tensioning tendons to be paid for under this Section shall be the computed weight, in pounds, of permanent post-tensioning steel tendons entered into the completed structure and accepted. Measurement shall be the theoretical plan length measured from anchor plate bearing face to anchor plate bearing face with no allowance made for waste or extension past the anchor plate faces. No measurement will be made for temporary post-tensioning, which shall be considered incidental to the item "Post Tensioning Integral Pier Cap."

For quantity determination the following unit weights shall be used:

Prestressing System	**Weight per Unit Length**
0.50 inch (12.70 mm) diameter seven wire strand	0.521 plf (0.775 kg/m)
0.60 inch (15.24 mm) diameter seven wire strand	0.740 plf (1.102 kg/m)
1.00 inch (26 mm) high strength deformed bar	3.010 plf (4.480 kg/m)
1.25 inch (32 mm) high strength deformed bar	4.395 plf (6.540 kg/m)
1.42 inch (36 mm) high strength deformed bar	5.564 plf (8.280 kg/m)

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0085.4310	Post-Tensioning Integral Pier Cap	LB

Payment shall be full compensation for furnishing, installing, stressing, grouting all post-tensioning tendons, and probing and inspecting grouted anchorages. Payment shall also include anchorage assemblies and post-tensioning system hardware which is not embedded in concrete, external ducts, grout and grouting, all testing, anchorage protection systems. This payment shall also include lubricants in the tendon ducts for friction control and flushing the lubricant from the tendon ducts after stressing. No separate measurement and payment will be made for anchorage components, local anchorage zone reinforcement supplied as an integral part of a proprietary anchorage system, nor ducts for similar post-tensioning system hardware. Anchorage components, ducts, and similar items of post-tensioning system hardware, which are embedded within precast components or cast-in-place concrete, shall be deemed to be included in the cost of the precast components or cast-in-place concrete.

In the event that the contractor constructs the structure with an accepted alternate not detailed on the Plans, the payment shall be based on the unit price bid extended by either the quantities shown on the Plans or the actual quantities used and accepted, whichever is less.

298. Removing Pavement Markings Water Blasting, Item SPV.0090.0010.

A Description

This special provision describes removing pavement markings using high pressurized water spray from locations shown on the plans or as the engineer directs. Conform to standard spec 646 as modified in this special provision.

B (Vacant)

C Construction

Remove pavement marking using a high pressurized water spray with a vacuum recovery system to provide a clean, dry surface, without the use of a secondary cleanup process when pavement or ambient air temperature is 36 degrees F and rising. Remove all markings in their entirety. Provide equipment with a storage system that contains wastewater and debris. Control blast head at all times.

Obtain approval from engineer to perform alternative removal process, including grinding, when either restricted from using water blasting or water blasting alone was unsuccessful.

D Measurement

The department will measure Removing Pavement Markings Water Blasting by the linear foot of 4-inch wide line acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0010	Removing Pavement Markings Water Blasting	LF

Payment is full compensation for removing pavement markings.
SEF Rev. 14_0319

299. Removing Concrete Barrier Temporary Precast, Item SPV.0090.0011.

A Description
This special provision describes Removing Concrete Barrier Temporary Precast in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided. The temporary barrier has been left in place under a previous contract.

The concrete barrier temporary precast including any attached temporary glare screen and reflectors becomes the property of the contractor at the completion of the contract.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Removing Concrete Barrier Temporary Precast in linear feet, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item.

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0011	Removing Concrete Barrier Temporary Precast	LF

Payment is full compensation for removing concrete barrier temporary precast including any attached temporary glare screen and reflectors.

300. Removing Temporary Shoring Left In Place, Item SPV.0090.0012.

A Description
This special provision describes Removing Temporary Shoring Left In Place in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided. The temporary shoring has been left in place under a previous contract.

B (Vacant)

C Construction
Remove portion and or all part of temporary shoring five feet below finished surface elevation or as directed by the engineer. Dispose of all removed material at an offsite location.

Backfill the space that is excavated but not occupied by the new permanent construction in accordance to standard spec 206.3.13.

D Measurement
The department will measure Removing Temporary Shoring Left In Place by the linear, foot acceptably completed, measured horizontally along the length of the shoring.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item.

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0012	Removing Temporary Shoring Left In Place	LF

Payment is full compensation for removing shoring, excavation, backfilling, furnishing and hauling materials; and for disposing of all materials.

301. Removing Steel Pipe, Item SPV.0090.0014; Removing Water Pipe, Item SPV.0090.0015; Removing Concrete Encased Duct Bank, Item SPV.0090.0016.

A Description
This special provision describes completely or partially removing existing utilities and disposing of all resulting materials in accordance to the plans, standard specifications, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), and as hereinafter provided and these special provisions.

The bid item Removing Sanitary Sewer Pipe will only pay for the sanitary sewer removals shown on the sanitary sewer plans. Removing existing concrete utility pipes with or without reinforcement of varying sizes will be paid for under the Removing Storm Sewer (Size) bid items.

A.1 Removing Steel Pipe
This item includes removing existing steel, ductile iron and cast iron utility and casing pipes 18 inches and greater in diameter as shown on the plans. Removal of carrier pipes inside casing pipes is incidental to the item Removing Steel Pipe. Removal of existing steel, ductile iron and cast iron utility pipes less than 18 inches in diameter are not included in the item Removing Steel Pipe and are considered incidental to the Excavation Common bid item unless included in the Removing Water Pipe item. Steel pipes with asbestos-containing coasting will be removed by the original utility owner and are not included in the item Removing Steel Pipe. Removal of existing utility pipes consisting of materials other than concrete, steel, ductile iron or cast iron of any size are incidental to the Excavation Common bid item.

A.2 Removing Water Pipe
This item includes only removing existing water pipes due to conflicts with Structures R-40-546 and R-40-548. These existing water pipes vary in diameter between 8 inches and

16 inches as shown on the plans. The item Removing Water Pipe will pay for removals as shown on the plans.

A.3 Removing Concrete Encased Duct Bank
This item includes removing existing utility concrete encased duct banks varying in size from 2 feet by 2 feet to 3 feet by 3 feet as shown on the plans. Removal of existing utility duct packages not encased in concrete are not included in the item Removing Concrete Encased Duct Bank and are considered incidental to the Excavation Common bid item.

B Materials
Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material as directed by the engineer.

C Construction
Perform work in accordance to standard spec 204 and as hereinafter provided. The contractor is responsible for the safe methods and sequence of controlled removal operations. As directed by the engineer, completely remove the existing utility to the extent required to avoid interfering with new construction work.

Thoroughly clean the ends of the existing pipe or concrete encased duct bank and bulkhead the existing utility connections to remain with brick or concrete block masonry, or with any grade of concrete specified under standard spec 501.3.1.3, or any engineer-approved commercial grade of concrete, or plug by other engineer-approved method.

Backfill all excavations or voids not occupied by other work under this contract in accordance to standard spec 204.3.1.2.

D Measurement
The department will measure Removing Steel Pipe, Removing Water Pipe, and Removing Concrete Encased Duct Bank bid items by the linear foot acceptably completed, measured horizontally to the nearest foot from face to face of bulkheads or plugs along the centerline of the pipe or concrete encased duct bank.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0014	Removing Steel Pipe	LF
SPV.0090.0015	Removing Water Pipe	LF
SPV.0090.0016	Removing Concrete Encased Duct Bank	LF

Payment is full compensation for furnishing all excavating; for cutting and removing existing utilities; for furnishing any required brick, concrete block, or concrete; for furnishing all plugging and bulkheading; for furnishing all backfilling; for furnishing, placing, and compacting Backfill Granular; and for hauling and disposing of all materials.

302. Concrete Barrier Type S42C With 48-Inch Pan, Item SPV.0090.0100; Concrete Barrier Type S56 Special, Item SPV.0090.0101; Concrete Barrier Type S56A Special, Item SPV.0090.0102; Concrete Barrier Type S42 With 24-Inch Pan, Item SPV.0090.0103; Concrete Barrier Vertical Back Type S42 Modified With 24-Inch Pan, Item SPV.0090.0104; Concrete Barrier Type S56 With 24-Inch Pan, Item SPV.0090.0105.

A Description
Construct Concrete Barrier (Type) (Size) in accordance to standard spec 603, details shown in the plans and as hereinafter provided.

B Materials
Furnish materials conforming to standard spec 603.2.

Concrete minimum strength to be 4000 psi.

C Construction
Use construction methods conforming to standard spec 603.3.

Barrier shall consist of cast-in-place construction. Pre-cast barrier will not be accepted.

Delete paragraph (1) in standard spec 603.3.2.1 and replace with the following:

Install anchor bars at the locations, spacing, and depth shown in the plans.

Construct the Concrete Barrier (Type) (Size) to present a smooth, uniform appearance in its final position conforming to the horizontal and vertical lines shown on the plans or ordered by the engineer, and be free of lumps, sags or other irregularities. The top and exposed faces of the barrier shall conform to standard spec 603.3.2.4.2.

If constructed by using a slip form machine or similar type equipment, the Concrete Barrier (Type) (Size) shall be of well-compacted, dense concrete, and the exposed surfaces conform to standard spec 603.3.2.4.4. If requested by the engineer, evidence of successful operation of the slip form machine or other equipment may be required.

Feed concrete into the slip form machine at a uniform rate. Operate the machine under sufficient uniform restraint to forward motion to produce a well compacted mass of concrete free from surface pits larger than one inch in diameter and requiring no further finishing, other than that conforming to standard spec 603.3.2.4.3.

Utilize concrete of such consistency that, after slip forming, it will maintain the shape of the barrier without support.

Construct expansion joints in conformance with standard spec 603.3.2.2.

When forming joints before the concrete has hardened, support adjacent portions of the barrier firmly with close fitting shields.

When forming joints after the application of curing compound, treat the exposed faces of the barrier in the vicinity of the joint with curing compound after the forming of the joints.

In transitions between barrier shapes, tie reinforcement bars to Concrete Barrier (Type) (Size) reinforcement by tying the first vertical bar +/- 3 inches from the transition point and lapping any horizontal bars that match.

D Measurement
The department will not measure Concrete Barrier (Type) (Size). The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0100	Concrete Barrier Type S42C With 48-Inch Pan	LF
SPV.0090.0101	Concrete Barrier Type S56 Special	LF
SPV.0090.0102	Concrete Barrier Type S56A Special	LF
SPV.0090.0103	Concrete Barrier Type S42 With 24-Inch Pan	LF
SPV.0090.0104	Concrete Barrier Vertical Back Type S42 Modified With 24-Inch Pan	LF
SPV.0090.0105	Concrete Barrier Type S56 With 24-Inch Pan	LF

Payment will be made in accordance to standard spec 603.5.2.

Delete paragraph (1) in standard spec 603.5.2 and replace with the following:

Except as specified otherwise below for cast in place barrier deficient in smoothness by more than 3/8 inch, payment for Concrete Barrier (Type) (Size) is full compensation for excavating and preparing the foundation; for providing all materials shown in the plans, including concrete, expansion joints, reinforcement, concrete and base aggregate dense between parallel runs of concrete barrier vertical back, and extruded polystyrene; for furnishing all joints as shown in the plans; and for placing, finishing, protecting, and curing concrete.

Delete standard spec 603.5.3.

303. Maintain Concrete Barrier Temporary Precast, Item SPV.0090.0125.

A Description
This special provision describes maintaining existing concrete barrier temporary precast including any attached temporary glare screen and reflectors. The temporary barrier has been left in place under a previous contract. Assume ownership and responsibility of the

temporary barrier, temporary glare screen and reflectors upon the contract's Notice to Proceed. The location of this temporary barrier is shown in the Traffic Control plans.

Concrete barrier temporary precast including any attached temporary glare screen and reflectors that are to remain in place at the end of this contract as shown in the Traffic Control plans becomes property of the department after final acceptance by the engineer.

B Materials
The concrete barrier temporary precast left in place from a previous project is Wisconsin type concrete barrier temporary precast.

C Construction
Maintain Wisconsin type concrete barrier temporary precast left in place in accordance to standard spec 603.

Realign the wall after snow plow operations or as directed by the engineer. Maintain reflectors and hardware in a condition similar to when new on the project.

D Measurement
The department will measure Maintain Concrete Barrier Temporary Precast by the linear foot of concrete barrier temporary precast, acceptably maintained.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0125	Maintain Concrete Barrier Temporary Precast	LF

Payment is full compensation for receiving, maintaining, and leaving on the project site concrete barrier temporary precast including any attached temporary glare screen and reflectors.

304. Pipe Underdrain 6-Inch Special, Item SPV.0090.0126.

A Description
This work shall consist of providing necessary subsurface drainage by constructing trenches, placing the required geotextile fabric, installing the designated pipes or drainage devices within, cored connections, back-plastering and or mortaring connections to storm sewer structures, and backfilling the trenches with the specified backfill material in accordance to standard specs 310, 612 and 645, as shown on the plans, and as hereinafter provided.

B Materials

B.1 Base Aggregate

All aggregate shall be base aggregate open graded and shall conform to standard spec 310.2.

B.2 Pipe Underdrain

Conform to standard spec 612.2.

B.3 Geotextile Fabric

Geotextile fabric shall consist of Type DF Schedule A and shall conform to standard spec 645.2.4.

C Construction

Conform to standard spec 612.3.

D Measurement

The department will measure Pipe Underdrain 6-Inch Special by the linear foot, acceptably completed. The department will measure along the centerline of the pipe, center to center of junctions and fittings.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0126	Pipe Underdrain 6-inch Special	LF

Payment is full compensation for providing, handling, and placing all materials, including pipe, base aggregate open graded, geotextile fabric Type DF Schedule A, cored connections, back-plastering and or mortaring connection to storm sewer structure, fittings, and caps or plugs; for furnishing all excavating, plowing, and re-compacting, salvaging; disposing of surplus material; and for restoring the work site. No additional payment will be made for base aggregate open graded.

305. Concrete Gutter Special, Item SPV.0090.0150.

A Description

Perform this work in accordance to the pertinent requirements of standard spec 601 and conform to the construction detail shown in the plans.

B Materials

Use materials as described in the construction detail shown in the plans and as described in standard spec 601.2.

C Construction

Perform work including placing expansion joints in accordance to standard spec 601.3. Warp gutter slope to match at inlet cover locations.

D Measurement
The department will not measure Concrete Gutter Special. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0150	Concrete Gutter Special	LF

Payment is full compensation for preparing the foundation; all special construction required at swales behind retaining walls; for providing all materials, including concrete, expansion joints, expansion material between gutter and coping of the retaining wall; for placing, finishing, protecting, and curing concrete; for forming joints.

306. Concrete Curb and Gutter 37-Inch, Item SPV.0090.0151.

A Description
Perform this work in accordance to the pertinent requirements of standard spec 601 and conform to the construction detail shown in the plans.

B Materials
Use materials as described in the construction detail shown in the plans and as described in standard spec 601.2.

C Construction
Perform work in accordance to standard spec 601.3.

D Measurement
The department will not measure Concrete Curb and Gutter 37-Inch. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0151	Concrete Curb and Gutter 37-Inch	LF

Payment is full compensation for preparing the foundation; all special construction required at driveway entrances or curb ramps; for providing all materials, including concrete, expansion joints, and tie bars in unhardened concrete; for placing, finishing, protecting, and curing concrete; and for sawing joints.
SEF Rev. 12_0330

307. Concrete Curb and Gutter 4-Inch Sloped 60-Inch Type A, Item SPV.0090.0152.

A Description

Perform this work in accordance to the pertinent requirements of standard spec 601 and conform to the construction detail shown in the plans.

B Materials

Use materials as described in the construction detail shown in the plans and as described in standard spec 601.2.

C Construction

Perform work in accordance to standard spec 601.3.

D Measurement

The department will not measure Concrete Curb and Gutter 4-Inch Sloped 60-Inch Type A. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0152	Concrete Curb and Gutter 4-Inch Sloped 60-Inch Type A	LF

Payment is full compensation for preparing the foundation; all special construction required at driveway entrances or curb ramps; for providing all materials, including concrete, expansion joints, and tie bars in unhardened concrete; for placing, finishing, protecting, and curing concrete; and for sawing joints.

SEF Rev. 12_0330

308. Pavement Marking Grooved Preformed Thermoplastic Stop Line 18-Inch, Item SPV.0090.0300; Stop Line 24-Inch, Item SPV.0090.0301; Crosswalk 6-Inch, Item SPV.0090.0302; Crosswalk 12-Inch, Item SPV.0090.0303; Zebra Marking 24-Inch, SPV.0090.0305.

A Description

This special provision describes grooving the pavement surface, and furnishing and installing preformed thermoplastic pavement marking as shown on the plans, in accordance to standard spec 647, and as hereinafter provided.

B Materials

Furnish preformed thermoplastic pavement marking and sealant material, if required, from the department's approved products list.

C Construction

C.1 General

For quality assurance, provide the engineer and the region's Marking Section evidence of manufacturer training in the proper placement and installation of preformed thermoplastic pavement marking.

Plane the grooved lines in accordance to the plan details. Use grooving equipment with a free-floating, independent cutting or grinding head. Plane a minimum number of passes to create a smooth groove.

C.2 Groove Depth

Cut the groove to a depth of 120 mils ±10 mils deeper than the thermoplastic thickness, from the pavement surface or, if tined, from the high point of the tined surface. Measure depth using a straightedge placed perpendicular to the groove. The department may periodically check groove depths.

C.3 Groove Width – Linear Markings

Cut the groove 1-inch wider than the width of the thermoplastic.

C.4 Groove Position

Position the groove edge in accordance to the plan details.

C.4.1 Linear Marking

Groove at a minimum of 4-inches, but not greater than, 12-inches from both ends of the line segment. Achieve straight alignment with the grooving equipment.

C.4.2 Special Marking

Groove a box around the special marking up to 4 inches from the perimeter of the special marking.

C.5 Groove Cleaning

C.5.1 Concrete

Cooling the cutting head with water may be necessary for some applications and equipment. If cooling water is necessary, flush the groove immediately with water after cutting to remove any build-up of cement dust and water slurry. If this is not done, the slurry may harden in the groove.

If water is used in the grooving process, allow the groove to dry a minimum of 24 hours after groove cleaning, after removal of excess water, and prior to pavement marking application. Clean and dry the groove for proper application of the sealant, and placement of the pavement marking. Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove; use of the air blower does not decrease the amount of time required for the groove to dry.

C.5.2 New Asphalt
Groove pavement 10 or more days after paving. Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove.

C.5.3 Existing Asphalt
Check for structural integrity in supporting grooving operations. If the structural integrity of the asphalt pavement is inadequate to support grooving operations, immediately notify the engineer.

C.5.4 Asphalt
Use a high-pressure air blower with at least 185 ft^3/min air flow and 90 psi air pressure to clean the groove.

C.6 Preformed Thermoplastic Application
Preheat the surface if necessary based on manufacturer's recommendation.

Application of the preformed thermoplastic in the groove without sealant will be as follows:

- May 1 to September 30, both dates inclusive – the Southeast Region and the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.
- June 1 to August 31 – the Southwest Region, and the Northeast, North Central, and Northwest Regions except for the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.

Application of the preformed thermoplastic in the groove with sealant materials will be as follows:

- October 1 to April 30, both dates inclusive – the Southeast Region and the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.
- September 1 to May 31, both dates inclusive – the Southwest Region and the Northeast, North Central, and Northwest Regions, except for the ozone non-attainment or maintenance Northeast Region counties of Sheboygan, Manitowoc, Kewaunee, and Door.

The sealant must be wet.

D Measurement
The department will not measure Pavement Marking Grooved Preformed Thermoplastic (Type) (Size). The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0300	Pavement Marking Grooved Preformed Thermoplastic Stop Line 18-Inch	LF
SPV.0090.0301	Pavement Marking Grooved Preformed Thermoplastic Stop Line 24-Inch	LF
SPV.0090.0302	Pavement Marking Grooved Preformed Thermoplastic Crosswalk 6-Inch	LF
SPV.0090.0303	Pavement Marking Grooved Preformed Thermoplastic Crosswalk 12-Inch	LF
SPV.0090.0305	Pavement Marking Grooved Preformed Thermoplastic Zebra Marking 24-Inch	LF

Payment is full compensation for cleaning and preparing the pavement surface, furnishing and installing the material.

309. Pavement Marking Contrast Epoxy 7-Inch, Item SPV.0090.0310.

A Description
This special provision describes furnishing and installing contrast epoxy pavement marking in accordance to standard spec 646.

B Materials
Furnish epoxy pavement marking materials that is in accordance to the pertinent requirements of standard spec 646.

C Construction
Pavement Marking Contrast Epoxy 7-inch shall consist of a 4-inch wide white epoxy line between two 1 ½-inch black epoxy lines for a total width of 7 inches. Construct epoxy pavement marking in accordance to the pertinent requirements of standard spec 646.3.

D Measurement
The department will not measure Pavement Marking Contrast Epoxy 7-Inch. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0310	Pavement Marking Contrast Epoxy 7-Inch	LF

Payment will be as specified in standard specs 646.5 (2), (4) and (5).
SEF Rev. 12_1008

310. Pavement Marking Contrast Epoxy 11-Inch, Item SPV.0090.0311.

A Description
This special provision describes furnishing and installing contrast epoxy pavement marking in accordance to standard spec 646.

B Materials
Furnish epoxy pavement marking materials that is in accordance to the pertinent requirements of standard spec 646.

C Construction
Pavement Marking Contrast Epoxy 11-inch shall consist of an 8-inch wide white epoxy line between two 1 ½-inch black epoxy lines for a total width of 11 inches. Construct epoxy pavement marking in accordance to the pertinent requirements of standard spec 646.3.

D Measurement
The department will not measure Pavement Marking Contrast Epoxy 11-Inch. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0311	Pavement Marking Contrast Epoxy 11-Inch	LF

Payment will be as specified in standard specs 646.5 (2), (4) and (5).
SEF Rev. 12_1008

311. Glare Screens Temporary, Item SPV.0090.0400.

A Description
The work under this item shall include furnishing, installing, maintaining, and removing a modular paddle glare guard system on concrete barrier temporary precast at the indicated locations in accordance to the plans and standard specifications, as directed by the engineer and as hereinafter provided.

B Materials
Glare guard units shall be modular units consisting of vertical blades, bases, and a horizontal base rail. The paddle devices shall be a minimum of 24-inches in height and be constructed of durable, impact resistant, non-warping flexible materials.

Units shall be modular in design to provide for portability, quick repair and easy installation. The cumulative nominal length of the modular units shall equal the length of the temporary barrier on which they are installed so that the joint between the barrier

sections shall not be spanned by any one unit. Units shall not alter the design of the concrete barrier.

The relative connection strengths between various components of the assembly shall be designed to minimize the potential impact and debris hazard to approaching traffic and to simplify repairs. The modular units shall be fabricated in a manner to allow replacement of individual blades while the modular unit remains in place.

The blade, base and rail shall be made of high impact materials with sufficient strength to withstand three impacts from a horizontal steel bar traveling at 40 mph and impacting at mid-height of the blade. After three impacts, there shall be no evidence of cracking, splitting, delaminating or separation from the system.

The paddle glare guard provided shall be a material manufactured by Safe-Hit Corporation, 2405 IH 35 West, New Braunfels, Texas, 78130; Carsonite International, 2900 Lockhead Way, Carson City, Nevada, 89701; Flexstake Incorporated, 2150 Andrea Lane, Fort Myers, Florida, 33912; or equal.

C Construction

Attachment of the base rail to the top of the concrete barrier temporary precast shall be by means of a mechanical or adhesive system with a minimum pullout and shear of 3000 psi. All mounting hardware shall be as specified by the manufacturer.

D Measurement

The department will measure Glare Screens Temporary by the linear foot of paddle glare guard, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0400	Glare Screens Temporary	LF

Payment is full compensation for furnishing, installing, maintaining and removing the Glare Screens Temporary.

312. Traffic Channelizing Curb System, Item SPV.0090.0401.

A Description

This special provision describes furnishing, installing, maintaining, and removing or leaving in place temporary traffic channelizing curb system at locations shown on the plan or as directed by the engineer.

Traffic Channelizing Curb System which is to be left in place become property of the department after final acceptance by the engineer.

B Materials

B.1 General

Furnish a temporary traffic channelizing curb system with a base component consisting of interlocking units and flexible vertical component. The system shall be constructed of material resistant to ultraviolet light, ozone and hydrocarbons. The units should interface with each other to form a temporary continuous longitudinal lane channelizing system separating traffic lanes. Provide a system that is fastened to or placed on the underlying pavement surface according to the manufacturer's recommendations. The system shall be continuous interlocking modules and allow for cross drainage under or around the curb modules.

The channelizing system shall meet the requirement of National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH). Submit a copy of the FHWA approval letter to the engineer.

B.2 Curb Unit

The curb sections shall be approximately 12" wide and shall not exceed 4" in height. Curb sides shall be sloped to allow crossover by emergency vehicles. Normal curb sections shall be a minimum of 40 inches and a maximum of 48 inches long. The transition sections shall be 18 inches long and shall not exceed 2 inches in height at the exposed nose. The units shall be yellow if used in a work zone installation or a permanent installation adjacent to yellow pavement markings, and white if used in a permanent installation adjacent to white pavement markings.

B.3 Vertical Component

Provide at least one vertical component for every other modular curb unit or 6 feet to 7 feet uniformly spaced along the channelizing system. The vertical component shall be orange in color if used in a work zone installation. The component shall be yellow if used in a permanent installation adjacent to yellow pavement markings, and white if used in a permanent location adjacent to white pavement markings.

The vertical component shall be a minimum of 36 inches and a maximum of 48 inches in height measured from the pavement surface. The width should be approximately 8 to 9 inches for elliptical designs and 4 to 6 inches for round (tubular) designs.

The vertical component shall be equipped with reflective sheeting or with reflective stripes conforming to standard specification 637.2.2.2. Where stripes are used, the stripes shall consist of two 3-inch wide bands placed a maximum of 2 inches from the top with a maximum of 4 inches between the bands. The base component shall be equipped with reflectors.

C Construction

C.1 Installation

Install the channelizing system according to the manufacturer's recommendations. Remove all conflicting pavement marking, raised pavement marker and delineator posts in the location where the channelizing system is to be installed. Follow manufacturer's

installation procedures regarding anchoring systems into the various types of roadway surfaces. Only use anchors and hardware provided by the manufacturer.

C.2 Maintenance
Review the channelizing system in accordance to standard spec 643.3.1(6) or 643.3.2 or the engineer directs. Replace damaged retroreflective sheeting, misaligned curb units, damaged vertical components, and anchor bolts within 24 hours after the damage is reported to the contractor.

C.3 Relocate
Relocate the channelizing system at locations the plans show or the engineer directs.

C.4 Removal
Repair all holes left in the pavement when the temporary traffic channelizing curb system is removed. Holes shall be filled with an engineer-approved non-shrink grout.

Upon completion of the work, remove or leave in place the channelizing system as shown on the plans.

D Measurement
The department will measure Traffic Channelizing Curb System by the linear foot, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0401	Traffic Channelizing Curb System	LF

Payment is full compensation for furnishing, installing, maintaining, relocating, and removing or leaving in place the channelizing system.

313. Glare Screens Temporary Left In Place, Item SPV.0090.0501.

A Description
The work under this item shall include furnishing, installing, and maintaining a modular paddle glare guard system on concrete barrier temporary precast at the indicated locations in accordance to the plans and standard specifications, as directed by the engineer and as hereinafter provided.

Glare Screens Temporary Left In Place become property of the department after final acceptance by the engineer.

B Materials
Glare guard units shall be modular units consisting of vertical blades, bases, and a horizontal base rail. The paddle devices shall be a minimum of 24-inches in height and be constructed of durable, impact resistant, non-warping flexible materials.

Units shall be modular in design to provide for portability, quick repair and easy installation. The cumulative nominal length of the modular units shall equal the length of the temporary barrier on which they are installed so that the joint between the barrier sections shall not be spanned by any one unit. Units shall not alter the design of the concrete barrier.

The relative connection strengths between various components of the assembly shall be designed to minimize the potential impact and debris hazard to approaching traffic and to simplify repairs. The modular units shall be fabricated in a manner to allow replacement of individual blades while the modular unit remains in place.

The blade, base and rail shall be made of high impact materials with sufficient strength to withstand three impacts from a horizontal steel bar traveling at 40 mph and impacting at mid-height of the blade. After three impacts, there shall be no evidence of cracking, splitting, delaminating or separation from the system.

The paddle glare guard provided shall be a material manufactured by Safe-Hit Corporation, 2405 IH 35 West, New Braunfels, Texas, 78130; Carsonite International, 2900 Lockhead Way, Carson City, Nevada, 89701; Flexstake Incorporated, 2150 Andrea Lane, Fort Myers, Florida, 33912; or equal.

C Construction

Attachment of the base rail to the top of the concrete barrier temporary precast shall be by means of a mechanical or adhesive system with a minimum pullout and shear of 3000 psi. All mounting hardware shall be as specified by the manufacturer.

D Measurement

The department will measure Glare Screens Temporary Left In Place by the linear foot of paddle glare guard, acceptably left in place.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0501	Glare Screens Temporary Left In Place	LF

Payment is full compensation for furnishing, installing, and maintaining the Glare Screens Temporary Left In Place.

314. Concrete Barrier Temporary Precast Delivered Special, Item SPV.0090.0502.

A Description

This special provision describes leaving in place temporary precast reinforced concrete barrier conforming to the shape, dimensions, and details the plans show and in accordance

to the pertinent provisions of standard spec 603, these special provisions, and as hereinafter provided.

Concrete Barrier Temporary Precast Delivered Special becomes property of the department after final acceptance by the engineer.

B (Vacant)

C Construction

C.1 Delivery, On-The-Project Trucking and Removal

Replace standard spec 603.3.2.2 (1) with the following:

Under the Concrete Barrier Temporary Precast Delivered Special bid item, furnish and deliver temporary barrier to worksites within the project and leave it in place upon project completion.

D Measurement

The department will not measure Concrete Barrier Temporary Precast Delivered Special. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0502	Concrete Barrier Temporary Precast Delivered Special	LF

Replace standard spec 603.5.3 (1) with the following:

Payment for Concrete Barrier Temporary Precast Delivered Special is full compensations for providing barrier, initial delivery, trucking between worksites and leaving barrier, steel rail connections and steel cap rail in place after contract completion.

315. Fence Temporary 6-Foot, Item SPV.0090.0600.

A Description

This special provision describes furnishing, erecting and maintaining temporary chain link fence 6-foot including gates, as shown on the plans and as directed by the engineer, in accordance to standard spec 616, and as hereinafter provided. The intent of this specification is to provide a secure enclosure.

B Materials

Fencing parts furnished do not have to be new materials. Used, re-rolled and open seam materials will be permitted. Gates shall be a minimum of 12 feet wide.

No specific metallic coating will be required for the chain link fencing materials. Materials furnished do not have to be of the same type. Fence height shall be a minimum of 6 feet.

The engineer may reject fencing materials which, in the engineer's opinion, are too damaged or misaligned to provide acceptable closure.

C Construction

Fence posts may be driven into the ground or set in augered holes, backfilled and compacted. Minimum embedment shall be 4 feet. In paved areas fence posts shall be fastened to either temporary concrete barrier or the pavement by methods ensuring a secure enclosure. Where fence is installed in areas that are not to be disturbed by subsequent construction activities, the disturbed area shall be restored in kind at no additional cost to the department.

D Measurement

The department will measure Fence Temporary 6-Foot in place by the linear foot from end posts, center to center, along the ground line, acceptably completed. Temporary fence will be measured once for payment. Additional measurement for fence maintenance and removal will not be made.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0600	Fence Temporary 6-Foot	LF

Payment is full compensation for furnishing all materials; erecting posts, gates and fence; maintaining fencing; removing and disposing of fencing; and for restoring disturbed areas.

316. Fence Temporary Left In Place 6-Foot, Item SPV.0090.0602.

A Description

This special provision describes furnishing, erecting and maintaining temporary chain link fence 6-foot including gates, as shown on the plans and as directed by the engineer, in accordance to standard spec 616, and as hereinafter provided. The intent of this specification is to provide a secure enclosure.

Fence Temporary Left In Place 6-Foot becomes property of the department after final acceptance by the engineer.

B Materials

Fencing parts furnished do not have to be new materials. Used, re-rolled and open seam materials will be permitted. Gates shall be a minimum of 12 feet wide.

No specific metallic coating will be required for the chain link fencing materials. Materials furnished do not have to be of the same type. Fence height shall be a minimum of 6 feet.

The engineer may reject fencing materials which, in the engineer's opinion, are too damaged or misaligned to provide acceptable closure.

C Construction

Fence posts may be driven into the ground or set in augered holes, backfilled and compacted. Minimum embedment shall be 4 feet. In paved areas fence posts shall be fastened to either temporary concrete barrier or the pavement by methods ensuring a secure enclosure. Where fence is installed in areas that are not to be disturbed by subsequent construction activities, the disturbed area shall be restored in kind at no additional cost to the department.

D Measurement

The department will measure Fence Temporary Left In Place 6-Foot by the linear foot from end posts, center to center, along the ground line, acceptably left in place. Temporary fence will be measured once for payment. Additional measurement for fence maintenance will not be made.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0602	Fence Temporary Left In Place 6-Foot	LF

Payment is full compensation for furnishing all materials; erecting posts, gates and fence; maintaining fencing; and for restoring disturbed areas.

317. Fence Temporary Left In Place 8-Foot, Item SPV.0090.0603.

A Description

This special provision describes furnishing, erecting and maintaining temporary chain link fence 8-foot including gates, as shown on the plans and as directed by the engineer, in accordance to standard spec 616, and as hereinafter provided. The intent of this specification is to provide a secure enclosure.

Fence Temporary Left In Place 8-Foot becomes property of the department after final acceptance by the engineer.

B Materials

Fencing parts furnished do not have to be new materials. Used, re-rolled and open seam materials will be permitted. Gates shall be a minimum of 12 feet wide.

No specific metallic coating will be required for the chain link fencing materials. Materials furnished do not have to be of the same type. Fence height shall be a minimum of 8 feet.

The engineer may reject fencing materials which, in the engineer’s opinion, are too damaged or misaligned to provide acceptable closure.

C Construction

Fence posts may be driven into the ground or set in augered holes, backfilled and compacted. Minimum embedment shall be 4 feet. In paved areas fence posts shall be fastened to either temporary concrete barrier or the pavement by methods ensuring a secure enclosure. Where fence is installed in areas that are not to be disturbed by subsequent construction activities, the disturbed area shall be restored in kind at no additional cost to the department.

D Measurement

The department will measure Fence Temporary Left In Place 8-Foot by the linear foot from end posts, center to center, along the ground line acceptably left in place. Temporary fence will be measured once for payment. Additional measurement for fence maintenance will not be made.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0603	Fence Temporary Left In Place 8-Foot	LF

Payment is full compensation for furnishing all materials; erecting posts, gates and fence; maintaining fencing; and for restoring disturbed areas.

318. Fence Chain Link Screening 6-Foot, Item SPV.0090.0604.

A Description

This special provision describes furnishing, erecting, maintaining, and removing temporary chain link fence 6-foot including screening fabric and gates, as shown on the plans and as directed by the engineer, in accordance to standard spec 616, and as hereinafter provided.

At the construction staging area located east of IH 894 between W. Lincoln Avenue and W. National Avenue, the temporary chain link fence and screening fabric will remain in place in good condition and become property of the department after final acceptance by the engineer.

B Materials

B.1 Fencing

Fencing parts furnished do not have to be new materials. Used, re-rolled and open seam materials will be permitted. Provide gates with a minimum width of 12 feet.

No specific metallic coating will be required for the chain link fencing materials. Furnish fence with a height of 6 feet. The engineer may reject fencing materials which, in the engineer's opinion, are too damaged or misaligned to provide acceptable closure.

B.2 Screening Fabric

Furnish green colored polyethylene knitted, closed-mesh style fabric and all necessary hardware and materials to install the screening fabric. Provide screening fabric consisting of UV resistant synthetic polyethylene fibers systematically knitted into a stable network with a height of 5' 8" for a 6-foot tall fence and meeting the following minimum requirements:

- Weight: 4.9 oz/yd^2
- Burst Strength: 210 psi
- Warp Tensile Strength: 145 lbs
- Fill Tensile Strength: 120 lbs

Provide screening fabric binding consisting of 3-ply material double stitched on all edges with #2 brass grommets spaced 24 inches on center. Mid-row grommets installed on the face of the fabric will not be accepted.

Furnish UV resistant 8" x 0.130" polypropylene cable ties with a minimum tensile strength of 50 lbs or corrosion resistant steel hog rings, 9-gauge with a minimum of 0.80 oz/ft^2 zinc coating.

At least fifteen working days prior to the start of installation, supply one 2-foot x 2-foot sample of the screening fabric and the manufacturer's published product data and installation instructions. The screening fabric is to be approved by the engineer prior to placement in the field.

C Construction

C.1 Fencing

Fence posts may be driven into the ground or set in augered holes, backfilled and compacted. Install with a minimum embedment of 4 feet. In paved areas, fasten fence posts to either temporary concrete barrier or the pavement by methods ensuring a secure enclosure. Where fence is installed in areas that are not to be disturbed by subsequent construction activities, restore the disturbed areas in kind at no additional cost to the department.

C.2 Screening Fabric

Install the screening fabric in accordance to the manufacturer's recommendations or as directed by the engineer.

C.3 General

Maintain the fence and screening fabric during construction. Repair or replace any portion of the fence or screening fabric that is damaged as directed by the engineer. Remove dirt and debris from the screening fabric and properly dispose of all debris.

Remove fence and screening fabric or leave in place at the completion of this contract as directed by the engineer.

D Measurement

The department will measure Fence Chain Link Screening 6-Foot by the linear foot from end posts, center to center, along the ground line acceptably completed and removed or left in place. Temporary fence and screening fabric will be measured once for payment. Additional measurement for fence and screening fabric maintenance will not be made.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0604	Fence Chain Link Screening 6-Foot	LF

Payment is full compensation for furnishing all materials and hardware; for augering, backfilling, compacting, and fastening; for installing posts, gates, fence, and screening fabric; for maintaining fencing and screening fabric; for removing or leaving in place fencing and screening fabric as directed by the engineer; for cleaning screening fabric and disposing off all debris; and for restoring disturbed areast.

319. Minor Retaining Wall R-1, Item SPV.0090.0900; Minor Retaining Wall R-2, Item SPV.0090.0901.

A Description

Work under this item consists of furnishing and constructing cast-in-place concrete retaining walls at the locations shown on the plans. Perform the work in accordance to pertinent parts of the standard specifications, the plans, and these special provisions.

B Materials

B.1 Concrete

Use materials that conform to concrete masonry as specified in standard spec 501.

B.2 Steel Reinforcement

Use materials that conform to standard spec 505.

B.3 Structure Backfill

Use materials that conform to standard spec 506.

C Construction

C.1 Concrete

Conform to construction requirements in standard spec 501.

C.2 Steel Reinforcement

Conform to construction requirements in standard spec 505.

C.3 Structure Backfill

Conform to construction requirements in standard spec 506.

D Measurement
The department will measure Minor Retaining Wall (Wall number) by the linear foot, acceptably installed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0090.0900	Minor Retaining Wall R-1	LF
SPV. 0090.0901	Minor Retaining Wall R-2	LF

Payment for Minor Retaining Wall (Wall number) is full compensation for furnishing, placing, finishing, curing and protecting concrete masonry; for furnishing, fabricating and placing the bar steel reinforcement; for furnishing, placing, and compacting structure backfill.

320. Cable Aerial Aluminum 6 AWG Quadruplex, Item SPV.0090.1005; Cable Aerial Aluminum 4 AWG Quadruplex, Item SPV.0090.1006; Cable Aerial Aluminum 2 AWG Quadruplex, Item SPV.0090.1007.

A Description
Furnish, install, and connect temporary overhead cable complete with all splicing, identifications, terminations and guy wires at wood poles. The removal of the overhead cable after the temporary lighting is approved for removal.

B Materials
Overhead cable shall be aluminum conductors according to ASTM B 230 and shall be Class B stranded according to ASTM B 231, and shall conform to the values listed in the table below:

Phase Conductor				**Messenger Wire**	
Size AWG	**Stranding**	**Avg. Insulation Thickness**		**Min. Size AWG**	**Stranding**
		mm	mils		
6	7	1.1	45	6	6/1
4	7	1.1	45	4	6/1
2	7	1.1	45	2	6/1

The aerial cable shall be an assembly of insulated aluminum conductors and a steel messenger wire according to ANSI/ICEA S-76-474. The cable assembly may have the messenger wire intertwined with the insulated cables or lashed to the insulated cables by a factory wrap. The cable shall be assembled according to ANSI/ICEA S-76-474.

All cable shall be rated 600-V. The cable shall be rated 105º C dry and 90º C wet and shall be suitable for installation in wet and dry locations, and shall be resistant to oils and chemicals, and UV rated. The UL listing mark, cable voltage, insulation type and ratings,

as well as the cable size, shall all be clearly printed on the cable in a color contrasting with the insulation color. When specified, each cable installed shall be identified with its complete circuit number at each termination, splice, junction box or other location where the wire is accessible.

All electric cables installed shall be color coded. Neutral wires shall be color-coded white. Single phase three wire runs of cable shall be color-coded one black, one red, and one white. Insulated ground wires, where applicable, shall be green. Color striping of cables will not be acceptable in lieu of the specified color coding means.

Make the luminaire connections to the aerial cable with listed parallel tap insulation piercing connectors. The connector shall be rated for 600-V, and be listed under UL Standard 486B.

C Construction

Overhead cable as shown on temporary lighting plans will not be needed for final lighting. Remove temporary overhead cable. Removal of temporary overhead cable will be incidental to this pay item and it will become property of the contractor. The bid price shall reflect the salvage value of the temporary overhead cable.

Upon written request by the contractor, the engineer may permit to reuse removed temporary overhead cable of ampacity equivalent to the specified cable and of a type and condition approved by the engineer, if possible.

Install guy wires as necessary per WisDOT standard details for Spanwire Temporary Traffic Signal.

Conform to standard spec 655.3.5(9) for ground resistance testing.

D Measurement

The department will measure Cable Aerial Aluminum 6 AWG Quadruplex; Cable Aerial Aluminum 4 AWG Quadruplex; Cable Aerial Aluminum 2 AWG Quadruplex; in length by the linear foot in place, acceptably completed, and will be taken as the length of the messenger wire. Measurement will be made in a straight line between changes in direction and to the centers of light standards and control cabinets. Sag of the aerial cable or vertical cable will not be measured for payment. The rewiring to facilitate relocation of the cable due to staging or other construction requirements will not be measured for payment.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.1005	Cable Aerial Aluminum 6 AWG Quadruplex	LF
SPV.0090.1006	Cable Aerial Aluminum 4 AWG Quadruplex	LF
SPV.0090.1007	Cable Aerial Aluminum 2 AWG Quadruplex	LF

Payment is full compensation for providing electrical wire; for making all connections; for providing all connectors, including wire nuts, fuses, fuse holders, splices, tape, and insulators; for providing messenger wire, and guy wires; and for removing temporary overhead cable.

321. Cable Aerial Aluminum 6 AWG Triplex, Item SPV.0090.1009; Cable Aerial Aluminum 4 AWG Triplex, Item SPV.0090.1010; Cable Aerial Aluminum 2 AWG Triplex, Item SPV.0090.1011.

A Description

Furnish, install, and connect temporary overhead cable complete with all splicing, identifications, terminations and guy wires at wood poles. The removal of the overhead cable after the temporary lighting is approved for removal.

B Materials

Overhead cable shall be aluminum conductors according to ASTM B 230 and shall be Class B stranded according to ASTM B 231, and shall conform to the values listed in the table below:

Phase Conductor				Messenger Wire	
Size AWG	Stranding	Avg. Insulation Thickness		Min. Size AWG	Stranding
		mm	mils		
6	7	1.1	45	6	6/1
4	7	1.1	45	4	6/1
2	7	1.1	45	2	6/1

The aerial cable shall be an assembly of insulated aluminum conductors and a steel messenger wire according to ANSI/ICEA S-76-474. The cable assembly may have the messenger wire intertwined with the insulated cables or lashed to the insulated cables by a factory wrap. The cable shall be assembled according to ANSI/ICEA S-76-474.

All cable shall be rated 600-V. The cable shall be rated 105º C dry and 90º C wet and shall be suitable for installation in wet and dry locations, and shall be resistant to oils and chemicals, and UV rated. The UL listing mark, cable voltage, insulation type and ratings, as well as the cable size, shall all be clearly printed on the cable in a color contrasting with the insulation color. When specified, each cable installed shall be identified with its complete circuit number at each termination, splice, junction box or other location where the wire is accessible.

All electric cables installed shall be color coded. Neutral wires shall be color-coded white. Single phase three wire runs of cable shall be color-coded one black, one red, and one white. Insulated ground wires, where applicable, shall be green. Color striping of cables will not be acceptable in lieu of the specified color coding means.

Make the luminaire connections to the aerial cable with listed parallel tap insulation piercing connectors. The connector shall be rated for 600-V, and be listed under UL Standard 486B.

C Construction

Overhead cable as shown on temporary lighting plans will not be needed for final lighting. Remove temporary overhead cable. Removal of temporary overhead cable will be incidental to this pay item and it will become property of the contractor. The bid price shall reflect the salvage value of the temporary overhead cable.

Upon written request by the contractor, the engineer may permit to reuse removed temporary overhead cable of ampacity equivalent to the specified cable and of a type and condition approved by the engineer, if possible.

Install guy wires as necessary per WisDOT standard details for Spanwire Temporary Traffic Signal.

Conform to standard spec 655.3.5(9) for ground resistance testing.

D Measurement

The department will measure Cable Aerial Aluminum 6 AWG Quadruplex; Cable Aerial Aluminum 4 AWG Quadruplex; Cable Aerial Aluminum 2 AWG Quadruplex; in length by the linear foot in place, acceptably completed, and will be taken as the length of the messenger wire. Measurement will be made in a straight line between changes in direction and to the centers of light standards and control cabinets. Sag of the aerial cable or vertical cable will not be measured for payment. The rewiring to facilitate relocation of the cable due to staging or other construction requirements will not be measured for payment.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.1009	Cable Aerial Aluminum 6 AWG Triplex	LF
SPV.0090.1010	Cable Aerial Aluminum 4 AWG Triplex	LF
SPV.0090.1011	Cable Aerial Aluminum 2 AWG Triplex	LF

Payment is full compensation for providing electrical wire; for making all connections; for providing all connectors, including wire nuts, fuses, fuse holders, splices, tape, and insulators; for providing messenger wire, and guy wires; and for removing temporary overhead cable.

322. Cable in Duct 5-6 AWG, Item SPV.0090.1026.

A Description
The work consists of furnishing and installing Cable In Duct 5-6 AWG to match the cable charactetestics and properties of the cable as specified in standard spec 655.3.2.

B (Vacant)

C Construction
Conform to all requirements for the standard bid item 655.0146, with the exception that cable is to have five cables instead of the standard four cables to match the # 6AWG.

D Measurement
The department will measure Cable In Duct 5-6AWG as LF individual unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.1026	Cable in Duct 5-6 AWG	LF

Payment is full compensation for furnishing all work and for labor, tools, equipment and incidentals necessary to complete the work.

323. 4-Duct Conduit Cement Encased 4-Inch Conduit DB-60, Item SPV.0090.2021; 3-Duct Conduit Cement Encased 4-Inch Conduit DB-60, Item SPV.0090.2022; 2-Duct Conduit Cement Encased 4-Inch Conduit DB-60, Item SPV.0090.2023.

A Description
This work consists of furnishing and installing cement encased multiple duct conduit packages below grade in accordance to the applicable sections of the standard specifications, as shown on the plans and as hereinafter described.

B Materials
Conduit. The contractor shall furnish DB-60 polyvinyl chloride (PVC) conduit.

PVC conduit and fittings shall conform to the requirements of Standard Specifications for Smooth-Wall Poly (Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation, ASTM Designation: F512 (latest edition).

Concrete. The type of concrete to be used to encase the ducts will be:

Class of Concrete	Type of Cement	Min. Cement Content Sacks per Cubic Yard	Sizes of Coarse Aggregate
G	Standard Portland Cement Type 1A or 1SA	4.0	Sharp Torpedo Sand only

Slurry Backfill. Aggregate slurry backfill consists of No. 1 concrete aggregate Class 'C' concrete mix with the cement deleted.

Fly Ash (Class C)	75 lbs.
Concrete Sand (Damp)	1830 lbs.
No. 1 Concrete Aggregate	1830 lbs.

The material shall be mixed with water to inundate the aggregate sufficiently to provide an approximate 3 inch slump. The mix shall be deposited in the trench directly from a concrete transit mix truck.

Pull Rope. Pull rope specifications will be:

- Flat construction (7/16" to 5/8" wide)
- 100% woven aramid fiber (may include tracer wire)
- 1500 lbs. Minimum pull strength prelubricated
- sequential footage markings for location

For any questions on materials, contact Ms. Karen Rogney at (414) 286-3243.

C Construction

Excavation. The excavation shall have the minimum or maximum dimensions shown on the plans and as follows:

No. of Ducts Wide	Minimum	Maximum
2	14 1/8"	16 5/8"
3	19 3/4"	22 1/4"
4	25 3/8"	27 7/8"

These minimum and maximum trench widths apply to standard 4 inch PVC electrical duct only. When required, the excavation may be widened for the handling and placing of materials.

Open-cut trenches shall be sheathed and braced as required by code and as necessary to maintain safety. The cost of furnishing, placing and removing of sheathing and bracing shall be included in the unit bid for the work.

The dimensions of the excavation will be governed by the number, configuration and the grade (cover) to which the conduit is to be installed as shown on the plan. The walls of the excavation shall be clean and true.

Previous to excavating trenches, the contractor shall expose the existing manhole and conduit lines. The object of this is to permit adjustments in line and grade to avoid special construction methods. The exposed manhole and conduit shall be protected from damage.

The conduit shall be laid at a depth so that sufficient protection from damage is provided. Allowable covers shall be as follows:

The standard cover for mainline conduit is 39 inches and the minimum cover acceptable shall be 28 inches.

The standard cover shall be maintained wherever possible and any deviation less than the minimum may be allowed only with specific approval of the engineer.

The trench shall be graded so that it will have a minimum pitch of three inches per 100 feet. When an obstruction is encountered in the trench and it is necessary to excavate a deeper trench than would otherwise be required, in order to obtain drainage, refer the matter to the Inspector to determine whether the extra excavation should be made.

In grading a trench for mainline conduit, there are three general practices for direction of pitch.

(a) When grading a trench in a street with a level grade, the high point of the trench bottom should ordinarily be centered between manholes and pitched downward equally toward each manhole.

(b) Where the street slopes in one direction, locate the high point of the trench bottom approximately 30 feet from the end wall of the higher manhole and grade toward both manholes.

(c) Where a steep grade is encountered, grade the trench at the minimum pitch from the end wall of the higher manhole to a point 20 feet plus or minus toward the lower manhole. From this point, follow the street grade at the standard cover to a point 20 feet plus or minimum away from the end wall of the lower manhole. From this point, the remainder of the section shall be laid at the normal pitch.

After the rough excavation is completed, the bottom of the trench shall be prepared to receive the conduit. The duct bed shall be brought to the final grade and graded uniformly from the high point to the low or drainage points. Stone chips or limestone screenings shall be used for grading the trench.

Placing of Duct. Placing of the duct is to proceed as soon as the duct bed has been completed. All ducts shall be inspected before placing to see that the bores are clean and free from mud, sand, etc. Only ducts with a smooth bore, free from burrs, rough projections etc. shall be used. Where burrs or other rough areas likely to damage cable are found in the duct, they shall be smoothed off by rasping or scraping.

The duct shall be placed (as shown on the detail) with the ends staggered so no two couplings are adjacent. This may be accomplished by the use of the short lengths in stock or cutting back full length sections to the desired lengths. If cut pieces are used, the cut end shall be placed at the manhole.

Full length pieces shall be used for the balance of the conduit line.

Formations of two ducts or more in height are to be carried forward in full formation, that is, as each tier of twenty foot lengths is laid on base spacers, the next higher tier of ducts shall then be placed on the intermediate spacers. These spacers shall be two feet from each duct end and one in the middle. The intermediate spacers and ducts shall be placed for the remaining tiers. Each length shall be glued into the adjoining coupling. A twist and push on the duct being placed will suffice for a water tight joint. Caution must be exercised in the driving operation, so that neither the coupling nor duct will be split or damaged in any way. After the full formation has been completed, wood trench and duct bracing shall be placed on the ducts to prevent shifting or floating while the concrete envelope is being placed and during driving operation.

This procedure shall be followed with succeeding lengths, providing spacers (as shown on the detail) at the proper intervals, until sufficient trench footage of completed formation has been placed and is ready to receive concrete encasement.

The terminating point for mainline conduit will be the inside manhole wall, inside abutment wall, or inside wall of bridge house. A standard end bell fitting shall be installed on all duct access points into manholes.

A #10 copper tracer wire shall be installed along and above the centerline of the duct for encasement in the concrete. The wire shall be 2 feet longer than the run of conduit and extend beyond the end of the grout encasement.

Concreting. After sufficient conduit has been laid and the trench and duct have been inspected, concreting is to begin. The minimum concrete encasement of the ducts shall be three inches on the top, two inches on the sides, and three inches on the bottom (as shown on the detail).

After placing, the concrete shall be puddled with a splicing bar or similar tool so that complete duct encasement is accomplished. Wood braces used to keep the conduit from floating shall be removed before the concrete sets completely and the resultant encasement voids filled with concrete.

Concrete encasement shall be allowed sufficient time to set before backfilling is commenced.

Slurry Backfill. The backfilling of the conduit shall commence immediately after the duct has been inspected, approved and has had sufficient time to set to withstand the load.

An aggregate slurry as specified shall be used to backfill all concrete encased conduit. The trench shall be slurry backfilled to the proposed or existing subgrade. The mix shall be deposited in the trench directly from a concrete transit mix truck.

D Measurement
The department will measure Duct Conduit Cement Encased 4-Inch Conduit DB-60, by the linear foot acceptably installed. The linear feet of encased duct will be measured along the centerline of duct between ends of conduit.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.2021	4-Duct Conduit Cement Encased 4-Inch Conduit DB-60	LF
SPV.0090.2022	3-Duct Conduit Cement Encased 4-Inch Conduit DB-60	LF
SPV.0090.2023	2-Duct Conduit Cement Encased 4-Inch Conduit DB-60	LF

Payment is full compensation for furnishing the conduit, conduit bodies, conduit fittings, conduit spacers, end caps, pull ropes and trace wires; for excavating, bedding, encasement and backfilling including any concrete, stone, aggregate slurry, bracing, or other related materials; for disposing of surplus materials; and for making inspections, for installing the conduit.

324. Conduit Subduct, 1-Inch, Item SPV.0090.2024.

A Description
This special provision is to furnish and install 1-Inch conduit to be used as subduct for fiber optic cable installation.

B Material
Furnish 1-Inch PVC Carlon riser-gard with pull tape, Part number Carlon DF4X1C-2700 or approved equal.

C Construction
Install Conduit Subduct 1-Inch where shown on the plans within the communication conduit prior to fiber optic cable installation. Install the conduit as per the manufacturer's instructions.

D Measurement
The department will measure Conduit Subduct 1-Inch by the unit, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.2024	Conduit Subduct 1-Inch	LF

Payment is full compensation for furnishing and installing conduit subduct.

325. Cable Type UF 2-14 AWG, Item SPV.0090.3001.

A Description
This work shall consist of furnishing and installing cable for confirmation lights and making all connections as shown on the plans and as hereinafter provided.

B Materials
Supplement standard spec 655.3.4 with the following:

When lighting is installed in conjunction with traffic signals, conductors from the traffic signal control cabinet to the confirmation light(s) shall be Cable Type UF, 2 conductor without ground, solid copper conductor, size No. 14.

C Construction
Furnish and install Cable Type UF 2-14 AWG for traffic signals.

D Measurement
The department will measure Cable Type UF 2-14 AWG by the linear foot of cable, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.3001	Cable Type UF 2-14 AWG	LF

Payment shall be full compensation for furnishing and installing cable; for making all connections; for furnishing and installing all connectors, including wire nuts, splice kits, tape, insulating varnish or sealant and ground lug fasteners, and for testing.

326. Woven Pull Tape, Item SPV.0090.3002.

A Description
This work shall consist of furnishing and installing woven pull tape in bridge conduits and making all connections as shown on the plans and as hereinafter provided.

B Materials

Furnish woven pull tape with a woven/lock stitch polyester flat tape design. The strength shall be as specified for the application and the tape shall have sequential footage markings spaced no more than 5 feet apart. The markings shall be legible and permanently printed with ink jet. Sufficient excess length shall be inserted so the conduit can be cut at any point during installation without causing excessive tightness in the tape for the remaining conduit f the tape is factory installed.

C Construction

Install the woven pull tape in the bridge conduit. The woven pull tape shall be approximately 4 feet longer than the run of conduit and shall be doubled back at least 2 feet at each raceway access point. The woven pull tape shall be anchored at each access point in a manner acceptable to the project manager.

D Measurement

The department will measure Woven Pull Tape by the linear foot of cable, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.3002	Woven Pull Tape	LF

Payment shall be full compensation for furnishing and installing woven pull tape; for making all connections.

327. Install Camera Power Cable, Item SPV.0090.3003; Install Cat-5e Cable, Item SPV.0090.3004.

A Description

This special provision describes the transporting and installing of state furnished Camera Power Cable, Cat-5e Cable, and Ethernet repeaters.

B Materials

Pick up the state furnished Camera Power Cable, Cat-5e cable, and Ethernet repeaters at the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical field unit at (414) 266-1170 to make arrangements for picking up the department furnished materials at least five working days prior to material pick-up.

Furnish all other necessary materials (connectors including wire nuts, splice kits, tape, insulating varnish or sealant and ground lug fasteners) ensuring all materials are in compliance with the WisDOT Qualified Electrical Products List.

C Construction

Install the Camera Power Cable (without splices) from the video detection cameras to the cabinet. Provide an extra 6-foot loop of cable in each pull box. Terminate the ends of the cable and connect the cable to the video detection cameras per the adaptable traffic signal video detection camera manufacturer's specifications.

Install the Cat-5e Cable from the video detection cameras to the cabinet. Provide an extra 6-foot loop of cable in each pull box. Terminate the ends of the cable and connect the cable to the video detection cameras per the adaptable traffic signal video detection camera manufacturer's specifications. Cat-5e Cable runs longer than 300-feet require an Ethernet repeater. Provide an extra 12-foot loop of cable at locations provided by the engineer and install the state furnished Ethernet repeaters per the manufacturer's specifications. All open field ends shall be taped and covered with a sealant in accordance to standard spec 655.3.1of the standard specifications.

Mark the cabinet end of the Camera Power Cable and Cat-5e Cable appropriately to indicate the equipment label (i.e. V1, V2, etc.) in the traffic signal control cabinet. Neatly coil a minimum of 15-feet of extra cable in the traffic signal cabinet for connection to the traffic signal cabinet equipment by others.

Notify department's Electrical field unit at (414) 266-1170 upon installation completion at each intersection.

D Measurement

The department will measure Install Camera Power Cable and Install Cat-5e Cable by the linear foot of cable, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.3003	Install Camera Power Cable	LS
SPV.0090.3004	Install Cat-5e Cable	LS

Payment is full compensation for transporting and installing the Video Camera Power Cable, Cat-5e Cable, and Ethernet Repeaters; for making all connections; for furnishing and installing all connectors, including wire nuts, splice kits, tape, insulating varnish or sealant and ground lug fasteners; and for testing.

328. Fence Decorative Bridge, Item SPV.0090.4400; Fence Decorative Wing, Item SPV.0090.4410; Fence Decorative Wall, Item SPV.0090.4420.

A Description

Fabricate, galvanize, paint, deliver and install decorative fencing on bridge superstructures, wing walls, and retaining walls.

B Materials

B.1 General

Utilize only materials meeting the requirements as shown on the plans and the applicable provisions of the standard specifications as follows:

- Structural Steel: standard spec 506.2.2
- Steel Mesh: standard spec 505.2.5
- Painting: standard specs 517.2 and 517.3

Blast steel clean prior to fabrication, per SSPC-SP 6 and galvanize according to ASTM A 123. Supply all bolts, nuts and washers as factory galvanized according to ASTM A 153. Repair zinc coating damaged during fabrication as specified in standard spec 635.3.4. Grind the welded joints shown in the plans to a smooth finish.

Steel preparation includes the chamfering of sharp edges. Flatten all sharp edges by a single pass of a grinder or suitable device along the sharp edge. Condition any thermal cut edges before blast cleaning by shallow grinding or other cleaning to remove any hardened surface layer. Remove all evident steel defects exposed in accordance to AASHTO M 160 prior to blast cleaning.

Construct the fence fabric of 8 GA. 2-inch by 2-inch welded wire mesh galvanized to ASTM A 123 and then covered with a polymer-coating conforming to the following requirements:

Thickness of Polymer-Coating:	ASTM F668
Adhesion:	ASTM F668
Accelerated Aging Test:	ASTM F668, D1499
Mandrel Bend Test:	ASTM F668

Construct the polymer-coating of a dense impervious covering applied without voids, tears or cuts that reveal the galvanized mesh substrate. Visible roughness, bubbles, blisters and flaking in the polymer coating will be a basis for rejection. Utilize polymer-coating with color as specified in B.3 and conforming to the requirements of ASTM F934. Place the vertical wires of the mesh on the inside face (pedestrian / traffic side) of the fence.

B.2 Painting

Clean all galvanized surfaces to be painted per SSPC-SP1 to remove chlorides, sulfates, zinc salts, oil, dirt, organic matter and other contaminants. Then brush blast clean the cleaned galvanized surface per SSPC-SP7 to create a slight angular surface profile (1.0 – 1.5 mils suggested) for paint adhesion. Do not fracture the galvanized finish or remove any dry film thickness during the brush blast cleaning process.

After cleaning provide a tie coat from an approved coating system that is specifically intended to be used on a galvanized surface. The tie coat shall etch the galvanized surface and prepare the surface for the top coat. Apply a top coat matching the specified color. Utilize a contracting color for the tie and top coats. Use a pre-approved top coat that is

resistant to the effects of the sun, and is suitable for use in a marine environment. Paint the various decorative fence components with the tie and top coats before final assembly of the fence panels. Do not damage the painted surface during panel assembly or fence installation.

Use one of the qualified paint sources and products given below. An equivalent system may be used with the written approval of the engineer.

Producer	Coat	Products	Dry Film Minimum Thickness (mils)	Minimum Time Between Coats (hours)
Sherwin Williams 1051 Perimeter Drive, Suite 710 Schaumburg, IL 60173 (847) 330-1562	Tie	Recoatable Epoxy Primer B67-5 Series/B67V5	2.0 to 4.0	6
	Top	Acrolon 218 HS Polyurethane , B65-650	2.0 to 4.0	NA
Carboline 350 Hanley Industrial St. Louis, MO 63144 (314) 644-1000	Tie	Rustbond Penetrating Sealer FC	1	36
	Top	Carboline 133 LH	4	NA
Wasser Corporation 4118 B Place NW Suite B Auburn, WA 98001	Tie	MC-Ferrox B 100	3.0 to 5.0	8
	Top	MC-Luster 100	2.0 to 4.0	NA

B.2 Color
Match Federal Color 27038 – Black, for the finished color for the coating system for decorative fencing.

C Construction
Provide shop drawings in accordance to the requirements of standard spec 506.3.2. Provide shop drawings containing material sizes and types, weld sizes and locations, and all necessary details, dimensions, and information to allow fabrication of the fence in conformance with the requirements of the contract. Obtain shop drawing review and acceptance prior to beginning fabrication.

Provide a full sized painted 6-foot by 10-foot long fence test panel. Deliver the test panel to the job site within 60 days of the award of the contract. Unload and set up the test panel in an area designated by the engineer. Obtain test panel acceptance prior to beginning fabrication of fences.

During construction and at the time of delivery the engineer will inspect the frame components. Obtain engineer acceptance of the product after the delivery is unloaded on the site. After the product is unloaded, signify in writing that the fence was received in acceptable condition per the engineer's inspection. Any damage to the fence panels after the acceptable delivery will be the responsibility of the installation contractor.

Conform all welding to the applicable requirements of standard spec 506. Obtain the approval of the engineer prior to any field welding, field cutting, or drilling.

Minimize the number and size of touch-up spots during construction. Follow the manufacturer's recommendations for damaged area repairs. Final acceptance will not be granted without engineer approval of the field paint appearance.

Provide the engineer with the name, address, and phone number of a representative of the fence fabricator for future coordination.

During handling, protect finish coating from damage. If damaged during handling, the fencing may be rejected by the engineer or engineer may direct the fabricator to repair the finish in accordance to the manufacturer's recommendations. Provide the engineer a copy of the manufacturer's recommended repair procedure and materials before repairing damaged coatings.

D Measurement

The department will measure Fence Decorative Bridge, Fence Decorative Wing and Fence Decorative Wall by the linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4400	Fence Decorative Bridge	LF
SPV.0090.4410	Fence Decorative Wing	LF
SPV.0090.4420	Fence Decorative Wall	LF

Payment is full compensation for fabricating, polymer-coating welded wire mesh, galvanizing, painting, and delivering test panel to site; fabricating, furnishing, delivering and unloading fence panels, lighting access panels, posts; installing fence posts and panels and hardware; for preparing shop drawings, painting, and galvanizing metal fence components.

329. Piling Sleeves, Item SPV.0090.4430.

A Description

The work under this item consists of furnishing and installing a corrugated steel piling sleeve or pile wrap in the reinforced earth zone of mechanically stabilized earth (MSE) retaining walls and other locations shown in the plans. Perform work in accordance to pertinent portions of standard specs 520 and 521, the plans, and as herein after provided

B Materials

B.1 Pipe Sleeves

The piling sleeve must meet the requirements of standard spec 521.2.2 for corrugated steel pipe.

B.2 Pile Wrap

As an alternative to pipe sleeves and if accepted by the engineer, provide a pile wrap that completely encases the perimeter of the pile and separates the pile from the surrounding soil. The provided pile wrap product shall be specifically intended to reduce or eliminate down drag loads on driven piles. Submit proposed pile wrap product data sheets and installation requirements to the engineer for acceptance.

C Construction

Set the piling sleeve within 1 inch of the required position indicated on the plans prior to placing the reinforced earth. Brace sleeve to maintain position within 2 inches of required position as backfilling proceeds. Place soil reinforcing mats around sleeve.

Is using pile wrap in lieu of pipe sleeves, install the pile wrap on the top portion of the piles that will be in the MSE soil reinforced zone or other limits shown on the plans prior placing the reinforced earth backfill around the piles. Install the pile wrap and place backfill around the wrapped pile in accordance to the pile wrap manufacturer's installation requirements and recommendations.

Any damage that would hinder the installation of a HP pile must be corrected prior to placing any additional reinforced earth.

After completion of pile installation inside a piling sleeve, backfill the void space around the pile within the sleeve with sand or other approved materials.

D Measurement

The department will measure Piling Sleeves by the linear foot, acceptably installed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4430	Piling Sleeves	LF

Payment is full compensation for furnishing and installing the piling sleeve or pile wrap; and for furnishing and placing backfill inside the sleeve after pile installation.

330. Foundation Drilling, Item SPV.0090.4440.

A Description

Work under this item consists of drilling or otherwise excavating holes for the subsequent installation of soldier piles and construction of concrete masonry soldier pile footings. Perform work in accordance to pertinent parts of the standard specifications, the plans, and these special provisions.

B (Vacant)

C Construction

C1 General

The contractor is responsible for drilling or excavating and maintaining a stable open hole for subsequent installation of soldier piles and construction of concrete masonry soldier pile footings. The subsurface conditions vary across the project site and are not necessarily the same along the length of each retaining wall in the project. Anticipate the possibility of encountering randomly interlaced seams of loose, permeable sand or gravel of substantial thickness situated within glacial clays and till deposits; saturated soils; ground water; isolated cobbles or boulders; and nested cobbles and boulders at any concrete masonry solider pile footing location when selecting equipment and methods for constructing the holes. Partial or full depth temporary casing, slurry or a combination thereof, may be required to maintain the stability of the excavated drill hole prior to placement of the soldier pile in the hole and filling the hole with concrete.

The contractor is strongly advised to obtain and review the Geotechnical Exploration and Foundation Evaluation Reports for the applicable retaining wall structure for which concrete masonry soldier pile footings are being constructed. See article “Geotechnical Investigation Information” in these special provisions for information on obtaining geotechnical reports

Perform all work in accordance to the rules and regulations of the local, state, and federal governing authorities having jurisdiction over the project site.

C2 Installation Plan Submittal

Determine the proper means, methods, and procedure for accomplishing the work as specified herein and on the plans. Submit the proposed method for foundation drilling before beginning construction. If slurry is proposed to be used for excavation stabilization, the submitted installation plan must include all details related to use of slurry including:

Type - Include slurry manufacture literature and mixing instructions.
Equipment – Storage /mixing tanks, containment vessels, pumps, mixers, hoses, valves.
Operations – Slurry mixing, pumping, containment, and recovery procedures.
Quality Control – Slurry quality control procedures and testing during construction.

C3 Excavation
Bore or otherwise excavate holes to the diameter and depth as shown on the plans. If necessary, use temporary casing, slurry or alternative methods during drilling methods to maintain a stable open hole. Do not leave excavated, uncased holes open overnight prior to filling with concrete. If bentonite or equivalent slurry is used to maintain an open hole, prevent spillage of the slurry onto adjacent roadways or into adjacent waterways. Locate the soldier pile holes to within the following tolerances:

Horizontal Location	3 inch
Vertical Location	1 inch
Vertical Alignment	1/8 inch/ft
Hole Diameter	30 inch; -0 inch; +2 inch

Provide equipment for checking the dimensions and alignment of each shaft. Remove loose material from the bottom of the shaft. For holes drilled or excavated without slurry, no more than 3 inches of standing water is permitted in the bottom of the drilled hole prior to beginning solider pile installation and immediately prior to placing concrete masonry in the hole around the solider pile.

C4 Obstructions
Obstructions are defined as man-made objects that when encountered, stop or significantly impede downward progress of the excavation to less than 12-inches for 60 minutes or longer using conventional excavation techniques or augers operating at normal power, torque and downward thrust. Obstructions include man-made objects and may include, but are not limited to old concrete foundations, piling, abandoned utilities or buried pavements. Obstructions are further classified as “known obstructions” which are identified on the plans, and “unknown obstructions” that may be encountered but are not identified on the plans.

Employ special tools and/or procedures as necessary when obstructions are encountered and the contractor cannot advance the excavation more than 12-inches in 60 minutes using conventional rock augers fitted with teeth, drilling buckets, or under reaming tools operating at normal power, torque, and down thrust. Clear the obstructions in such a manner so as not to compromise the sidewall integrity or stability of the drilled, open hole. Special procedures and tools that may be required include, but are not limited to; chisels, breakers, core barrels, air hammer tools, and hand excavation. Other methods for obstruction removal such as temporary casing or hole diameter increase can be employed to aid in the removal if acceptable to the engineer. Blasting is not permitted.

Natural deposits, including boulders, cobbles, nested cobbles and other deposits may be encountered that impede the excavation to less than 12-inches for 60 minutes or longer as noted above for obstructions. Natural deposits, regardless of makeup, depth, configuration, and consistency are not classified as obstructions as defined in this special provision or in the special provision Obstructions Foundation Drilling included in this contract.

D Measurement
The department will not measure Foundation Drilling. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment
The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4440	Foundation Drilling	LF

Payment is full compensation for drilling foundations; for drilling or otherwise excavating holes, clearing natural and known man-made obstructions, and for furnishing temporary casings, slurry or alternative hole stabilization methods.

Removal of unknown man-made subsurface obstructions for Foundation Drilling will be measured and paid for separately under the bid item, Obstructions Foundation Drilling included in the contract.

331. Pre-Boring Special, Item SPV.0090.4445.

A Description
This special provision describes pre-boring holes for driven piles next to an existing storm sewer, in accordance to standard spec 550, as indicated on the plans, and as hereinafter provided.

B (Vacant)

C Construction
Pre-bore holes to the diameter and depth as shown on the plans, in accordance to standard specs 550.3.9.1 and 550.3.9.2, and as hereinafter provided.

Install temporary casing and use water or slurry during pre-boring operations. Do not remove casing, slurry or water until the pile is driven to the requirements indicated on the plans and the hole is backfilled with “Backfill Controlled Low Strength”.

If natural or manmade obstructions are encountered during pre-boring, clear the obstructions in such a manner so as not to compromise the sidewall integrity or stability of the drilled open hole.

Do not leave excavated, uncased holes open overnight prior to filling with “Backfill Controlled Low Strength”. Prevent spillage of the slurry onto adjacent roadways or into adjacent waterways. Locate the driven pile holes to within the following tolerances:

Horizontal Location	3 inch
Vertical Location	1 inch
Vertical Alignment	1/8 inch/ft
Hole Diameter	30 inch; -0 inch; +2 inch

Provide equipment for checking the dimensions and alignment of each shaft. Remove loose material from the bottom of the shaft.

Submit a Pre-Boring plan to the engineer for approval before beginning construction. Perform all work in accordance to the rules and regulations of the local, state, and federal governing authorities having jurisdiction over the project site.

Anticipate the possibility of encountering randomly interlaced seams of loose, permeable sand or gravel of substantial thickness situated within glacial clays and till deposits; saturated soils; ground water; isolated cobbles or boulders; and nested cobbles and boulders at any driven pile location when selecting equipment and methods for pre-boring the holes.

The contractor is strongly advised to obtain and review the Geotechnical Exploration and Foundation Evaluation Reports for the applicable structure. See the article "Geotechnical Investigation Information" in these special provisions for information on obtaining geotechnical reports.

D Measurement

The department will measure Pre-Boring Special by the linear foot acceptably completed as measured from the bottom of footing elevation shown on the plan to the pre-boring elevation shown on the plan. The department will not measure Pre-Boring Special outside these limits.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4445	Pre-Boring Special	LF

Payment is full compensation for drilling the pre-boring holes; for clearing obstructions if encountered during pre-boring including natural or manmade obstructions; for furnishing, installing, and removing temporary casings, slurry and water; for disposing of excess material. The department will not pay for pre-boring outside of the limits that the contract plans indicate or for repairing damage to adjacent structures caused by the contractor's pre-boring operations.

The department will pay for Controlled Low Strength Backfill separately under "Backfill Controlled Low Strength" in the standard specifications.

332. Wall Secant Pile 47.24-Inch, Item SPV.0090.4450.

A Description

This special provision describes installing overlapping drilled shafts to form a secant pile retaining wall as shown on the plans.

A.1 Qualifications of the Contractor

The contractor performing the work described in these special provisions must have drilled shaft project(s) successfully completed within the last five years. The contractor must submit a list outlining their experience on at least five projects where they have successfully completed drilled shaft construction, including one project completed within the last five years. A minimum of two of the five projects must be tangent or secant pile wall projects. A separate wall project is defined as a tangent or secant pile wall or walls having a total of at least 3000 square feet of total wall area. The project experience must include at least one project completed in soil and groundwater conditions similar to those anticipated for this project. The project experience must include advancing the drilled shafts to a depth of at least 30 feet below the original ground surface. At least one project must show evidence of permanence with a five-year minimum age. The project experience documentation for each project must include a brief project description, detail the size of the shafts, construction methods used during installation, methods used for wall stabilization, local soil conditions, actual construction time and contact information consisting of an individual's name and current phone number. Contacts must be capable of verifying project participation.

The contractor must submit staff experience records of the engineer, drill operators, and on-site supervisors and crew chiefs who will be assigned to the project. The staff records must contain a summary of each individual's experience and it must be complete enough for the engineer to determine whether each individual has satisfied the following qualifications.

The contractor must assign an engineer to supervise the work who has at least eight years of drilled shaft experience and who has completed at least one successful secant pile or tangent pile retaining wall project. The assigned engineer's project experience must include at least one project completed in soil and groundwater conditions similar to those anticipated for this project. The contractor may not use consultants or manufacturer's representatives in order to meet the requirements of this section. Drill operators, and onsite supervisors and crew chiefs must have a minimum of one-year experience installing drilled shafts with the contractor's organization.

Submit the contractor's qualifications and staff experience records at the preconstruction meeting or 14 calendar days prior to the start of drilled shaft construction, whichever date is earlier. The engineer will accept or reject the contractor's qualifications and staff experience records within 14 calendar days after receipt of the submission. Do not start work on any secant pile retaining walls until acceptance of the contractor's qualifications, staff experience, and drilled shaft installation plan is given by the engineer. The engineer may suspend the secant pile work if the contractor substitutes unqualified personnel for accepted personnel during construction. If work is suspended due to the substitution of unqualified personnel, the adjustment in contract time resulting from the suspension of work will not be allowed.

B Materials

B.1 General

Concrete, drilling fluid, reinforcement and formwork shall be in accordance to the requirements of QMP Drilled Shafts, standard specifications, as shown on the plans, and as hereinafter provided.

In the event that the provisions of other specification clauses cause ambiguity or conflict with these special provisions, these special provisions shall take precedence unless otherwise accepted by the engineer.

B.2 Equipment

Equipment used for excavation, drilling, and cleaning operations shall be designed and intended to be used in conjunction with a full depth temporary casing for drilled shaft installation. The equipment shall be capable of installing and extracting a full depth temporary casing by means of a drill rig mounted overhead rotary drive or hydraulic oscillator, powered by the drill rig. The equipment shall have adequate capacity; including power, torque, and down thrust to install and extract a full depth temporary casing and excavate a hole to a depth equal to the maximum depth of the drilled shafts shown in the plans plus 15 feet, or plus 20 percent of their maximum depth, whichever is greater. Anticipate and make available at the job site all equipment necessary and essential to penetrate soft and hard soils, as well as cobbles and boulders and unidentified man-made obstructions, during the construction of the drilled shafts.

The equipment must be capable of advancing the temporary casing a minimum of 5-feett ahead of the excavation inside the casing until the shaft tip elevation is reached. No excavation ahead of the casing shall be permitted without the engineer’s approval.

The overhead rotary drive equipment shall be capable of installing and extracting the full depth temporary casing by means of rotational or oscillatory motion. Installation or removal of temporary casing by impact driving or vibration is not permitted. Advancing and installing the temporary casing by means of excavation ahead of the casing is not permitted.

Where hard soils, or other material including natural or man-made obstructions are encountered and cannot be drilled using conventional earth or rock augers, drilling buckets, and/or over reaming tools, provide drilling equipment including but not limited to rock core barrels, rock tools, down the hole hammer, chisels, air tools, or any other equipment necessary to advance the drilled shaft excavation to the depth and size as shown on the plans.

When applicable, or required by the engineer, provide equipment that produces a stable slurry suspension, mechanical agitation, and a pipeline or other safe methods of transporting the slurry to the drilled shaft.

B.3 Temporary Casing

Temporary casing shall be steel; rigid, smooth, clean, watertight, and of ample strength to withstand both handling and installation stresses and the pressure of both concrete and the surrounding earth materials. Temporary casing must be of sufficient length to provide temporary casing the full length of excavation for all drilled shafts. Segmented casing, if used, must be segmented using flush bolted, casing joints. Telescopic casing is not permitted. The diameter of casing shall not be less than the specified size of the drilled shaft. All casing diameters shown on the plans refer to outside diameter, O.D. dimensions.

B.4 Temporary Working Surface

Fill material, if required, to create a working surface for wall construction can be any suitable material approved by the engineer containing no logs, stumps, brush, perishables, or other materials such as stone or broken concrete that may affect the drilling of the shafts. Material that will remain permanently shall consist only of appropriate embankment fill when placed in association with a roadway, conforming to the requirements of standard spec 207.2.

B.5 Reinforcing Steel and Spacers

Deformed reinforcing bars shall comply with the size, dimension, spacing, and details shown on the plans. In addition, they shall conform to AASHTO M31, Grade 60, and all the pertinent requirements of standard spec 505. Non-corrosive wheel type spacers and boots shall be used to properly position the reinforcing steel. All reinforcing steel shall be 100% wire tied between the vertical reinforcement and ties.

B.6 Guide Walls

Provide steel plate template at each secant pile location to accurately locate and maintain the position of the wall as shown on the plans. Provide concrete, reinforcement and formwork for guide walls in accordance to the requirements of standard spec 501, 502 and 505 and as hereinafter provided.

B.7 Crosshole Sonic Logging (CSL) Tubes

Access tubes for CSL testing shall be 2 inches I.D. schedule 40 steel pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S. Pipes shall have a round, regular internal diameter, free of defects or obstructions; including any defect at the pipe joints, to permit the free unobstructed passage of source and receiver probes. Each tube or steel pipe shall be fitted with a watertight shoe onto the bottom and a removable cap at the top. Both, the shoe and cap shall be watertight and free from corrosion. The internal and external faces of the CSL tubes shall be clean to ensure passage of the probes and produce a good bond with the concrete.

C Construction

C.1 Drilled Shaft Installation Plan

C.1.1 General

Prepare and submit a Drilled Shaft Installation Plan at the preconstruction meeting or at least 14 calendar days prior to beginning drilled shaft construction, whichever date is earlier. Submit the Drilled Shaft Installation Plan to the engineer for review. The engineer

will accept the plan as submitted or return the plan with requested revisions. The initial acceptance of the engineer shall be considered a preliminary acceptance with final acceptance pending the successful completion and acceptance of the Secant Pile Trial Wall Panel included in the contract. Do not start any production drilled shaft installation until the contractor and engineer agree to and the engineer accepts the Drilled Shaft Installation Plan. Acceptance of the installation plan does not relieve the contractor of responsibility for successful completion of the drilled shafts.

C.1.2 Subsurface Conditions

The subsurface conditions vary across the project site and are not necessarily the same along the length of structures containing secant pile walls. Anticipate the possibility of encountering loose permeable sand or gravel seams of substantial thickness interlaced randomly within glacial clay and till deposits, saturated soils and ground water, isolated cobbles or boulders, and nestled cobbles and boulders while excavating and installing secant drilled shafts along the length of secant pile wall structures within this contract.

The contractor is strongly advised to obtain and review the combined Geotechnical Exploration and Foundation Evaluation Report for the wall structure for which the secant pile wall is being constructed. See article "Geotechnical Investigation Information" in these special provisions for information on obtaining the geotechnical report.

C.1.3 Submittals

The submitted Drilled Shaft Installation Plan shall include the following:

a. **Job Site Visit**. Acknowledge that the job site was visited to verify the site conditions with regard to entrance, access, overhead lines, subsurface features, clearing and grubbing, permitting, and collecting all information necessary to plan and execute the installation of the drilled shafts.
b. **Plan to Protect Existing Structures and Facilities**. Outline the steps to be taken during drilled shaft installation to protect adjacent or nearby structures and utilities.
c. **Low Overhead Clearance Provisions.** Outline the equipment to be used and special steps to be implemented to safely install the secant pile drilled shafts under the existing overhead utility lines shown on the plans.
d. **Details of Environmental Control Procedures**. Provide plan to prevent loss of slurry or concrete into waterways, project areas, or protected areas. Detail method to ensure the compliance with state and federal environmental regulations during drilled shaft construction.
e. **List of Proposed Equipment**. Include details of proposed templates; number and sizes of cranes; number and sizes of drills, include rotary torque, crowd force drills, and maximum drilling depth; diameter, length, and reach of augers, bailing buckets, guide walls, templates, and roller bits; cleaning equipment including cleaning buckets, submersible pumps, or air-lifted pumps; size of de-sanding equipment and slurry pumps; soil/rock-coring sampling equipment; inspecting drilled shaft apparatus; length and diameter of tremie or size of concrete pumps; size, length, and thickness of casings; over reaming equipment; and all relevant equipment necessary to complete the drilled shaft installation. Acceptance of the installation plan by the department does not relieve the contractor responsibility to

provide other equipment, if necessary, to achieve satisfactory wall installations meeting the requirements of this special provision.

f. **Details of Guide Wall Design and Installation.** Provide details of required guide wall design and construction.

g. **Details of Sequence of Drilled Shaft Installation and Time for Construction Operations**. Include a layout of the drilled shaft installation sequence and setting template(s). Time for installing full depth temporary casing, sealing casing, excavation and/or drilling time, drilled shaft cleaning, rock coring, drilled shaft inspection, concrete placement. Consider the effect of construction operations of one drilled shaft onto the adjacent drilled shaft(s) and utilities and avoid construction conflicts that will affect the quality or integrity of the completed work. Indicate when and what construction sequence modifications shall be performed under atypical situations, i.e, weekend or holiday shutdowns, unanticipated shutdowns due to equipment issues, etc.

h. **Proposed Drilled Shaft Installation Procedure(s)**. Provide details of the proposed shaft installation procedures, including coring or drilling rock or obstructions or steep sloping surfaces, when required, and meeting the minimum installation requirements set forth in subsection C.3. Method for identification of the competent or bearing material before finalizing the excavation. Method for monitoring verticality of the drilled shaft walls during excavation, and details of proposed corrective measures to be implemented for shafts out of tolerance. Details of the methods and means of preventing displacement of the casing and/or drilled shaft during installation.

i. **Details of Slurry Operations.** Include slurry type, methods to mix, circulation, de-sanding, and test the slurry to comply with these special provisions. Submit proposed laboratories for testing and documenting test results.

j. **Inspection and Cleaning**. Methods to clean and inspect the drilled shaft excavation prior to reinforcement placement.

k. **Crosshole Sonic Logging (CSL).** Method to install and secure the CSL pipes to the reinforcing cage or steel core, along with the proposed selection of pipe and size.

l. **Details of Reinforcement Steel Placement During Construction**. Include methods to ensure cage centering and cover; proper cage orientation, cage integrity while lifted during placement, number of cranes, number of lift points, and number of spreader bars; number and location of bottom and side spacers; cage support; and tie downs during concrete placement.

m. **Concrete Placement Plan**. The purpose of the Concrete Placement Plan is to ensure that a sufficient quantity of concrete is at the job site or in transit to the job site so that the entire pour can be done without delay. Include location of the concrete plant, number of trucks, estimated delivery times, estimated time between trucks, and number of trucks at the site before placement begins. Indicate the use of tremie or concrete pump lines and details of the seal to be used at the bottom end of the tremie or concrete pump line. Breakdowns of concrete plants, trucks, or traffic problems shall be considered under this Concrete Placement Plan. The contractor shall be aware of and account for batch, travel, and concrete placement times.

Include an estimate of the concrete placement time per drilled shaft. When applicable, detail excavation to grade and finishing of the drilled shafts.

n. **Casing Removal**. Include the details and means by which the contractor intends to remove full depth temporary casings and provide information about staged temporary casing removal when applicable.
o. **Methods of Handling and Disposal of Spoil Excavation, Waste Slurry, Waste Concrete, and Drilled Shaft Cutoffs**. Present sufficient details to the engineer to evaluate the adequacy and compliance of the contractor's methods of disposal with the standard specifications, including all related environmental permits and local regulations.
p. **Other Information** requested on the plans or by the engineer.

C.1.4 Acceptance

The department will evaluate the Drilled Shaft Installation Plan for conformance with the requirements of these special provisions. Within 14 calendar days after receipt of the Drilled Shaft Installation Plan, the engineer will notify the contractor of the preliminary acceptance of the plan, or if additional information and/or changes are required. Any unacceptable part of the Installation Plan will require resubmission. The contractor must resubmit the drilled shaft installation plan for evaluation and review with the necessary changes or additional information provided. The engineer will provide a written notice of preliminary acceptance or rejection of contractor's resubmitted Drilled Shaft Installation Plan within 14 calendar days after its receipt. The accepted contractor's Drilled Shaft Installation Plan will become final after the successful completion and acceptance of the Secant Pile Trial Wall Panel demonstrating satisfactory performance in the field of the contractor's Drilled Shaft Installation Plan.

After assessment or reassessment of the Drilled Shaft Installation Plan and the Secant Pile Trial Wall Panel have been made and the engineer has accepted both, no changes to the Drilled Shaft Installation plan can be made without written consent of the engineer.

C.2 Secant Pile Trial Wall Panel

After the Drilled Shaft Installation Plan has been accepted, consecutive drilled shafts forming a non-production, secant pile trial wall panel shall be constructed by the contractor or subcontractor who will perform the drilled shaft production work for the contract. Construction shall be in accordance to the submitted Secant Pile Trial Wall Panel and this special provision. During secant pile trial wall panel construction, the contractor must adhere to and demonstrate the adequacy of the submitted Drilled Shaft Installation Plan.

Construction of the secant pile trial wall panel will be used to determine if the contractor's methods, equipment, personnel, and proposed procedures are suitable to reliably produce stable drilled shaft excavations and secant walls that meet the requirements of these special provisions. CSL tests may be performed by the engineer, as part of the evaluation of each trial panel. Revise construction methods and equipment as necessary during this stage or at any time during the installation of production shafts to satisfactorily complete the wall construction in accordance to these special provisions.

Failure of the contractor to demonstrate the adequacy of the installation procedure(s) or equipment shall cause the engineer to require appropriate modifications as necessary. Comply to satisfactorily demonstrate the adequacy of the proposed method(s) or equipment, or construct additional secant pile trial wall panel(s) as indicated by the engineer at no additional cost for the department.

C.3 Drilled Shaft Installation

C.3.1 General

Carry out the work in accordance to the accepted drilled shaft installation plan and as demonstrated during installation of the trial secant pile wall panel. The resulting installation plan shall include length of full depth temporary casing, details of the constituent materials of any drilling fluid or means used for stabilization of the bottom of the excavation, the method of inspection, details of the concrete design mix, concreting method, the minimum time between the completion of one shaft and the commencement of the next, and the pattern of construction.

Ensure that damage does not occur to the completed shafts as a result of work on adjacent shafts. Submit to the engineer a drilled shaft installation sequence. The proposed sequence and timing of shaft installation shall be such that the installation work will not cause any damage to adjacent shafts. The shaft installation shall not commence until acceptance of the engineer has been obtained.

C.3.2 Guide Walls

The design and construction of guide walls is the responsibility of the contractor and shall take into account the shaft size, ground conditions and equipment used on site to ensure stability and control tolerances. The minimum depth of concrete guide walls shall be 4 feet, and the minimum shoulder width shall be 1.5 feet. Larger size guide walls may be required if the surface soils are loose or otherwise of insufficient strength to prevent movement of the guide walls during construction or if drilled shafts are placed using minimum sized guide walls and do not meet required positional tolerances.

C.3.3 Temporary Working Surface

Use a temporary working surface to provide a level surface at the top of shafts for drilling where needed.

C.3.4 Forcible Correction

Where shafts have not been positioned within the specified limits no method of forcible correction will be permitted.

C.3.5 Records

Keep a work record of all shafts installed. Give a copy of the record including each day to the engineer within 24 hours of that day’s work being completed. The engineer will review and agree to the daily record form format before drilled shaft works commence. Incorporate any comment by the engineer into the record form. Note all unexpected drilling or installation conditions in the records.

C.3.6 Methods of Drilled Shaft Installation

C.3.6.1 General

The temporary casing installation method and concrete placement in the wet using a tremie pipe shall be used to produce a sound and durable secant pile wall free of defects. When a particular installation method is required in the special provisions, only that method of construction shall be used. The use of a permanent casing method is not permitted. Submit to the engineer for acceptance his selected method of construction in the Drilled Shaft Installation Plan described in these special provisions.

The use of full length temporary casing, with the use of water or slurry, is required for the installation of all drilled shafts on the project. Full depth temporary casing shall be installed by using overhead rotary drive equipment or by using hydraulic oscillating equipment specifically intended for temporary casing installation and extraction. Installation of full depth temporary casing by means of driving or vibrating is not permitted. Advancing and installing casing by means of excavation ahead of the casing is not permitted. During temporary casing installation and shaft excavation, advance the tip of the temporary casing a minimum of 5 feet ahead of the tip of the excavation, until the bottom of the excavation is reached.

After the temporary casing is in place, excavate inside the casing, while keeping the shaft full of water or slurry, to the planned shaft tip elevation using the wet excavation techniques described below. Clean the bottom of the excavation; test the drilling fluid for compliance with these special provisions. Before extracting the temporary casing, ensure that the level of fresh concrete inside the casing is at such level that the pressure of its hydrostatic head displaces up and out the fluid trapped in the annular space between the casing and the drilled shaft wall.

C.3.6.2 Dry Installation Method

The dry method of shaft installation is not permitted.

C.3.6.3 Temporary Casing Installation Method

The temporary casing method of shaft installation consists of supporting the shaft excavation by means of full depth temporary casing that is advanced a minimum of 5 feet ahead of the excavation until the drilled shaft tip is reached. This includes excavating, removing, and cleaning all accumulated loose material from within the cased excavation, placing the reinforcement cage, and placing the shaft concrete in the wet excavation. The concrete cannot be placed into the wet excavation using free fall. Concrete shall be placed under water in wet excavation using proper tremie procedures to direct the concrete under the water inside the shaft excavation and displace the water.

C.3.6.4 Wet Installation Method

The wet installation method consists of drilled shaft installation by means of full depth temporary casing in conjunction with the use of slurry, drilling fluid, or water to maintain stability against heave and blow-in in the bottom of the excavation. Use the wet installation method for all drilled secant pile shafts in the contract. When using the wet

method below the groundwater table, all drilled shaft operations shall be accomplished while maintaining a positive head of fluid of sufficient depth above the water table to avoid heaving or blow-in of the bottom of the excavation.

C.3.6.5 Permanent Casing Method

Do not use the permanent casing method.

C.3.7 Excavations

C.3.7.1 General

Excavations required for the drilled shafts shall be performed through whatever materials are encountered to the dimensions and elevations shown in the plans, or as directed by the engineer. The excavation and installation method shall be suitable for the intended results and materials encountered. Blasting is not permitted.

Maintain a construction log during the drilled shaft excavation. The construction log will include information such as ground elevation, ground water elevation, sequence number, method of installation, machines and tools employed, drilling fluids employed, drilling times, excavated materials and their particular elevations, soil samples and their particular elevations, and all other information relevant to the excavation process that will assist the engineer in evaluating the foundation. Information shall also include proposed methods for disposal of excavated material and slurry in accordance to state and local environmental regulations, codes and ordinances, the standard specifications, or as directed by the engineer.

C.3.7.2 Templates and Guide Walls

Templates are required for installation of all scant pile wall foundations to aid in achieving position and alignment of the installed drilled shafts within specified tolerances. Guide walls are also required for the installation of all secant pile drilled shafts to aid in achieving specified tolerances for location and verticality of the installed drilled shafts.

C.3.7.3 Protection of Existing Structures

Take all reasonable precautions to prevent damage to existing structures and utilities. These measures shall include, but are not limited to, subsidence control during installation of temporary casings or excavation inside temporary casings.

Where drilled shafts are to be installed in conjunction with embankment placement, drilled shafts shall be constructed after placement of the fill, unless otherwise shown in the plans, or accepted by the engineer. If fill is required to be placed after completion of the drilled shafts, the footing cap shall be done, as closely as possible, after the fill is in placed and compacted to final grade leaving only the space necessary for the construction of the caps.

C.3.7.4 Drilled Shaft Excavation

Provide the necessary equipment to remove and dispose of all materials encountered in the drilled shaft excavation to the dimension and elevation shown on the plans, or as directed by the engineer. Contractor’s excavation equipment may include but is not limited to earth augers and rotary drills designed to work within full depth temporary casing. Unless

otherwise shown on the plans, the drilled shaft excavations shall be vertical bored holes extending from the ground surface down to design tip elevation.

C.3.7.5 Obstructions

Obstructions are defined as man-made objects that when encountered, stop or significantly impede downward progress of the temporary casing installation or excavation to less than 12-inches for 60 minutes or longer under normal applied thrust and torque. Obstructions include man-made objects and may include, but are not limited to old concrete foundations, piling, abandoned utilities or buried pavements. Obstructions are further classified as "known obstructions" which are identified on the plans, and "unknown obstructions" that may be encountered but are not identified on the plans.

Employ special tools and/or procedures as necessary when obstructions are encountered and the contractor cannot advance the excavation more than 12-inches in 60 minutes using conventional rock augers fitted with teeth, drilling buckets, or under reaming tools operating at normal power, torque, and down thrust. Special procedures and tools that may be required, but are not limited to; chisels, breakers, core barrels, air hammer tools, and hand excavation. Other methods for obstruction removal such as temporary casing or hole diameter increase can be employed to aid in the removal if acceptable to the engineer. Blasting is not permitted.

Natural deposits, including boulders, cobbles, nested cobbles and other deposits may be encountered that impede the installation and advancement of the temporary casing and excavation to less than 12-inches for 60 minutes or longer as noted above for obstructions. Natural deposits, regardless of makeup, depth, configuration, and consistency are not classified as obstructions as defined in this special provision or in the special provision Obstructions Wall Secant Pile included in the contract.

C.3.7.6 Lost Tools

Drilling tools that are lost in the excavation shall not be considered obstructions and shall be promptly removed. All costs due to removal of lost tools shall be borne by the contractor including costs associated with hole degradation during removal operations or time while the hole remains open.

C.3.7.7 Inspections and Cleanliness of Excavation

Provide the details of drilled shaft inspection and cleanliness within the Drilled Shaft Installation Plan, required by subsection C.1.3 of this specification. Provide equipment and tools for checking the dimensions and alignment of each drilled shaft excavation, and shall coordinate schedules for inspection of the excavation with the engineer. Determine dimensions, alignment, and final depth of the drilled shafts after final cleaning. When applicable, provide safe access and egress to the engineer for inspection of the walls and bottom of the drilled shaft excavation prior to placement of the rebar cage or steel core section and concrete. After the drilled shaft excavation has been prepared for inspection, notify the engineer. The cleanliness and the bearing surface of the drilled shafts will be evaluated and accepted by the engineer. Unless the engineer specifies otherwise, the contractor's cleaning operation shall be considered sufficient when no more that 50 percent

of the bottom area of each shaft has less than 1/2-inch of sediment or debris at the time of hole acceptance just prior to steel positioning and concrete placement. The maximum depth of sediment or any debris at any location on the bottom of the shaft shall not exceed 1 1/2-inch at the time of concrete placement.

C.3.7.8 Safety

Do not permit any worker to enter the drilled shaft excavation for any reason unless a suitable casing has been installed, the water level has been lowered and stabilized below the level to be occupied, and suitable safety equipment and procedures have been provided to the personnel entering the excavation which includes OSHA certification for confined-entry-space.

C.3.7.9 Record Information

Provide to the department the drilled shaft excavation records and report any unusual observation to the engineer within 8 hours of discovery. Submit a draft of this form for each completed drilled shaft within 24 hours of shaft completion, and submit the final form within 2 weeks. Submit relevant information on a daily basis, or more frequently when variations occur, or as otherwise required by the engineer.

Report the drilled shaft construction progress in accordance to "Inspection and Reporting Forms," Drilled Shafts: Publication No. FHWA - IF-99-025, Appendix F, pages F-1 through F- 8.

C.3.8 Placement of Reinforcing Steel Cage

Prior to placement of the reinforcing steel and concrete, if slurry fluid was employed during the installation of the drilled shaft, test the slurry for compliance with this specification as described in the QMP, Drilled Shafts special provision. Slurry Tests shall be performed along the shaft and at the bottom of the shaft. Adjust the slurry properties as necessary to meet the specifications.

Prior to placement of the reinforceing steel and concrete, ensure that the C.3.7.7 cleanliness requirements are met.

Concrete or non-corrosive spacers shall be used at sufficient intervals not exceeding 10 feet along the reinforcement cage or the steel core. A minimum of 4 spacers shall be spaced evenly around the circumference of any shaft with a maximum space around the shaft circumference of 30 inches between any spacer (i.e. at any given level a 4-foot diameter shaft shall have 4 spacers). The first spacers shall be placed 1.5 feet from the bottom of the shaft with successive spacers at maximum intervals of 10 feet along the shaft. Spacers shall be of an appropriate diameter wheel to provide minimum clearance shown on the plans between the shaft excavation walls and the steel reinforcement.

C.3.9 Concrete Placement

C.3.9.1 General

For each secant shaft, place concrete continuously once concrete placement is started. No intermediate construction or cold joints are permitted within a single secant shaft.

Test the concrete delivered to the job site for compliance with the QMP Drill Shafts special provisions, the standard specifications and these special provisions.

C.3.9.2 Concrete Placement Time
Place concrete within three (3) hours after hole approval unless otherwise directed by the engineer. If the concrete is not placed within this time frame, the hole must be re-inspected and accepted by the engineer prior to concrete placement.

C.3.9.3 Concrete Placement by Free Fall
Concrete placement in drilled shafts by free fall is not permitted.

C.3.9.4 Concrete Placement by Tremie Pipes
Use tremie pipes to place the concrete inside the excavation. Keep the discharge end of the tremie a minimum of 7-feet below the level of the fresh concrete already placed inside the excavation to maintain a seal. The concrete shall flow into position by pressure through a steel tremie with a minimum diameter of 10-inches. Seal the bottom of the tremie using one way flap valve, before it is lowered into the wet excavation. If water/slurry enters the tremie pipe after concrete pouring has started, the tremie must be withdrawn, cleaned, resealed, and pouring restarted. If for some reason, the tremie is raised out of the fluid concrete or the concrete inside the drilled shaft drops down contaminating the tremie, completely remove and clean the tremie, then replace the seal at the bottom of the tremie, and lower the tremie back as far below as possible into the already placed concrete.

C.3.9.5 Concrete Placement by Concrete Pumps
Concrete pumps and concrete lines can be used to place concrete in drilled shafts rapidly or to deliver the concrete from a distant location. However, due to the need to disassemble the pump line to allow the removal of casing sections and potential air pockets, disruption in concrete flow, the concrete pump placement directly within the shaft is not permitted on this project. The pump must discharge the concrete into a minimum 10-inch diameter steel tremie with a bottom one way flap valve.

All pump lines and connections shall be watertight and must guide the concrete to the discharge point at the center of the rebar cage or steel core and drilled shaft excavation. The pump line may be flexible; however, inside the shaft use a minimum 10-inch diameter steel tremie pipe that can deliver the concrete in uninterrupted manner. Keep the bottom of the tremie or discharge orifice 7-feet below the surface of fluid concrete already placed to avoid sudden jumping of the pump line out of the excavation. Concreting shall continue until over pouring is evident at the top of the drilled shaft and until dark gray concrete (acceptable concrete) can be distinguished from the drilling fluid.

C.3.9.6 Casting Level
Over pour concrete above the top of shaft cut-off level to ensure that all concrete at and below cut-off level is homogeneous and free of laitance and deleterious materials.

C.3.9.7 Allowable Seepage Through Secant Pile Walls

Secant pile walls for retaining walls are intended to be ground water cut-off walls that retain and prevent the seepage of ground water from behind the wall.

Upon excavation and exposure of the secant wall face, repair any cracks, joints, or other defects in the exposed wall face where visible running water leaks are present exceeding 0.003 gallons per minute per square foot of exposed wall (approximately 0.4 fluid ounces per minute per square foot of exposed wall face). The intent of this provision is to limit water seepage through the secant pile wall joints to be less than any visible and measurable flow. Unacceptable measurable flow includes a regular and steady drip or accumulated surface wetness that can be observed running down the wall surface. Slight surface moisture on the exposed concrete wall face, as evidenced by damp and darker colored concrete is acceptable.

Any excavated exposed wall areas exhibiting measurable flow exceeding the limits of this article, as determined by the engineer, shall be repaired in such a manner to seal or lower the seepage through the wall to below the specified seepage limit. Submit method of repair to the engineer for acceptance prior to beginning repairs. Complete all such repairs prior to placing the cast-in-place concrete facing. Repairs, if necessary, will be at no additional cost to the department.

C.3.10 Construction Tolerances for Individual Shafts

Drilled shaft excavations or completed drilled shafts constructed out of the tolerance are unacceptable. The contractor is responsible for correcting to the satisfaction of the engineer all unacceptable work. Materials, construction, work, engineering analysis, and redesign necessary to complete corrections to out-of-tolerance excavations or completed drilled shafts shall be furnished to the department without either cost or time extension for the project. Comply with the following construction tolerances:

a. The front face (face closest to the cast-in-place facing) of the drilled shaft shall be initially positioned in the theoretical location as shown on the plans. The final, as constructed position of the front face of the drilled shaft shall be within a maximum of 2 inches in any direction from the theoretical position shown on the plans, unless otherwise permitted by the engineer prior to construction.
b. The vertical alignment of the drilled shaft excavation shall not vary by more than 1/16 inch per foot from plumb vertical.
c. Tolerances specified in a. and b. above are not additive. In no case shall there be a gap between secant piles. In the case that there is a gap in secant piles, develop a remedial action and submit to the engineer. Implement the engineer accepted remedial action plan at no additional cost to the department.
d. Any gap that occurs between adjacent secant drilled shafts shall be filled with grout, concrete or other methods developed by the contractor and accepted by the engineer, at no additional cost to the department.
e. If the wall is installed outside these tolerances affecting the design and appearance of the wall, develop and carry out immediate remedial measures subject to the acceptance of the engineer, at no additional cost to the department.

f. The diameter of the installed drilled shaft shall not be less than the diameter of the drilled shaft shown on the plans. Any conflicts due to a casing that is greater in diameter than the plan shaft diameter shall be remedied by the contractor. No additional compensation or schedule time shall be granted to the contractor for resolving any conflicts due to oversized casings. Employ equipment and methods of excavation to complete the drilled shaft excavation to a planar bottom, and the cutting edges of the equipment used during the excavation shall be normal to equipment's vertical axis within a tolerance of 3/8-inch per foot of diameter. The bottom of the drilled shaft excavation shall be normal to the axis of the drilled shaft within ¾-inch per foot of drilled shaft diameter.

h. Tolerances outlined in sections a. to e. herein shall be checked and finally met by the contractor prior to placement of the reinforced rebar cage or steel core inside the shaft hole.

i. After the concrete is poured, the top elevation of the installed drilled shaft shall be within 1-inch of the top elevation of the corresponding drilled shaft on the plans, and the top of the reinforcing steel cage shall be within the positional tolerance shown on the plans. The center of the reinforcing cage shall be the center of the drilled shaft.

j. Upon excavation of the wall shafts, any concrete present due to blowouts or protrusions that will not allow for a minimum 4-inch cast-in-place facing thickness over the face of the shafts, shall be removed at the contractor's expense. Cast-in-place facing alignment shall remain, as shown on the plans. Concrete removal if required, shall be done in such a manner as to not cause damage to the remaining portions of the shaft. This concrete removal criteria applies to all shafts installed and excavated in this contract.

k. The acceptance of the shafts tolerances shall be granted only after the excavation of the walls.

C.3.11 Non Destructive Testing Program

C.3.11.1 Shaft Integrity Testing (PIT)

The Pile Integrity Tester performs low strain integrity testing, alternatively called Sonic Testing, Pulse Echo, or Transient Response. The PIT can detect the presence and location of potentially dangerous defects such as cracks, necking, soil inclusions or voids and can determine pile length. The equipment and technique are well established, and specified by ASTM D5882.

Prior to beginning the PIT test, assure that the concrete top is accessible and cleaned. The test(s) will be performed by the engineer. The engineer will evaluate and analyze the PIT test results within 5 business days and provide the contractor with a response regarding the acceptability of the drilled shaft tested. The test shall be conducted on shafts that are at least 5 days old so that the concrete has attained minimum compressive strength necessary to perform the test.

C.3.11.2 Crosshole Sonic Logging Test

C.3.11.2.1 General

Crosshole Sonic Logging, (CSL), is a nondestructive testing (NDT) method that measures the time for an ultrasonic pulse to travel from a signal source inside an access tube to a receiver inside another access tube and evaluates the integrity of drilled shafts.

Install access tubes intended for Crosshole Sonic Logging CSL testing. The test(s) will be performed by the engineer. All CSL testing will be completed within 10 calendar days of concrete placement.

Prior to beginning the CSL test, ensure that the test probes can pass through and down the tubes to the bottom of every installed tube. If a tube is obstructed, the contractor, at no additional cost to the department, must core a hole within the drilled shaft and near the obstructed tube to the depth as directed by the engineer. The core shall be large enough to accommodate the probe through its full length.

The engineer will evaluate and analyze the CSL test results within 5 business days of their receipt and provide a response regarding the acceptability of the drilled shaft tested. The test shall be performed in accordance to ASTM D6760.

C.3.11.2.2 Installation Requirements

Drilled shafts must be fitted with CSL test tubes to evaluate their integrity as shown on the plans.

Install the access tubes or pipes as nearly parallel and far as possible from the longitudinal bars. The number of tubes to be installed per each drilled shaft diameter is as indicated in the table below:

Drilled Shaft Diameter	Number of CSL Tubes	Tube Spacing
47.24-Inches	4 minimum	As shown in plans

Securely attach the tubes to the interior of the reinforcement cage with a minimum concrete cover of three inches. The tubes may be attached to exterior of the cage when accepted by the engineer provided the minimum cover requirement of 3-inches over the tubes shall be maintained. In all cases, the tubes shall be as near to vertical and parallel as possible.

Extend the tubes from the bottom of the drilled shaft to at least 3-feet above the top of the drilled shaft, or 2-feet above the ground surface for shafts with cut-off below the ground surface. The tubes must be watertight and capped to prevent concrete or debris from entering during manipulation of the cage and concreting. Care must be taken during lifting and lowering the steel reinforcement so as not to damage the tubes. Fill the CSL tubes with potable water prior to concrete placement. For production shafts and upon completion of the CSL tests, remove all the water from the access tubes or drilled holes and fill them up with an approved grout.

C.3.12 Acceptance for Constructed Drilled Shafts

C.3.12.1 General

Any shafts that are not constructed and installed in accordance to these special provisions will be rejected by the engineer. Rejected shafts shall be replaced or rectified by the contractor and subject to the acceptance of the engineer. This includes reinstallation of shafts, and the design and construction of a modified wall and construction of additional shafts, at no additional cost to the department. The installation tolerances shall be measured upon excavation of the wall.

C.3.12.2 Based on Specifications

The department will only accept drilled shafts for secant pile retaining walls that conform to these special provisions. Drilled shafts and related work construction disregarding any specified requirement will not be accepted including:

a. Drilled shaft excavations constructed out-of-tolerance, as specified in this specification. When repair to an out-of-tolerance shaft is possible as determined by the engineer, fix the drilled shaft to meet the tolerances before the contractor is permitted to proceed further with any drilled shaft construction. All repairs must be acceptable to the engineer before the contractor may resume the drilled shaft work.
b. Excavation of a drilled shaft with slurry not conforming to the QMP, Drilled Shafts special provision.
c. Drilled shafts exhibiting cuttings from slurry at the drilled shaft bottom; showing soft, incomplete, or unclean bottoms; or presenting side sloughing and sedimentation at the bottom.
d. Shafts with honeycomb intrusions or concrete in which the fines have been washed out or water channels in concrete.
e. Horizontal discontinuity or severe necking in the drilled shaft concrete.
f. Quarter-moon-shaped soil intrusions on the sides of a drilled shaft.
g. Folded-in debris inside the drilled shaft.
h. Drilled shafts for which the mix design has been altered without the acceptance of the engineer, including adding of unauthorized water to a mix design to bring it to certain slump.
i. Drilled shafts constructed in a manner where concrete placement has failed to meet the required time and tolerances, or the methods of installation did not have the engineer’s acceptance.
j. Drilled shafts constructed with concrete not meeting the minimum 28-day compressive strength requirement indicated in the plans.

C.3.12.3 Based on the PIT or (CSL) Test

CSL and PIT will be evaluated by the engineer. If the engineer determines that CSL or the PIT testing indicates significant anomalies or defects, the engineer will direct the contractor to core the shaft(s) at the location(s) of the defect or anomaly. The coring shall be a minimum of NX sized double tube core barrel. The engineer will determine the number of cores, length(s), location(s), and testing methodology. If the coring or core sample testing results confirm the presence of significant anomalies or defects, the drilled shaft will be determined to be unacceptable and rejected by the engineer. Upon rejection of the shaft(s), submit a remedial action plan to the engineer for correcting the rejected work.

The remedial action plan shall include detailed shaft repair or replacement procedures if necessary and will be subject to acceptance by the engineer. Any modifications to the drilled shaft, load transfer mechanisms, and elements affected by the proposed remedial actions will require calculations and working drawings, and shall be made and stamped by a professional engineer, registered in the state of Wisconsin.

In the event that the engineer directs the contractor to core through the concrete and the coring and associated core sample tests confirm the presence of anomalies or defects, the cost of coring, hole closure, core sample tests, and all labor and materials to perform the accepted remedial actions shall be provided at no additional cost to the department and with no extension of the contract time originally granted.

In the event that the engineer directs the contractor to core through the concrete and the core or core sample tests do not confirm the presence of anomalies or defects, the cost of the coring, hole closure and associated testing shall be borne by the department.

Frequent defects as determined by the engineer will result in a re-evaluation of the contractor's installation procedure and, depending on the frequency and type of defect, may direct the contractor to change or modify his procedure

D Measurement

The number of linear feet of Wall Secant Pile (diameter) of individual shafts acceptably completed will be based on the plan quantity (length) without measurement according to the Pay Plan Quantity article. Longer shafts, larger shaft diameters, additional excavation, and additional concrete placed beyond the limits of the plan dimensions will not be measured for payment unless authorized and agreed to in advance of placement by the engineer.

E Payment

The department will pay for plan quantities or revised plan quantities if agreed to in advance of placement by the engineer according to the Pay Plan Quantity article, at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4450	Wall Secant Pile 47.24-Inch	LF

Payment is full compensation for furnishing, installing, and removing full depth temporary casing, guide walls, placing and removing temporary working surfaces, drilling fluids, documentation, clearing or removal of surface obstructions, clearing or removal of known man-made obstructions; removal of concrete due to oversizing, blowouts or protrusions from the face of the shafts; drilling the shafts, handling and disposal of the excavated, augered and cored soils, and any drilling fluids; positioning steel, wheel type spacers and boots; furnishing and placing the concrete for the drilled shafts to the dimensions and elevations as shown on the plans, and installing and closing the crosshole logging tubes; required wall repairs to address leaks.

Reinforcement bars are measured and paid under the bid item Bar Steel Reinforcement HS Bridges.

Removal of unknown man-made subsurface obstructions for Wall Secant Pile 47.24-Inch will be measured and paid for separately under the bid item, Obstructions Wall Secant Pile, included in the contract.

333. Drilled Foundation Shaft 78.74-Inch, Item SPV.0090.4455; Drilled Foundation Shaft 98.43-Inch, Item SPV.0090.4460.

A Description

This special provision describes installing drilled foundation shafts for bridge foundations as shown on the plans.

A.1 Qualifications of the Contractor

A contractor shall be on the Wisconsin Department of Transportation state-wide list of pre-certified drilled shaft contractors. The following listed pre-certified drilling contractors or entities are currently on this list and must perform the work associated with the installation of drilled shafts as described in these special provisions:

Case Foundation Company
1325 West Lake Street
PO Box 40
Roselle, Il 60172
Contact: Eric Risberg
Phone: (630) 529-2911
E-mail: ejrisberg@casefoundation.com

Kiewit Infrastructure Company
302 South 36th Street, Suite 400
Omaha, NE 68131
Contact: Robert Culver
Phone: (402) 346-8535
Email: rob.culver@kiewit.com

Malcolm Drilling Company, Inc.
791 S Gladiola Street
Salt Lake City, UT 84104
Contact: Scott Chambers
Phone: (801) 972-1126
E-mail: schambers@malcolmdrilling.com

Walsh Construction Company
929 West Adams Street
Chicago, Il 60607
Contact: Steve Kehle
Phone: (312) 563-5400
Email: sgkehle@walshgroup.com.

Contractors or entities not listed and not pre-certified are not permitted to perform the work.

Submit the name(s) of pre-certified drilling contractor(s) that will perform installation of drilled foundation shafts on the project to the department within 24 hours after the bid opening. Submit to:

Scott Lawry / Chief Proposal Management Engineer
Wisconsin Department of Transportation
Division of Transportation System Development
Phone: (608) 266-3721
Fax: (608) 266-8459
Email: scott.lawry@dot.wi.gov

The drilling contractor's assigned personnel must match, by position, individuals shown in the contractor's precertification submittal. Submit the names and position of the drilling contractor's staff at the preconstruction meeting or 14 calendar days prior to the start of the drilled shaft construction, whichever date is earlier. Do not start any drilled shaft work until the engineer confirms that the contractor's proposed staff conforms to the contractor's accepted precertification submittal. The engineer may suspend the drilled shaft work if the contractor staffs the project with personnel not identified in the contractor's accepted precertification submittal without prior acceptance from the engineer for staff substitutions. If work is suspended due to the substitution of unqualified personnel, an adjustment in contract time resulting from the suspension of work will not be permitted.

A.2 Staff Substitution

The drilling contractor is expected to staff the project with personnel identified in the drilling contractor's accepted precertification submittal. Request in writing to the engineer to provide substitute staff not identified in the contractor's accepted precertification submittal. Substitute staff must be equivalently or better qualified as determined by the engineer. Provide the experience and qualification information for the proposed substitute staff as was originally provided for the staff in the contractor's precertification submittal. The contractor will not be permitted to start or continue any drilled foundation shaft work with substitute staff until the engineer confirms their qualifications and accepts the proposed substitute staff to work on the project.

B Materials

B.1 General

Concrete, drilling fluid, reinforcement and formwork shall be in accordance to the requirements of QMP Drilled Shafts, standard specifications, as shown on the plans, and as hereinafter provided.

In the event that the provisions of other specification clauses cause ambiguity or conflict with these special provisions, these special provisions shall take precedence unless otherwise accepted by the engineer.

B.2 Equipment

Equipment used for excavation, drilling, and cleaning operations shall utilize a full depth temporary casing, installed using a hydraulic oscillator, and an overhead rotary drill rig to excavate inside the casing. The oscillator shall have adequate capacity; including power, torque, and down thrust to install and extract the full depth temporary casing to a depth equal to the maximum depth of the drilled shafts shown in the plans plus 15 feet, or plus 20 percent of the maximum depth shown in the plans, whichever is greater. The overhead rotary drill rig shall have adequate capacity, including power, torque and down thrust to excavate a hole within the casing to a depth equal to the maximum depth of the drilled shafts shown in the plans plus 15 feet, or plus 20 percent of the maximum depth shown in the plans, whichever is greater. Anticipate and make available at the job site all equipment necessary and essential to penetrate soft and hard soils, as well as cobbles and boulders and unidentified man-made obstructions, during the construction of the drilled shafts.

The oscillator must be capable of installing and extracting the full depth temporary casing by means of rotational or oscillatory motion and advancing the casing a minimum of 5 feet ahead of the excavation inside the casing until the shaft tip elevation is reached. No excavation ahead of the casing is permitted without the engineer's approval. Installation or removal of temporary casing by impact driving or vibration is not permitted. Advancing and installing the temporary casing by means of excavation ahead of the casing is not permitted.

Where hard soils, or other material including natural or man-made obstructions are encountered and cannot be drilled using conventional earth or rock augers, drilling buckets, and/or over reaming tools, provide drilling equipment including but not limited to rock core barrels, rock tools, down the hole hammer, chisels, air tools, or any other equipment necessary to advance the drilled shaft excavation to the depth and size as shown on the plans.

When applicable, or required by the engineer, provide equipment that produces a stable slurry suspension, mechanical agitation, and a pipeline or other safe methods of transporting the slurry to the drilled shaft.

B.3 Temporary Casing

Temporary casing shall be steel; rigid, smooth, clean, watertight, and of ample strength to withstand both handling and installation stresses and the pressure of both concrete and the surrounding earth materials. Temporary casing must be of sufficient length to provide temporary casing the full length of excavation for all drilled shafts. Segmented casing, if used, must be segmented using flush bolted, casing joints. Telescopic casing is not permitted. The diameter of casing shall not be less than the specified size of the drilled shaft. All casing diameters shown on the plans refer to outside diameter, O.D. dimensions.

B.4 Temporary Working Surface

Fill material, if required, to create a working surface for construction can be any suitable material approved by the engineer containing no logs, stumps, brush, perishables, or other materials such as stone or broken concrete that may affect the drilling of the shafts. Material that will remain permanently shall consist only of appropriate embankment fill when placed in association with a roadway, conforming to the requirements of standard spec 207.2.

B.5 Reinforcing Steel and Spacers

Deformed reinforcing bars shall comply with the size, dimension, spacing, and details shown on the plans. In addition, they shall conform to AASHTO M31, Grade 60, and all the pertinent requirements of standard spec 505. Non-corrosive wheel type spacers and boots shall be used to properly position the reinforcing steel. All reinforcing steel shall be 100% wire tied between the vertical reinforcement and ties.

B.6 Crosshole Sonic Logging (CSL) Tubes

Access tubes for CSL testing shall be 2 inches I.D. schedule 40 steel pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S. Pipes shall have a round, regular internal diameter, free of defects or obstructions; including any defect at the pipe joints, to permit the free unobstructed passage of source and receiver probes. Each tube or steel pipe shall be fitted with a watertight shoe onto the bottom and a removable cap at the top. Both, the shoe and cap shall be watertight and free from corrosion. The internal and external faces of the CSL tubes shall be clean to ensure passage of the probes and produce a good bond with the concrete.

C Construction

C.1 Drilled Foundation Shaft Installation Plan

C.1.1 General

Prepare and submit a Drilled Foundation Shaft Installation Plan at the preconstruction meeting or at least 14 calendar days prior to beginning drilled shaft construction, whichever date is earlier. Submit the Drilled Foundation Shaft Installation Plan to the engineer for review. The engineer will accept the plan as submitted or return the plan with requested revisions. The engineer's initial acceptance of the submitted plan is considered preliminary with final acceptance pending the successful completion and acceptance of the Trial Drilled Foundation Shaft included in the contract. Do not start any work on production drilled foundation shaft installations until after the successful installation of the Trial Drilled Foundation Shaft and the engineer provides final acceptance the Drilled

Foundation Shaft Installation Plan. Acceptance of the installation plan does not relieve the contractor of responsibility for successful completion of the drilled foundation shafts.

C.1.2 Subsurface Conditions

The subsurface conditions vary across the project site and are not necessarily the same along the length of structures containing drilled shafts. Anticipate the possibility of encountering loose permeable sand or gravel seams of substantial thickness interlaced randomly within glacial clay and till deposits, saturated soils and ground water, isolated cobbles or boulders, and nestled cobbles and boulders while excavating and installing secant pile walls or drilled shafts along the length of structures within this contract.

The contractor is strongly advised to obtain and review the Geotechnical Exploration and Foundation Evaluation Report for the bridge structure for which the drilled foundation shafts are being constructed. See article "Geotechnical Investigation Information" in these special provisions for information on obtaining geotechnical reports.

C.1.3 Submittals

The submitted Drilled Shaft Installation Plan shall include the following:

a. **Job Site Visit**. Acknowledge that the job site was visited to verify the site conditions with regard to entrance, access, overhead lines, subsurface features, clearing and grubbing, permitting, and collecting all information necessary to plan and execute the installation of the drilled shafts.
b. **Plan to Protect Existing Structures**. Outline the steps to be taken during drilled shaft installation to protect adjacent or nearby structures and utilties.
c. **Details of Environmental Control Procedures**. Provide plan to prevent loss of slurry or concrete into waterways, project areas, or protected areas. Detail method to ensure the compliance with state and federal environmental regulations during drilled shaft construction.
d. **List of Proposed Equipment**. Include details of proposed templates; number and sizes of cranes; number and size of oscillators; number and sizes of drills, include rotary torque, crowd force drills, and maximum drilling depth; diameter, length, and reach of augers, bailing buckets, guide walls, templates, and roller bits; cleaning equipment including cleaning buckets, submersible pumps, or air-lifted pumps; size of de-sanding equipment and slurry pumps; soil/rock-coring sampling equipment; inspecting drilled shaft apparatus; length and diameter of tremie or size of concrete pumps; size, length, and thickness of casings; over reaming equipment; and all relevant equipment necessary to complete the drilled shaft installation. Acceptance of the installation plan by the department does not relieve the contractor responsibility to provide other equipment, if necessary, to achieve satisfactory shaft installations meeting the requirements of this special provision.
e. **Details of Sequence of Drilled Shaft Installation and Time for Construction Operations**. Include a layout of the drilled shaft installation sequence. Provide a sequential list of installation steps and a time table of operations for installing full depth temporary casing, sealing casing, excavation and/or drilling time, drilled shaft cleaning, rock coring, drilled shaft inspection, concrete placement. Consider the effect of construction operations of one drilled shaft onto the adjacent drilled

shaft(s) and utilities and avoid construction conflicts that will affect the quality or integrity of the completed work. Indicate when and what construction sequence modifications shall be performed under atypical situations, i.e, weekend or holiday shutdowns, unanticipated shutdowns due to equipment issues, etc.

f. **Proposed Drilled Shaft Installation Procedure(s)**. Provide details of the proposed shaft installation procedures, including coring or drilling boulders, rock, obstructions or steep sloping surfaces, when required, and meeting the minimum installation requirements set forth in subsection C.3. Method for identification of the competent or bearing material before finalizing the excavation. Method for monitoring verticality of the drilled shaft walls during excavation, and details of proposed corrective measures to be implemented for shafts out of tolerance. Details of the methods and means of preventing displacement of the casing and/or drilled shaft during installation.
g. **Details of Slurry Operations.** This is required if slurry is used to stabilize the bottom of the excavation within the temporary casing. Include slurry type, methods to mix, circulation, de-sanding, and test the slurry to comply with these special provisions.
h. **Inspection and Cleaning**. Methods to clean and inspect the drilled shaft excavation prior to reinforcement placement.
i. **Crosshole Sonic Logging (CSL).** Method to install and secure the CSL pipes to the reinforcing cage or steel core, along with the proposed selection of pipe and size.
j. **Details of Reinforcement Steel Placement During Construction**. Include methods to ensure cage centering and cover; proper cage orientation, cage integrity while lifted during placement, number of cranes, number of lift points, and number of spreader bars; number and location of bottom and side spacers; cage support; and tie downs during concrete placement.
k. **Concrete Placement Plan**. The purpose of the Concrete Placement Plan is to ensure that a sufficient quantity of concrete is at the job site or in transit to the job site so that the entire pour can be done without delay. Include location of the concrete plant, number of trucks, estimated delivery times, estimated time between trucks, and number of trucks at the site before placement begins. Indicate the use of tremie or concrete pump lines and details of the seal to be used at the bottom end of the tremie or concrete pump line. Breakdowns of concrete plants, trucks, or traffic problems shall be considered under this Concrete Placement Plan. The contractor shall be aware of, and account for, batch, travel, and concrete placement times. Include an estimate of the concrete placement time per drilled shaft. When applicable, detail excavation to grade and finishing of the drilled shafts.
l. **Casing Removal**. Include the details and means by which the contractor intends to remove full depth temporary casings and provide information about staged temporary casing removal when applicable.
m. **Methods of Handling and Disposal of Spoil Excavation, Waste Slurry, Waste Concrete, and Drilled Shaft Cutoffs**. Present sufficient details to the engineer to evaluate the adequacy and compliance of the contractor's methods of disposal with the standard specifications, including all related environmental permits and local regulations.

n. **Other Information** requested on the plans or by the engineer.

C.1.4 Acceptance

The department will evaluate the Drilled Foundation Shaft Installation Plan for conformance with the requirements of these special provisions. Within 14 calendar days after receipt of the Drilled Foundation Shaft Installation Plan, the engineer will notify the contractor of the preliminary acceptance of the plan, or if additional information and/or changes are required. Any unacceptable part of the Installation Plan will require resubmission. The contractor must resubmit the Drilled Foundation Shaft Installation Plan for evaluation and review with the necessary changes or additional information provided. The engineer will provide a written notice of preliminary acceptance or rejection of contractor's resubmitted Drilled Foundation Shaft Installation Plan within 14 calendar days after its receipt. The engineer will provide final acceptance of the Drilled Foundation Shaft Installation Plan after the successful completion of the Trial Drilled Foundation Shaft and satisfactory drilled foundation shaft installation performance is demonstrated in the field.

After assessment or reassessment of the Drilled Foundation Shaft Installation Plan has been made and the engineer has granted preliminary acceptance, no changes to the plan can be made without written consent of the engineer.

C.2 Trial Drilled Foundation Shaft

After the Drilled Foundation Shaft Installation Plan has been preliminarily accepted, construct a non-production trial drilled foundation shaft using the same crews and equipment that will be performing the drilled foundation production work. Construct in accordance to the Trial Drilled Foundation Shaft special provision and adhere to and demonstrate the adequacy of the accepted Drilled Foundation Shaft Installation Plan.

Construction of the Trial Drilled Foundation Shaft will be used to determine if the contractor's methods, equipment, personnel, and proposed procedures are effective to produce stable drilled shaft excavations and drilled foundation shafts that meet the requirements of these special provisions. CSL tests may be performed by the engineer, as part of the evaluation of the trial shaft. With approval of the engineer, revise construction methods and equipment as necessary during this stage or at any time during the installation of production shafts to satisfactorily complete the drilled foundation shafts in accordance to these special provisions.

In the event the contractor fails to demonstrate the adequacy of the drilled foundation shaft installation procedure(s) or equipment during construction of the Trial Drilled Foundation Shaft, the engineer will require appropriate modifications as may be necessary to produce acceptable results. Comply to satisfactorily demonstrate the adequacy of the proposed method(s) or equipment, or construct additional trial drilled foundation shafts as indicated by the engineer at no additional cost to the department.

C.3 Drilled Shaft Installation

C.3.1 General

Carry out the work in accordance to the accepted Drilled Foundation Shaft Installation Plan and as demonstrated during installation of the Trial Drilled Foundation Shaft. The resulting installation plan shall include length of full depth temporary casing, details of the constituent materials of any drilling fluid or means used for stabilization of the bottom of the excavation, the method of inspection, details of the concrete design mix, concreting method, the anticipated time to complete one shaft, and the pattern of construction.

Ensure that damage does not occur to the completed shafts as a result of work on adjacent shafts. Submit to the engineer a drilled shaft installation sequence. The proposed sequence and timing of shaft installation shall be such that the installation work will not cause any damage to adjacent shafts. The shaft installation shall not commence until acceptance of the engineer has been obtained.

C.3.2 Temporary Working Surface

Use a temporary working surface to provide a level surface at the top of shafts for drilling where needed.

C.3.3 Forcible Correction

Where shafts have not been positioned within the specified limits no method of forcible correction will be permitted.

C.3.4 Records

Keep a work record of all shafts installed. Give a copy of each day's record to the engineer within 24 hours of that day's work being completed. The engineer will review and agree to the daily record form format before drilled shaft work commences. Incorporate any comments by the engineer into the record form. Note all unexpected drilling or installation conditions in the records.

C.3.5 Methods of Drilled Shaft Installation

C.3.5.1 General

The temporary casing installation method and concrete placement in the wet using a tremie pipe shall be used to produce sound and durable drilled shafts free of defects. When a particular installation method is required in the special provisions, only that method of construction shall be used. If no particular method is specified for use, select and use one of the methods of construction as determined by the site conditions and needed to properly accomplish the work. Do not use the permanent casing method unless authorized by the engineer. Submit to the engineer for acceptance his selected method of construction in the Drilled Shaft Installation Plan described in these special provisions.

Full length temporary casing with the use of water or slurry inside the temporary casing, is required for the installation of all drilled shafts on the project. The use of permanent casing method will not be permitted unless authorized by the engineer. The use of slurry without casing is not permitted. Full depth temporary casing shall be installed using overhead rotary drive equipment or by using hydraulic oscillating equipment specifically intended

for temporary casing installation and extraction. Installation of full depth temporary casing by means of driving or vibrating is not permitted. Advancing and installing casing by means of excavation ahead of the casing is not permitted. During temporary casing installation and shaft excavation, the tip of the temporary casing shall be advanced a minimum of 5 feet ahead of the tip of the excavation, until the bottom of the excavation is reached.

After the temporary casing is in place, excavate inside the casing, while keeping the temporary casing full of water or slurry as necessary to stabilize the bottom of the excavation within the casing. Excavate to the planned shaft tip elevation using the wet excavation techniques described below. Clean the bottom of the excavation. Before extracting the temporary casing, ensure that the level of fresh concrete inside the casing is at such level that the pressure of its hydrostatic head displaces up and out the fluid trapped in the annular space between the casing and the drilled shaft wall.

C.3.5.2 Dry Installation Method
The dry method of shaft installation is not permitted.

C.3.5.3 Temporary Casing Installation Method
The temporary casing method of shaft installation consists of supporting the shaft excavation by means of full depth temporary casing that is advanced ahead of the excavation until the drilled shaft tip elevation is reached. Excavate, remove, and clean all accumulated loose material from within the cased excavation before placing the reinforcement cage and the shaft concrete in the wet excavation. Do not place concrete into the wet excavation using free fall. Concrete must be placed under water in wet excavation using proper tremie procedures to direct the concrete under the water inside the shaft excavation and displace the water.

C.3.5.4 Wet Installation Method
The wet installation method consists of drilled shaft installation by means of full depth temporary casing in conjunction with the use of slurry, drilling fluid, or water to maintain stability against heave and blow-in in the bottom of the excavation. Use the wet installation method for all drilled foundation shafts in the contract. When using the wet method below the groundwater table, all drilled shaft operations shall be accomplished while maintaining a positive head of fluid of sufficient depth above the water table to avoid heaving or blow-in of the bottom of the excavation.

C.3.5.5 Permanent Casing Method
Do not use the permanent casing method.

C.3.6 Excavations
C.3.6.1 General
Excavations required for the drilled foundation shaft s shall be performed through whatever materials are encountered to the dimensions and elevations shown in the plans, or as directed by the engineer. The excavation and installation method shall be suitable for the intended results and materials encountered. Blasting is not permitted.

Maintain a construction log during the drilled foundation shaft excavation. The construction log will include information such as ground elevation, ground water elevation, sequence number, method of installation, machines and tools employed, drilling fluids employed, drilling times, excavated materials and their particular elevations, soil samples and their particular elevations, and all other information relevant to the excavation process that will assist the engineer in evaluating the foundation. Information shall also include proposed methods for disposal of excavated material and slurry in accordance to state and local environmental regulations, codes and ordinances, the standard specifications, or as directed by the engineer.

C.3.6.2 Protection of Existing Structures

Take all reasonable precautions to prevent damage to existing structures and utilities. These measures shall include, but are not limited to, subsidence control during installation of temporary casings or excavation inside temporary casings.

Where drilled foundation shaft s are to be installed in conjunction with embankment placement, the drilled foundation shaft s shall be constructed after placement of the fill, unless otherwise shown in the plans, or accepted by the engineer. If fill is required to be placed after completion of the drilled shafts, the footing cap shall be done, as closely as possible, after the fill is in placed and compacted to final grade leaving only the space necessary for the construction of the cap.

C.3.6.3 Drilled Shaft Excavation

Provide the necessary equipment to remove and dispose of all materials encountered in the drilled shaft excavation to the dimension and elevation shown on the plans, or as directed by the engineer. Contractor's excavation equipment may include but is not limited to earth augers and rotary drills designed to work within full depth temporary casing. Unless otherwise shown on the plans, the drilled shaft excavations shall be vertical bored holes extending from the ground surface down to design tip elevation.

C.3.6.4 Obstructions

Obstructions are defined as man-made objects that when encountered, stop or significantly impede downward progress of the temporary casing installation or excavation to less than 12-inches for 60 minutes or longer under normal applied thrust and torque. Obstructions include man-made objects and may include, but are not limited to old concrete foundations, piling, abandoned utilities or buried pavements. Obstructions are further classified as "known obstructions" which are identified on the plans, and "unknown obstructions" that may be encountered but are not identified on the plans.

Employ special tools and/or procedures as necessary when obstructions are encountered and the contractor cannot advance the excavation more than 12-inches in 60 minutes using conventional rock augers fitted with teeth, drilling buckets, or under reaming tools operating at normal power, torque, and down thrust. Special procedures and tools that may be required include, but are not limited to; chisels, breakers, core barrels, air hammer tools, and hand excavation. Other methods for obstruction removal such as temporary casing or

hole diameter increase can be employed to aid in the removal if acceptable to the engineer. Blasting is not permitted.

Natural deposits, including boulders, cobbles, nested cobbles and other deposits may be encountered that impede the installation and advancement of the temporary casing and excavation to less than 12-inches for 60 minutes or longer as noted above for obstructions. Natural deposits, regardless of makeup, depth, configuration, and consistency are not classified as obstructions as defined in this special provision or the special provision Obstructions Drilled Foundation Shaft included in the contract.

C.3.6.5 Lost Tools

Drilling tools that are lost in the excavation shall not be considered obstructions and shall be promptly removed. All costs due to removal of lost tools shall be borne by the contractor including costs associated with hole degradation during removal operations or time while the hole remains open.

C.3.6.6 Inspections and Cleanliness of Excavation

Provide the details of drilled shaft inspection and cleanliness within the Drilled Foundation Shaft Installation Plan, required by subsection C.1.3 of this specification. Provide equipment and tools for checking the dimensions and alignment of each drilled shaft excavation, and coordinate schedules for inspection of the excavation with the engineer. Determine dimensions, alignment, and final depth of the drilled shafts after final cleaning. When applicable, provide safe access and egress to the engineer for inspection of the walls and bottom of the drilled shaft excavation prior to placement of the rebar cage or steel core section and concrete. After the drilled shaft excavation has been prepared for inspection, notify the engineer. The cleanliness and the bearing surface of the drilled shafts will be evaluated and accepted by the engineer. Unless the engineer specifies otherwise, the contractor's cleaning operation shall be considered sufficient when no more that 50 percent of the bottom area of each shaft has less than 1/2-inch of sediment or debris at the time of hole acceptance just prior to steel positioning and concrete placement. The maximum depth of sediment or any debris at any location on the bottom of the shaft shall not exceed 1 1/2-inch at the time of concrete placement.

C.3.6.7 Safety

Do not permit any worker to enter the drilled foundation shaft excavation for any reason unless a suitable casing has been installed, the water level has been lowered and stabilized below the level to be occupied, and suitable safety equipment and procedures have been provided to the personnel entering the excavation which includes OSHA certification for confined-entry-space.

C.3.6.8 Record Information

Provide to the department the drilled shaft excavation records and report any unusual observation to the engineer within 8 hours of discovery. Submit a draft of this form for each completed drilled shaft within 24 hours of shaft completion, and submit the final form within 2 weeks. Submit relevant information on a daily basis, or more frequently when variations occur, or as otherwise required by the engineer.

Report the drilled shaft construction progress in accordance to "Records and Forms" Drilled Shafts: Publication No. FHWA – GEC 010, Section 19.5 and Appendix F, pages F-1 through F-16.

C.3.7 Placement of Reinforcing Steel Cage

Prior to placement of the reinforcing steel and concrete, if slurry fluid was employed during the installation of the drilled shaft, test the slurry for compliance with this specification as described in the QMP Drilled Shafts special provision. Slurry Tests shall be performed along the shaft and at the bottom of the shaft. Adjust the slurry properties as necessary to meet the specifications.

Prior to placement of the reinforcing steel and concrete, ensure that the C.3.6.6 cleanliness requirements are met.

Concrete or non-corrosive spacers shall be used at sufficient intervals not exceeding 10 feet along the reinforcement cage or the steel core. A minimum of 4 spacers shall be spaced evenly around the circumference of any shaft with a maximum space around the shaft circumference of 30 inches between any spacer (i.e. at any given level a 4-foot diameter shaft shall have 4 spacers). The first spacers shall be placed 1.5 feet from the bottom of the shaft with successive spacers at maximum intervals of 10 feet along the shaft. Spacers shall be of an appropriate diameter wheel to provide minimum clearance shown on the plans between the shaft excavation walls and the steel reinforcement.

C.3.8 Concrete Placement

C.3.8.1 General

Place concrete continuously once concrete placement is started. No intermediate construction or cold joints are permitted within a single drilled foundation shaft.

Test the concrete delivered to the job site for compliance with the QMP Drill Shafts special provisions, the standard specifications and these special provisions.

C.3.8.2 Concrete Placement Time

Place concrete within three hours after excavation inspection and approval unless otherwise directed by the engineer. If the concrete is not placed within this time frame, the excavation must be re-inspected and accepted by the engineer prior to concrete placement.

C.3.8.3 Concrete Placement by Free Fall

Concrete placement within drilled shafts by free fall is not permitted.

C.3.8.4 Concrete Placement by Tremie Pipes

Use tremie pipes to place the concrete inside the excavation. Keep the discharge end of the tremie a minimum of 7-feet below the level of the fresh concrete already placed inside the excavation to maintain a seal. The concrete shall flow into position by pressure through a steel tremie with a minimum diameter of 10-inches. Seal the bottom of the tremie using one way flap valve, before it is lowered into the wet excavation. If water/slurry enters the

tremie pipe after concrete pouring has started, the tremie must be withdrawn, cleaned, resealed, and pouring restarted. If for some reason, the tremie is raised out of the fluid concrete or the concrete inside the drilled shaft drops down contaminating the tremie, completely remove and clean the tremie, then replace the seal at the bottom of the tremie, and lower the tremie back as far below as possible into the already placed concrete.

C.3.8.5 Concrete Placement by Concrete Pumps

Concrete pumps and concrete lines can be used to place concrete in drilled shafts rapidly or to deliver the concrete from a distant location. However, due to the need to disassemble the pump line to allow the removal of casing sections and potential air pockets, disruption in concrete flow, the concrete pump placement directly within the shaft is not permitted on this project. The pump must discharge the concrete into a minimum 10-inch diameter steel tremie with a bottom one way flap valve.

All pump lines and connections shall be watertight and must guide the concrete to the discharge point at the center of the rebar cage or steel core and drilled shaft excavation. The pump line may be flexible; however, inside the shaft use a minimum 10-inch diameter steel tremie pipe that can deliver the concrete in an uninterrupted manner. Keep the bottom of the tremie or discharge orifice 7-feet below the surface of fluid concrete already placed to avoid sudden jumping of the pump line out of the excavation. Concreting shall continue until over pouring is evident at the top of the drilled shaft and until dark gray concrete (acceptable concrete) can be distinguished from the drilling fluid.

C.3.8.6 Casting Level

Over pour concrete above the top of shaft cut-off level to ensure that all concrete at and below cut-off level is homogeneous and free of laitance and deleterious materials.

C.3.9 Construction Tolerances for Individual Shafts

Drilled foundation shaft excavations or completed drilled foundation shaft s constructed out of the tolerance will not be accepted. The contractor is responsible for correcting to the satisfaction of the engineer all unacceptable work. Materials, construction, work, engineering analysis, and redesign necessary to complete corrections to out-of-tolerance excavations or completed drilled shafts shall be furnished to the department without either cost or time extension for the project. Comply with the following construction tolerances:

a. The final, as constructed position of the drilled shaft shall be within a maximum of 2 inches in any direction from the theoretical position shown on the plans, unless otherwise permitted by the engineer prior to construction.
b. The vertical alignment of the drilled shaft excavation shall not vary by more than 1/16 inch per foot from plumb vertical.
c. The diameter of the installed drilled shaft shall not be less than the diameter of the drilled shaft shown on the plans. Any conflicts due to a casing that is greater in diameter than the plan shaft diameter shall be remedied by the contractor. No additional compensation or schedule time shall be granted to the contractor for resolving any conflicts due to oversized casings. Employ equipment and methods of excavation to complete the drilled shaft excavation to a planar bottom, and the cutting edges of the equipment used during the excavation shall be normal to

equipment's vertical axis within a tolerance of 3/8-inch per foot of diameter. The bottom of the drilled shaft excavation shall be normal to the axis of the drilled shaft within ¾-inch per foot of drilled shaft diameter.

d. Tolerances outlined in sections a. to c. herein shall be checked and finally met by the contractor prior to placement of the reinforced rebar cage or steel core inside the shaft hole.
e. After the concrete is poured, the top elevation of the installed drilled shaft shall be within 1-inch of the top elevation of the corresponding drilled shaft on the plans, and the top of the reinforcing steel cage shall be within the positional tolerance shown on the plans. The center of the reinforcing cage shall be the center of the drilled shaft.

C.3.10 Non Destructive Testing Program

C.3.10.1 Shaft Integrity Testing (PIT)

The Pile Integrity Tester performs low strain integrity testing, alternatively called Sonic Testing, Pulse Echo, or Transient Response. The PIT can detect the presence and location of potentially dangerous defects such as cracks, necking, soil inclusions or voids and can determine shaft length. The equipment and technique are well established, and specified by ASTM D5882.

Prior to beginning the PIT test, assure that the concrete top is accessible and cleaned. The test(s) will be performed by the engineer. The engineer will evaluate and analyze the PIT test results within five business days and provide the contractor with a response regarding the acceptability of the drilled shaft tested. The test shall be conducted on shafts that are at least five days old so that the concrete has attained minimum compressive strength necessary to perform the test.

C.3.10.2 Crosshole Sonic Logging Test

C.3.10.2.1 General

Crosshole Sonic Logging, (CSL), is a nondestructive testing (NDT) method that measures the time for an ultrasonic pulse to travel from a signal source inside an access tube to a receiver inside another access tube and evaluates the integrity of drilled shafts.

Install access tubes intended for Crosshole Sonic Logging CSL testing. The test(s) will be performed by the engineer. All CSL testing will be completed within ten calendar days of concrete placement.

Prior to beginning the CSL test, ensure that the test probes can pass through and down the tubes to the bottom of every installed tube. If a tube is obstructed, the contractor, at no additional cost to the department, must core a hole within the drilled shaft and near the obstructed tube to the depth as directed by the engineer. The core shall be large enough to accommodate the probe through its full length.

The engineer will evaluate and analyze the CSL test results within five business days of their receipt and provide a response regarding the acceptability of the drilled shaft tested. The test shall be performed in accordance to ASTM D6760.

C.3.10.2.2 Installation Requirements

Drilled shafts must be fitted with CSL test tubes to evaluate their integrity as shown on the plans.

Install the access tubes or pipes as nearly parallel and far as possible from the longitudinal bars. The number of tubes to be installed per each drilled shaft diameter is as indicated in the table below:

Drilled Shaft Diameter	Number of CSL Tubes	Tube Spacing
78.74-inches	7 minimum	As shown in plans
98.43-inches	9 minimum	As shown in plans

Securely attach the tubes to the interior of the reinforcement cage with a minimum concrete cover of three inches. The tubes may be attached to exterior of the cage when accepted by the engineer provided the minimum cover requirement of 3-inches over the tubes shall be maintained. In all cases, the tubes shall be as near to vertical and parallel as possible.

Extend the tubes from the bottom of the drilled shaft to at least 3-feet above the top of the drilled shaft, or 2-feet above the ground surface for shafts with cut-off below the ground surface. The tubes must be watertight and capped to prevent concrete or debris from entering during manipulation of the cage and concreting. Care must be taken during lifting and lowering the steel reinforcement so as not to damage the tubes. Fill the CSL tubes with potable water prior to concrete placement. For production shafts and upon completion of the CSL tests, remove all the water from the access tubes or drilled holes and fill them with an approved grout.

C.3.11 Acceptance for Constructed Drilled Shafts

C.3.11.1 General

Any drilled foundation shaft s that are not constructed and installed in accordance to these special provisions will be rejected by the engineer. Rejected shafts shall be replaced or rectified by the contractor using methods and procedures subject to the acceptance of the engineer. If required to rectify rejected shafts, shaft replacement, shaft repair, or the cost of constructing additional shafts, will be at no additional cost to the department and no additional time will be added to the contract

In the event that a shaft or shafts are rejected, work on remaining drilled shafts in the contract cannot continue until the contractor re-visits and re-submits a revised drilled shaft installation plan and the revised plan is accepted by the engineer. The revised plan must address any construction issues that resulted in or contributed to the reason(s) for which the deficient shaft(s) were rejected. No additional time will be added to the contract for the time required to revise and accept the revised drilled shaft installation plan.

C.3.11.2 Based on Specifications

The department will only accept drilled foundation shafts that conform to these special provisions. Drilled foundation shafts and related work constructed in any manner that disregards any specified requirement will not be accepted. This includes:

a. Drilled foundation shaft excavations constructed out-of-tolerance, as specified in this specification. When repair to an out-of-tolerance shaft is possible as determined by the engineer, fix the drilled shaft to meet the tolerances before the contractor is permitted to proceed further with any drilled shaft construction. All repairs must be acceptable to the engineer before the contractor may resume the drilled shaft work.
b. Excavation of a drilled foundation shaft with slurry not conforming to the QMP Drilled Shafts special provision.
c. Drilled foundation shafts exhibiting cuttings from slurry at the drilled shaft bottom; showing soft, incomplete, or unclean bottoms; or presenting side sloughing and sedimentation at the bottom.
d. Drilled foundation shaft s with honeycomb intrusions or concrete in which the fines have been washed out or water channels in concrete.
e. Horizontal discontinuity or necking in the drilled foundation shaft concrete.
f. Quarter-moon-shaped soil intrusions on the sides of a drilled foundation shaft.
g. Folded-in debris inside a drilled foundation shaft.
h. Drilled foundation shaft s for which the mix design has been altered without the acceptance of the engineer, including the unauthorized addition of water to a mix design to bring it to a certain slump.
i. Drilled foundation shaft s constructed in a manner where concrete placement has failed to meet the required time requirements, placement tolerances, or the methods of installation did not have the engineer's acceptance.
j. Drilled foundation shaft s constructed with concrete not meeting the minimum 28-day compressive strength requirement shown on the plans.

C.3.11.3 Based on the PIT or (CSL) Test

CSL and PIT will be evaluated by the engineer. If the engineer determines that CSL or the PIT testing indicates significant anomalies or defects, the engineer will direct the contractor to core the shaft(s) at the location(s) of the defect or anomaly. The coring shall be a minimum of NX sized double tube core barrel. The engineer will determine the number of cores, length(s), location(s), and testing methodology. If the coring or core sample testing results confirm the presence of significant anomalies or defects, the drilled shaft will be determined to be unacceptable and rejected by the engineer. Upon rejection of the shaft(s), submit a remedial action plan to the engineer for correcting the rejected work. The remedial action plan shall include detailed shaft repair or replacement procedures if necessary and will be subject to acceptance by the engineer. Any modifications to the drilled shaft, load transfer mechanisms, and elements affected by the proposed remedial actions will require calculations and working drawings, and shall be made and stamped by a professional engineer, registered in the state of Wisconsin.

In the event that the engineer directs the contractor to core through the concrete and the coring and associated core sample tests confirm the presence of anomalies or defects, the cost of coring, hole closure, core sample tests, and all labor and materials to perform the accepted remedial actions shall be provided at no additional cost to the department and with no extension of the contract time originally granted.

In the event that the engineer directs the contractor to core through the concrete and the core or core sample tests do not confirm the presence of anomalies or defects, the cost of the coring, hole closure and associated testing shall be borne by the department.

Frequent defects as determined by the engineer will result in a re-evaluation of the contractor's installation procedure and, depending on the frequency and type of defect, the engineer may require the contractor to change or modify his procedure

D Measurement

The number of linear feet of Drilled Foundation Shaft (diameter) of individual shafts acceptably completed will be based on the plan quantity (length) without measurement. Longer shafts, larger shaft diameters, additional excavation, and additional concrete placed beyond the limits of the plan dimensions will not be measured for payment unless authorized and agreed to in advance of placement by the engineer.

E Payment

The department will pay for plan quantities or revised plan quantities if agreed to in advance of placement by the engineer, at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4455	Drilled Foundation Shaft 78.74-Inch	LF
SPV.0090.4460	Drilled Foundation Shaft 98.43-Inch	LF

Payment is full compensation for furnishing, installing, and removing full depth temporary casing, templates, placing and removing temporary working surfaces, drilling fluids, documentation, clearing or removal of surface obstructions, clearing or removal of known man-made or natural obstructions; drilling the shafts, handling and disposal of the excavated, augered and cored soils, and any drilling fluids; positioning steel, wheel type spacers and boots; furnishing and placing the concrete for the drilled Foundation Shafts to the dimensions and elevations as shown on the plans, and, installing and closing the crosshole logging tubes.

Reinforcement bars are measured and paid under the bid item Bar Steel Reinforcement HS Bridges.

Removal of unknown man-made subsurface obstructions for Drilled Foundation Shaft (diameter) will be measured and paid for separately under the bid item, Obstructions Drilled Foundation Shaft included in the contract.

334. Sheet Piling Interlock Waterproofing, Item SPV.0090.4470.

A Description

This work consists of furnishing and applying a waterproofing sealant to the sheet pile interlocks on retaining Wall R-40-548.

B Materials

Use a commercially available waterproofing sealant specifically intended to be used in the interlocks of steel sheet piles to make sheet pile interlock joints watertight. Use a cold applied, self-expanding waterproofing sealant that swells in the presence of moisture and is capable of producing a watertight seal in the interlock joints of adjacent sheet pile sections. Use a waterproofing sealant that is non-toxic and can be safely used in sheet pile interlocks installed below the ground water table.

Provide waterproofing sealant product literature, application instructions and material safety data sheets to the engineer.

C Construction

Apply the waterproofing sealant to the sheet pile interlocks prior to sheet pile installation in accordance to the waterproofing sealant manufacturer's installation instructions and recommendations.

D Measurement

The department will measure Sheet Piling Interlock Waterproofing by the linear foot measured along the length of sheet pile interlocks treated and waterproofed, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4470	Sheet Piling Interlock Waterproofing	LF

Payment is full compensation for supplying and applying the sheet piling interlock waterproofing product.

335. Prestressed Girder Type I 54W-Inch Special, Item SPV.0090.4480.

A Description

This special provision describes fabricating, furnishing, transporting and erecting prestressed concrete girders in accordance to the plans, the standard specifications, and as hereinafter provided.

This special provision applies to the exterior girders (girders 1 and 16) of the northernmost 132.5 foot span (span 3) of bridge B-40-862, carry S. 92nd street over IH-94 located in the City of Milwaukee. These two girders require forming beam ledges into the bottom flange

on the exterior face of the girders, and are thus delineated from the rest of the girders on the structure.

B Materials
Furnish materials in accordance to standard spec 503.2.

C Construction
Construction shall be in accordance to standard spec 503.3.

D Measurement
The department will measure the Prestressed Girder Type I 54W-Inch Special bid item by the linear foot, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.4480	Prestressed Girder Type I 54W-Inch Special	LF

Payment for the Prestressed Girder Type I 54W-Inch Special bid item is full compensation for providing girders, including all concrete, grout, mortar, reinforcement steel, tie bars, anchor plates, and other embedded metal; for casting and curing concrete; for jacking and prestressing; for all handling, hauling and erecting; and for discarding and replacing units damaged by improper handling or storage.

The department will accept prestressed concrete members with 28-day concrete cylinder strengths below the required 28-day compressive strength, as specified in standard spec 503.2.2, based on a pay reduction, if the 28-day concrete cylinder strength provided is greater than the engineer-determined design strength of the individual member. The department will reduce payment for an accepted member with 28-day concrete cylinder strength less than the required 28-day compressive strength by the greater of $500, or 20 percent of the contract unit price applied to the measured length of the member.

If the 28-day concrete cylinder strength for the prestressed concrete member falls below the engineer-determined design strength of the individual member, obtain cores from each member according to AASHTO T24, test according to AASHTO T22, and evaluate for strength comparison. Obtain the engineer’s approval for the core sample locations. If the average of 3 core strengths per member satisfies the design strength, and if none of the core strengths are less than 10 percent below the design strength, the engineer will accept the member based on the pay reduction defined above for deficient 28-day concrete cylinder strengths. The contractor may perform coring and testing, or an independent testing agency that the engineer approves may perform coring and testing. The engineer will observe coring and testing done by the contractor. All cost associated with taking, analyzing, and testing cores are the contractor’s responsibility.

336. Steel Casing w/ Ductile Iron 12-Inch Carrier, Item SPV.0090.5000; Steel Casing w/ Ductile Iron 16-Inch Carrier, Item SPV.0090.5001; Steel Casing w/ Ductile Iron 24-Inch Carrier, Item SPV.0090.5002.

A Description

This special provision describes the installation of a steel casing pipe with a Ductile Iron carrier pipe to the length and elevations as shown on the plans.

A.1 General

Perform work under these items in accordance to the details as shown on the plans and the requirements of the City of Milwaukee Water Main Installation Specifications, dated January 2, 1987 (City Water Main Specifications). Additionally, perform all work in accordance to the "Milwaukee Water Works Standard Plan Notes for Water Main Construction", June 14, 2011. Notes 4, 6, 16 through 18, and 21 shall not apply to this project. In case of conflicts between the City Water Main Specifications and the standard specifications or these special provisions, the requirements of the city standard specifications and the special provisions shall govern. Contact Ms. Angela Baldwin, at (414) 286-2813 to purchase copies of the required documents.

A.2 Submittals

Address all required submittals to Milwaukee Water Works as follows:

Superintendent
Milwaukee Water Works
Zeidler Municipal Building
841 North Broadway, Room 409
Milwaukee, WI 53202

B Materials

B.1 General

Furnish all fittings (restrained joint and standard) required for installation on this project. Water main shall be Restrained Joint Ductile Iron Thickness Class 55 pipe, conforming to the City of Milwaukee's Material Specifications and AWWA C-151. Furnish all fittings conforming to the City of Milwaukee's Material Specifications and AWWA C110.

Material specifications can be found at the following website:

http://city.milwaukee.gov/water/business/standardspecs.htm.

All materials will require inspection by the City of Milwaukee. Notify Mr. Mark Scheller, (414) 286-2427 or Mr. Steve Brengosz, (414) 708-2808, for materials inspection and the City of Milwaukee's Construction Section, (414) 286-2497, for construction inspection, four working days prior to starting construction.

Contractor to provide all necessary information for furnished steel and iron items to comply with Wisconsin Department of Transportation DT2249, "Utility's Certificate of Compliance for Steel and Iron Items".

Milwaukee Water Works will test all pipe, including restrained joint pipe, in accordance to the City of Milwaukee Material Testing Specifications. Material testing done by the city will remove at least one welded end from a restrained pipe piece. Provide enough pipe for testing and installation. The department will not pay for additional pipe length used for material testing purposes.

B.2 Steel Casing Pipe

For casing pipe up to and including 24-inch diameter, provide extra strong, seamless carbon steel pipe conforming to ASTM A53, Grade B. For casing pipe over 24-inch diameter, provide extra strong, spiral welded steel pipe conforming to ASTM A139, Grade B. Provide all steel casing pipe fabricated in sections for welded field joints. Steel casing shall have minimum yield strength of 35,000 psi and shall be spiral-welded steel pipe, uncoated, or equal. Steel casing shall have a minimum thickness as specified in the City Water Main Installation Specifications, Drawing No. 34. The casing pipe must have sufficient thickness to withstand both earth loads and live loads imposed from traffic. Provide engineer with manufacturer certification of steel casing pipe, including minimum yield strength, wall thickness, manufacturer, and ASTM Grade and class.

All welds shall be free from embedded scale and slag, and have a tensile strength across the weld not less than that of the thinner of the connected sections. Make all pipe welds watertight. Use butt welds for all shop-welded joints (to be approved by Milwaukee Water Works). Welders shall be certified as specified in AWWA C200 and C206. The use of back-up welding strips or rings for welds will not be permitted. Repair leaks and defects in welds as directed by Milwaukee Water Works.

Install wrap around pull on type boot seals, or approved equal on both ends of the Steel Casing pipe after pipe installation. The seals shall be watertight and the type of seal shall be approved by the engineer before backfilling. Seals shall have a minimum of two type 304 stainless steel bands with worm screws. Boot seals shall be provided by same manufacturer as casing spacers.

C Construction

Notify engineer and the WisDOT in accordance to permit requirements before commencing casing installation. Provide complete installation at line and grade indicated on Drawings.

Prepare and submit a plan to the engineer for approval for casing installation means and methods. When applicable, submittal shall include detailed information on bore pit size and location, type and size of equipment, shaft construction, advance auger tooling, means for controlling grade line, lubrication, welding, means for preventing voids, over-ream, and means to fill over-ream voids, and any information necessary for casing installation.

Limit over-reaming thickness to ½-inch. The contractor shall bear all the costs associated with sidewall over-reaming and concrete required to fill the additional over-reaming volume of excavation.

Ductile Iron carrier pipe shall be centered and restrained using stainless steel factory-fabricated (wood not allowed) spacers in conformance with manufacturer's specifications. Provide spacers at intervals according to manufacturers' specifications with a minimum two spacers for each pipe length. Spacers shall be located within 2' of the end of casing. Design spacers to prevent uplifting of carrier pipe by hydrostatic forces and attach to pipe using stainless steel bands minimum (1 inch) wide. Spacers shall be a minimum 12" wide with a minimum 6 runners per spacer. Shell, risers and spacers shall be type 304 stainless steel or approved equal. Casing spacers shall be provided by same manufacturer as end boot seals.

Store pipes on level ground free of sharp objects which could damage the pipe. Limit the Stacking of the pipe to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, store the pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Pipe shall be homogenous throughout and free of voids cracks, inclusions and other defects and shall be uniform in color, density and other physical characteristics.

Plug all open ends of all sections of joined and/or installed pipe (not in service) at night to prevent anything from entering the pipe line or section. The practice of stuffing cloth or paper in the open ends of the pipe will be considered unacceptable.

Prepare and submit a plan to the engineer for approval for insertion of the water main into the casing. Include pullback procedure, ballasting, use of rollers, side booms and side rollers, coating protection, internal cleaning, internal gauging, and purging in the plan.

Store excavated material from the boring and receiving pits in locations that minimize the interference with operations, minimize environmental damage, and protect adjacent areas from flooding, runoff and sedimentation.

Damage to utilities and the resulting repair, temporary service cost, etc., shall be borne by the contractor. Backfill access pits in accordance to the appropriate specifications.

Properly sheet/shore all excavations in accordance to relevant specifications for trench safety systems. Any damage resulting from improperly shored excavations shall be corrected to the satisfaction of the engineer with no compensation due to the contractor.

The Milwaukee Water Works will shut off the water main to be altered and provide temporary hose connections to affected services as required.

D Measurement

The department will measure Steel Casing w/ Ductile Iron Carrier 12-Inch, Steel Casing w/ Ductile Iron Carrier 16-Inch, and Steel Casing w/ Ductile Iron Carrier 24-Inch by the

linear foot of pipe in place measured along the top centerline of the casing, acceptably complete.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5000	Steel Casing w/ Ductile Iron 12-Inch Carrier	LF
SPV.0090.5001	Steel Casing w/ Ductile Iron 16-Inch Carrier	LF
SPV.0090.5002	Steel Casing w/ Ductile Iron 24-Inch Carrier	LF

Payment is full compensation for furnishing all labor, equipment, tools, materials and accessories required; for furnishing all surveying; excavating for sheeting and shoring, for laying pipe, for boring and receiving pit; for sheeting, shoring, bracing; for installing casing pipe, carrier pipe, spacers, end seals and lubricant work; for installing all valves and fittings; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for backfilling; for dewatering; for removing shoring, sheeting, bracing; for cleaning out the site of the work and incidentals necessary to complete the work and in accordance to the contract.

337. Ductile Iron Water Main 6-Inch, Item SPV.0090.5004, Ductile Iron Water Main 8-Inch, Item SPV.0090.5005, Ductile Iron Water Main 12-Inch Restrained Joint, Item SPV.0090.5006, Ductile Iron Water Main 16-Inch, Item SPV.0090.5007, Ductile Iron Water Main 16-Inch Restrained Joint, Item SPV.0090.5008, Ductile Iron Water Main 24-Inch Restrained Joint, Item SPV.0090.5009.

A Description

This special provision describes the installation of Ductile Iron water main alterations as shown on the plans.

A.1 General

Perform work under these items in accordance to the details as shown on the plans and the requirements of the City of Milwaukee Water Main Installation Specifications, dated January 2, 1987 (City Water Main Specifications). Additionally, perform all work in accordance to the "Milwaukee Water Works Standard Plan Notes for Water Main Construction", June 14, 2011. Notes 4, 6, 16 through 18, and 21 shall not apply to this project. In case of conflicts between the City Water Main Specifications and the standard specifications or these special provisions, the requirements of the city standard specifications and the special provisions shall govern. Contact Ms. Angela Baldwin, at (414) 286-2813 to purchase copies of the required documents.

A.2 Submittals

Address all required submittals to Milwaukee Water Works as follows:

Superintendent
Milwaukee Water Works
Zeidler Municipal Building
841 North Broadway, Room 409
Milwaukee, WI 53202

A.3 Sequence of Construction

Due to the nature of this work, including traffic staging and coordination with other work, the contractor is advised there may be multiple mobilizations to complete the water main work. No additional payment will be made by the department for said mobilizations.

Determine sequence and schedule for water main construction, subject to the requirements herein.

Prepare and submit for review by the Superintendent of Milwaukee Water Works a detailed construction schedule stating the anticipated dates and duration of all interruptions in water service necessary to complete the work under the contract, including the abandonment of existing water mains.

B Materials

B.1 General

Furnish all fittings (restrained joint and standard) required for installation on this project. Unless specified otherwise, water main shall be Push-on Rubber Gasket Joint Ductile Iron conforming to the latest version of the City of Milwaukee's Material Specifications. Water main specified as restrained joint, shall be Restrained Joint Ductile Iron Thickness Class 55 pipe, conforming to the City of Milwaukee's Material Specifications and AWWA C-151 with fittings conforming to the City of Milwaukee's Material Specifications and AWWA C110.

Material specifications can be found at the following website:

http://city.milwaukee.gov/water/business/standardspecs.htm.

All materials will require inspection by the City of Milwaukee. Notify Mr. Mark Scheller, (414) 286-2427 or Mr. Steve Brengosz, (414) 708-2808, for materials inspection and the City of Milwaukee's Construction Section, (414) 286-2497, for construction inspection, four working days prior to starting construction.

Contractor to provide all necessary information for furnished steel and iron items to comply with Wisconsin Department of Transportation DT2249, "Utility's Certificate of Compliance for Steel and Iron Items".

Milwaukee Water Works will test all pipe, in accordance to the City of Milwaukee Material Testing Specifications. Material testing done by the city will remove at least one welded end from a restrained pipe piece. Contractor to provide enough pipe for testing and

installation. The department will not pay for additional pipe length used for material testing purposes.

B.2 Valve Box Adapter
Install all valve boxes on gate valves with the use of valve box base adapters as detailed in the Standard Plan Notes Regarding Water Main Construction. Install the adapter in addition to the hardwood blocking.

C Construction
Ductile Iron Water Main 6-Inch, at Stations 49CH+48.7, 992AD+86.7, 998+57.7, 1001AD+16.2, 1011AD+55.10, 31.5'R, 1014AD+13.1, 31.7'R, and 1016AD+96.0, 4.4'L include 6-inch gate valve installations. All costs for completing the work required for the valve installations including valve boxes and extensions is to be included in the price for furnishing and installing 6-inch water main under this item.

Ductile Iron Water Main 8-Inch, at Stations 49CH+57.2, 14CHWM+01.7, 18CHWM+13.5, 19CHWM+93.4, 983AD+68.7, 987AD+22.4, 987AD+75.5, 990AD+23.5, 740FA+98.2 and 10CRWM+87.5 includes 8-inch gate valve installations. All costs for completing the work required for the valve installations including valve boxes and extensions is to be included in the price for furnishing and installing 8-inch water main under this item.

Ductile Iron Water Main 16-Inch, at Stations 49CH+53.7, 10CHWM+68.4, 14CHWM+25.6, 16CHWM+44.6, 989AD+98, 995AD+92.1, 998AD+27.3, 1002AD+02, 1002AD+05, 1004AD+01.2, 1010AD+92.6, 1011AD+15.4, 1011AD+76.1, 1014AD+34.9, 1016AD+48.5, 1019AD+29.9, 1019AD+39.1, 1019AD+49.2, 1019AD+53.8, 1023AD+36.6, 741FA+62.9, 11BCWM+25.0, 15BCWM+45.0, 19BCWM+45.0, and 23BCWM+45.0 include 16-inch butterfly valve installations. All costs for completing the work required for the valve installations including valve boxes and extensions is to be included in the price for furnishing and installing 16-inch water main under this item.

Ductile Iron Water Main 24-Inch Restrained Joint, at Station 28BCWM+41.9 includes a 24-inch butterfly valve installation. All costs for completing the work required for the valve installation including valve boxes and extensions is to be included in the price for furnishing and installing 24-inch water main under this item.

Install fittings as shown on plans, incidental to respective ductile iron water main item. A list of fittings for each water main installation is provided on plans.

Abandon existing water mains as shown on plans unless scheduled for removal in the utility removal plans. All costs for the abandonment of existing water main are to be included in the price for the Ductile Iron Water Main item(s). All costs for the removal of the existing water main are paid under a separate item.

The Milwaukee Water Works will shut off the water main to be altered and provide temporary hose connections to affected services as required.

D Measurement

The department will measure Ductile Iron Water Main 6-Inch, Ductile Iron Water Main 8-Inch, Ductile Iron Water Main 12-Inch Restrained Joint, Ductile Iron Water Main 16-Inch, Ductile Iron Water Main 16-Inch Restrained Joint, and Ductile Iron Water Main 24-Inch Restrained Joint by the linear foot of water main of the type and diameter specified, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5004	Ductile Iron Water Main 6-Inch	LF
SPV.0090.5005	Ductile Iron Water Main 8-Inch	LF
SPV.0090.5006	Ductile Iron Water Main 12-Inch Restrained Joint	LF
SPV.0090.5007	Ductile Iron Water Main 16-Inch	LF
SPV.0090.5008	Ductile Iron Water Main 16-Inch Restrained Joint	LF
SPV.0090.5009	Ductile Iron Water Main 24-Inch Restrained Joint	LF

Payment is full compensation for providing all labor, equipment, materials, valves, valve boxes, valve box extensions, fittings, and accessories required; for furnishing all surveying; excavating, for sheeting and shoring; for forming foundation; for laying pipe; for removing valves; for installing all valves, air vents, and fittings; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for providing granular backfill material, including bedding material; for backfilling; for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

338. Ductile Iron (DI) AWWA C-151 Class 55 Water Main 24-Inch, Item SPV.0090.5010; Ductile Iron (DI) AWWA C-151 Class 55 Water Main 16-Inch, Item SPV.0090.5011.

A Description

This work includes providing and installing ductile iron water main at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 General

Ductile iron (DI) piping shall be in accordance to AWWA C150, Class 55. Design pipe joint ends for rubber push-on gasket joints, conforming to AWWA C111.

Cast in or stamp on pipe manufacturer's mark, year of production, and "DI" or "DUCTILE."

Pipe shall be cement mortar lined and have internal and external bituminous coats.

B.2 Fittings
Fittings shall conform to AWWA C110, centrifugally cast in metal or sand-lined molds.

Use of compact fittings conforming to AWWA C153 is acceptable. In no case shall fitting grade rating be less than adjoining pipe. Fittings shall be from same manufacturer as pipe.

Nuts and bolts for joints and fittings shall be corrosion resistant steel, NSS Technologies, Inc., Cor-Blue or approved equal.

B.3 Polyethylene Sheeting for Pipe Corrosion Protection
Polyethylene sheeting conforming to ASTM D4976, Type I, Class B, color black, Grade E-1, 1200 psi tensile strength, minimum thickness of 8 mil. Tube diameter or sheet width shall conform to AWWA C105. Double wrap all water main and fittings.

Furnish tape for polyethylene sheeting that is 2-inch wide, black tape with rubber adhesive and minimum 9 mil polyethylene backing. Tape shall be 3M™ Preservation Sealing Tape 481 or an approved equal.

B.4 Trench Insulation
Extruded polystyrene board conforming to ASTM C578, Type V, rigid, closed cell type, with integral high density skin, Dow Chemical Company STYROFOAM™ Highload 100 or an approved equal.

Thermal Resistance: Typical 5 year aged value of R-5 per inch of thickness per ASTM C518.

Board Size: 24 x 96 x 2-inch thick. Square edges. Compressive Strength: Minimum 100 psi per ASTM D1621.

Water Absorption: 0.7 percent by volume maximum per ASTM D2842.

All bedding, cover and backfill materials shall meet City of Wauwatosa Standards and be approved by the City of Wauwatosa.

C Construction
C.1 General
In accordance to Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800) 242-8511 not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work

contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

Before beginning excavation of trench, contractor shall uncover stub end of existing water main to which relay is to connect, to permit adjustments in line and grade and verify connection required.

C.2 Installation of Ductile Iron Pipe

Join pipe and fittings by means of a compression type rubber gasket push-on joints conforming with AWWA C111.

Excavation and backfill for buried pipe shall conform to the Standard Specifications for Sewer and Water.

Remove lumped subsoil, boulders, and rock. If rock is encountered, remove to provide a clearance of at least 6 inches below and on each side of pipe, valves, and fittings.

Lay and maintain water mains to lines and grades established in the plans with fittings, valves, and hydrants at required locations.

Trench preparation shall proceed in advance of pipe installation only as far as can be backfilled in the same day.

Contractor shall not deviate from types of excavation indicated in the plans without prior concurrence of engineer except in case of roadways, driveways, and obstructions that may be indicated in the plans as open trench sections.

Place and shape bedding material to pipe, to a minimum depth of three inches under bell and four inches under spigot and compact to 95 percent modified proctor density.

Lower water main, fittings, valves, and hydrants carefully into trench, by means of derrick, ropes, or other suitable tools or equipment, to prevent damage to water main materials and protect coatings and linings.

Lay pipe with bell ends facing direction of laying. When grade exceeds 2 feet of rise per 100 feet of trench, bells shall face upgrade.

Provide holes for bells at each joint but no larger than necessary for joint assembly and assurance that pipe barrel will lie flat on trench bedding.

Trench bedding shall be true and even in order to provide support for full length of pipe barrel, except a slight depression may be provided to allow withdrawal of pipe slings or other lifting tackle.

If pipe laying crew cannot put pipe into trench and in place without getting earth into it, engineer may require placing, before lowering pipe into trench, a heavy, tightly woven, canvas bag of suitable size over each end of pipe and leaving there until connected to adjacent pipe.

Do not place debris, tools, clothing, or other materials in pipe during laying operations. Assemble joint and bring pipe to correct line and grade as each length of pipe is placed in trench.

Take precautions to prevent foreign materials from entering joint space and carefully check joint recess for foreign material before installing gasket.

Remove lumps of clay, mud, cinders, and similar materials that may have accumulated on surface of pipe during storage or laying and encase pipe in polyethylene sheeting in accordance to AWWA C105.

Secure pipe in place with bedding material, placed by hand or equally careful means, keeping bell end open. Remove pipe and fittings that do not allow sufficient and uniform space for joints and replace with pipe and fittings of proper dimensions to ensure such uniform space.

Upon daily and temporary completion of pipe installation, close open ends of pipe by a water-tight plug or other means approved by engineer. This provision applies during daytime inactivity as well as overnight.

If water is in trench, maintain pipe seal in place until water level is lowered four inches below pipe invert.

Whenever it becomes necessary to lay a main over, under, or around a known obstruction, contractor shall furnish and install required fittings. Laying of such fittings will be paid for at linear foot price for each size of main. No additional compensation will be paid to contractor for any expenses incurred because of such obstruction.

When an unknown underground structure interferes with work to such an extent that an alteration of the plans is required and alteration results in a change in cost to contractor, engineer will issue a written order for such altered work, specifying basis of payment or credit for such altered work.

Keep interior and exterior of pipe clean and free from foreign material before installation. Provide necessary means to wipe, brush, swab, or air blast to remove any foreign material from interior of pipe as instructed by pipe manufacturer and as directed by engineer.

Provide and place approved bedding sand and cover under and above water service to depths indicated in the plans. Provide and install crushed concrete backfill to depths indicated. Compact bedding sand and cover, and crushed concrete backfill to 95% modified proctor density.

C.3 Water Main Pressure and Leakage Testing
Pressure Testing:

After pipe has been laid, subject newly laid pipe or any valved section thereof to a hydrostatic pressure of at least 1.5 times working pressure at point of testing.

Tests pressures shall:

- Not be less than 1.25 times working pressure at highest point along test section.
- Not exceed pipe or thrust restraint design pressures.
- Be of at least 2-hour duration.
- Not vary by more than plus or minus 5 psi for duration of test.
- Not exceed twice rated pressure of valves or hydrants when pressure boundary of test section includes closed gate valves or hydrants. NOTE: Do not operate valves in either direction at differential pressure exceeding rated pressure.
- Not exceed rated pressure of valves when pressure boundary of test section included closed, resilient seated gate valves or butterfly valves.

Slowly fill each valved section of pipe and apply specified test pressure, based on elevation of lowest point of line or section under test and corrected to elevation of test gage, by means of a pump connected to pipe acceptable to engineer.

Do not operate valves in either opening or closing direction at differential pressures above rated pressure.

Before applying specified test pressure, completely expel air from section of pipe under test.

If permanent air vents are not located at all high points, Contractor shall install corporation cocks at such points to expel air as line is filled with water.

After all air has been expelled, close corporation cocks and apply test pressure. At conclusion of pressure test, remove corporation cocks and plug or leave in place at discretion of City of Wauwatosa.

Carefully examine exposed pipe, fittings, valves, hydrants, and joints during test.

Repair or replace any damaged or defective pipe, fittings, valves, or hydrants that are discovered following pressure test with sound material, and repeat test until it is satisfactory to City of Wauwatosa.

C.4 Leakage Testing
Leakage test may be conducted concurrently with pressure test.

Leakage shall be defined as quantity of water that must be supplied into newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of specified test pressure after air in pipeline has been expelled and pipe has been filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

No pipe installation will be accepted if leakage is greater than that determined by following formula:

L = SD times Square Root of P, divided by 133,200

Where L is allowable leakage in gallons per hour; S is length of pipe tested in linear feet; D is nominal diameter of pipe in inches; and P is average test pressure during leakage test in pounds per square inch gage.

When hydrants are in test section, test shall be made against main valve in hydrant. Acceptance shall be determined on basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified, contractor shall, at its own expense, locate and make repairs or replacement.

C.5 Flushing and Disinfection
Place calcium hypochlorite at upstream end of first section of pipe, at upstream end of each branch main, in first pipe section past valve, in hydrant leads, and at a minimum 500 foot interval in main.

Place the following amounts of calcium hypochlorite granules at beginning of main and at each 500-foot interval:

Pipe Diameter (Inches)	Calcium Hypochlorite Granules (Ounces)
4	0.5
6	1.0
8	2.0
12	4.0
16 and larger	8.0

Contractor may use tablets if prior approval is obtained from engineer. Procedure shall be as follows:

- Place one 5-gram calcium hypochlorite tablet in each hydrant, hydrant branch, and other appurtenance.
- Place 5-gram calcium hypochlorite tablets in accordance to the following table in each section of pipe.

Pipe Diameter (Inches)	Length of Pipe Section (feet)				
	<13	18	20	30	40
4	1	1	1	1	1
6	1	1	1	2	2
8	1	2	2	3	4
10	2	3	3	4	5
12	3	4	4	6	7
16	4	6	7	10	13

Based on 3.25 grams available chlorine per tablet, any portion of tablet rounded to next higher integer.

Attach tablets to inside and top at each end of newly installed pipe with an NSF 61 approved adhesive such as ITW Redhead A7, or an approved equal.

Do not apply adhesive to tablet except on broad side to be attached to surface of pipe.

If tablets are attached before pipe section is placed in trench, mark their position on section so it can be readily determined that pipe is installed with tablets at top.

When installation is completed, fill main with water at a rate such that water within main will flow at a velocity no greater than one foot per second.

Contractor shall separately meter and pay for water for filling and initial flushing of main.

Contractor shall provide labor and material necessary to transfer water from source to main to be tested. Only local City of Wauwatosa Water Utility employees shall operate valves.

Water shall enter main and be tested at low point in system to force entrapped air out at high end through an available hydrant or air release valve.

Close upper end hydrant or valve after air is expelled and chlorinated water discharge is present. Take precautions to assure that entrapped air is eliminated.

Water shall remain in pipe for at least 24 hours or as defined by regulatory requirements. If water temperature is less than 40 degrees F, water shall remain in pipe for at least 48 hours.

Position valves so that strong chlorine solution in main being treated will not flow into water mains in active service.

Water from new mains must successfully pass bacteriological test in accordance to requirements of Wisconsin Department of Natural Resources.

Properly and securely brace and maintain excavation until successful testing, flushing, chlorinating, and sampling of main is completed.

Contractor shall be responsible for protecting any required excavation by means of proper barricades and lanterns during sampling and testing period.

Provide access to main for sampling as directed by engineer. Water Utility will take necessary samples of water and obtain laboratory tests of samples.

D Measurement

The department will measure Ductile Iron (DI) AWWA C-151 Class 55 Water Main 24-Inch and Ductile Iron (DI) AWWA C-151 Class 55 Water Main 16-Inch by the linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5010	Ductile Iron (DI) AWWA C-151 Class 55 Water Main 24-Inch	LF
SPV.0090.5011	Ductile Iron (DI) AWWA C-151 Class 55 Water Main 16-Inch	LF

Payment is full compensation for furnishing all materials; fittings, joint restraint, flushing, testing, concrete buttresses, shoring, temporary piling, traffic control, dewatering, and for excavating, backfilling, and compaction.

339. Ductile Iron (DI) AWWA C-151 Class 55 Water Main 24-Inch with 42-Inch Steel Casing, Item SPV.0090.5012.

A Description

This work includes providing and installing ductile iron water main in a steel casing pipe at locations indicated in the plans, conforming to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and as hereinafter provided.

B Materials

B.1 General

Ductile iron (DI) piping shall be in accordance to AWWA C150, Class 55. Design pipe joint ends for rubber push-on gasket joints, conforming to AWWA C111.

Cast in or stamp on pipe manufacturer's mark, year of production, and "DI" or "DUCTILE."

Pipe shall be cement mortar lined and have internal and external bituminous coats.

Casing spacers shall be a two-piece shell per carrier pipe and made from T-304 stainless steel of a minimum 14-guage thickness. Each shell section shall be lined with a 0.090" thick, ribbed PVC extrusion with a retaining section that overlaps the edges of the shell and prevents slippage. Bearing surfaces (runners) shall be ultra high molecular weight polyethylene. The runners shall be attached to support structures (risers) at appropriate positions to properly support the carrier pipe within the casing pipe and to ease installation. The runners shall be mechanically bolted to the riser. Risers shall be made of T-304 stainless steel of a maximum 10 gauge. Spacers shall be sized such that the height of the risers and runners are to center the water main within the casing pipe.

Casing pipe end seals shall be neoprene with T-304 stainless steel restraint bands.

Steel casing pipe shall conform to the Standard Specifications for Sewer and Water Construction in Wisconsin, 6th Ed.

Limit over-reaming thickness to ½-inch. The contractor shall bear all the costs associated with sidewall over-reaming and concrete required to fill the additional over-reaming volume of excavation.

B.2 Fittings

Fittings shall conform to AWWA C110, centrifugally cast in metal or sand-lined molds.

Use of compact fittings conforming to AWWA C153 is acceptable. In no case shall fitting grade rating be less than adjoining pipe. Fittings shall be from same manufacturer as pipe.

Nuts and bolts for joints and fittings shall be corrosion resistant steel, NSS Technologies, Inc., Cor-Blue or approved equal.

C Construction

C.1 General

In accordance to Wisconsin Statute 182.0175, "Damage to Transmission Facilities," Excavator, as defined in 182.0175(1)(bm), shall be solely responsible to provide advance notice to "Diggers Hotline, Inc." (800) 242-8511 not less than three working days prior to commencement of any Excavation, as defined in the statute, required to perform work contained in this Project, and further, Excavator shall comply with all other requirements of this Statute relative to Excavation.

Before beginning excavation of trench, contractor shall uncover stub end of existing water main to which relay is to connect, to permit adjustments in line and grade and verify connection required.

C.2 Installation of Ductile Iron Pipe

Join pipe and fittings by means of a compression type rubber gasket push-on joints conforming with AWWA C111.

Excavation and backfill for buried pipe shall conform to the Standard Specifications for Sewer and Water.

Remove lumped subsoil, boulders, and rock. If rock is encountered, remove to provide a clearance of at least 6 inches below and on each side of pipe, valves, and fittings.

Lay and maintain water mains to lines and grades established in the plans with fittings, valves, and hydrants at required locations.

Contractor shall not deviate from types of excavation indicated in the plans without prior concurrence of engineer except in case of roadways, driveways, and obstructions that may be indicated in the plans as open trench sections.

Place and shape bedding material to pipe, to a minimum depth of three inches under bell and four inches under spigot and compact to 95 percent modified proctor density.

Lower water main, fittings, valves, and hydrants carefully into trench, by means of derrick, ropes, or other suitable tools or equipment, to prevent damage to water main materials and protect coatings and linings.

Lay pipe with bell ends facing direction of laying. When grade exceeds 2 feet of rise per 100 feet of trench, bells shall face upgrade.

Provide holes for bells at each joint but no larger than necessary for joint assembly and assurance that pipe barrel will lie flat on trench bedding.

Trench bedding shall be true and even in order to provide support for full length of pipe barrel, except a slight depression may be provided to allow withdrawal of pipe slings or other lifting tackle.

If pipe laying crew cannot put pipe into trench and in place without getting earth into it, engineer may require placing, before lowering pipe into trench, a heavy, tightly woven, canvas bag of suitable size over each end of pipe and leaving there until connected to adjacent pipe.

Do not place debris, tools, clothing, or other materials in pipe during laying operations. Assemble joint and bring pipe to correct line and grade as each length of pipe is placed in trench.

Take precautions to prevent foreign materials from entering joint space and carefully check joint recess for foreign material before installing gasket.

Remove lumps of clay, mud, cinders, and similar materials that may have accumulated on surface of pipe during storage or laying and encase pipe in polyethylene sheeting in accordance to AWWA C105.

Secure pipe in place with bedding material, placed by hand or equally careful means, keeping bell end open. Remove pipe and fittings that do not allow sufficient and uniform

space for joints and replace with pipe and fittings of proper dimensions to ensure such uniform space.

Upon daily and temporary completion of pipe installation, close open ends of pipe by a water-tight plug or other means approved by engineer. This provision applies during daytime inactivity as well as overnight.

If water is in trench, maintain pipe seal in place until water level is lowered four inches below pipe invert.

Keep interior and exterior of pipe clean and free from foreign material before installation. Provide necessary means to wipe, brush, swab, or air blast to remove any foreign material from interior of pipe as instructed by pipe manufacturer and as directed by engineer.

Provide and place approved bedding sand and cover under and above water service to depths indicated in the plans. Provide and install crushed concrete backfill to depths indicated. Compact bedding sand and cover, and crushed concrete backfill to 95% modified proctor density.

C.3 Water Main Pressure and Leakage Testing
Pressure Testing:

After pipe has been laid, subject newly laid pipe or any valved section thereof to a hydrostatic pressure of at least 1.5 times working pressure at point of testing.

Tests pressures shall:

- Not be less than 1.25 times working pressure at highest point along test section.
- Not exceed pipe or thrust restraint design pressures.
- Be of at least 2-hour duration.
- Not vary by more than plus or minus 5 psi for duration of test.
- Not exceed twice rated pressure of valves or hydrants when pressure boundary of test section includes closed gate valves or hydrants. NOTE: Do not operate valves in either direction at differential pressure exceeding rated pressure.
- Not exceed rated pressure of valves when pressure boundary of test section included closed, resilient seated gate valves or butterfly valves.

Slowly fill each valved section of pipe and apply specified test pressure, based on elevation of lowest point of line or section under test and corrected to elevation of test gage, by means of a pump connected to pipe acceptable to engineer.

Do not operate valves in either opening or closing direction at differential pressures above rated pressure.

Before applying specified test pressure, completely expel air from section of pipe under test.

If permanent air vents are not located at all high points, contractor shall install corporation cocks at such points to expel air as line is filled with water.

After all air has been expelled, close corporation cocks and apply test pressure. At conclusion of pressure test, remove corporation cocks and plug or leave in place at discretion of City of Wauwatosa.

Carefully examine exposed pipe, fittings, valves, hydrants, and joints during test.

Repair or replace any damaged or defective pipe, fittings, valves, or hydrants that are discovered following pressure test with sound material, and repeat test until it is satisfactory to City of Wauwatosa.

C.4 Leakage Testing

Leakage test may be conducted concurrently with pressure test.

Leakage shall be defined as quantity of water that must be supplied into newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of specified test pressure after air in pipeline has been expelled and pipe has been filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

No pipe installation will be accepted if leakage is greater than that determined by following formula:

> L = SD times Square Root of P, divided by 133,200
>
> Where L is allowable leakage in gallons per hour; S is length of pipe tested in linear feet; D is nominal diameter of pipe in inches; and P is average test pressure during leakage test in pounds per square inch gage.

When hydrants are in test section, test shall be made against main valve in hydrant.

Acceptance shall be determined on basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified, contractor shall, at its own expense, locate and make repairs or replacement.

C.5 Flushing and Disinfection

Place calcium hypochlorite at upstream end of first section of pipe, at upstream end of each branch main, in first pipe section past valve, in hydrant leads, and at a minimum 500 foot interval in main.

Place the following amounts of calcium hypochlorite granules at beginning of main and at each 500-foot interval:

Pipe Diameter (Inches)	Calcium Hypochlorite Granules (Ounces)
4	0.5
6	1.0
8	2.0
12	4.0
16 and larger	8.0

Contractor may use tablets if prior approval is obtained from engineer. Procedure shall be as follows:

- Place one 5-gram calcium hypochlorite tablet in each hydrant, hydrant branch, and other appurtenance.

- Place 5-gram calcium hypochlorite tablets in accordance to the following table in each section of pipe.

Pipe Diameter	Length of Pipe Section (feet)				
(Inches)	<13	18	20	30	40
4	1	1	1	1	1
6	1	1	1	2	2
8	1	2	2	3	4
10	2	3	3	4	5
12	3	4	4	6	7
16	4	6	7	10	13

Based on 3.25 grams available chlorine per tablet, any portion of tablet rounded to next higher integer.

Attach tablets to inside and top at each end of newly installed pipe with an NSF 61 approved adhesive such as ITW Redhead A7, or an approved equal.

Do not apply adhesive to tablet except on broad side to be attached to surface of pipe.

If tablets are attached before pipe section is placed in trench, mark their position on section so it can be readily determined that pipe is installed with tablets at top.

When installation is completed, fill main with water at a rate such that water within main will flow at a velocity no greater than one foot per second.

Contractor shall separately meter and pay for water for filling and initial flushing of main.

Contractor shall provide labor and material necessary to transfer water from source to main to be tested. Only local City of Wauwatosa Water Utility employees shall operate valves.

Water shall enter main and be tested at low point in system to force entrapped air out at high end through an available hydrant or air release valve.

Close upper end hydrant or valve after air is expelled and chlorinated water discharge is present. Take precautions to assure that entrapped air is eliminated.

Water shall remain in pipe for at least 24 hours or as defined by regulatory requirements. If water temperature is less than 40 degrees F, water shall remain in pipe for at least 48 hours.

Position valves so that strong chlorine solution in main being treated will not flow into water mains in active service.

Water from new mains must successfully pass bacteriological test in accordance to requirements of Wisconsin Department of Natural Resources.

Properly and securely brace and maintain excavation until successful testing, flushing, chlorinating, and sampling of main is completed.

Contractor shall be responsible for protecting any required excavation by means of proper barricades and lanterns during sampling and testing period.

Provide access to main for sampling as directed by engineer. Water Utility will take necessary samples of water and obtain laboratory tests of samples.

D Measurement

The department will measure Ductile Iron (DI) AWWA C-151 Class 55 Water Main 24-Inch With 42-Inch Steel Casing per linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5012	Ductile Iron (DI) AWWA C-151 Class 55 Water Main 24-Inch With 42-Inch Steel Casing	LF

Payment is full compensation for furnishing all materials; excavation of jacking and receiving pits, trenchless installation of water main and casing, temporary shoring, backfilling, and compacting.

340. Abandoning Sanitary Sewer 8-Inch, Item SPV.0090.5100, Abandoning Sanitary Sewer 12-Inch, Item SPV.0090.5102.

A Description

Perform the work in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

Notify the Milwaukee Metropolitan Sewerage District (MMSD), City of Milwaukee, City of Wauwatosa or "facility owner" of the commencement of construction at least three district business days in advance. Notify, in writing, all businesses and property owners/occupants within the project limits to inform them of the project and to inform them of any temporary sewer service disconnections. Provide and maintain all necessary bypass pumping for sanitary sewer abandonment.

B Materials

All materials and work required to abandon existing sanitary sewers will conform to the SSSW.

B.2 Cellular Concrete

Provide cellular concrete meeting the following specifications: 1 part cement, 1 part fly ash, 8 parts sand, or an approved equal, and water. Provide cement meeting the requirements of standard spec 501.2.1 for Type 1 Portland Cement. Provide sand meeting the requirements of standard spec 501.2.5.3. Provide water meeting the requirements of standard spec 501.2.4.

C Construction

Abandon sewers in accordance to Section 3.2.24 of the SSSW except modified to require all sewers which are to be abandoned and have not been removed shall be filled with cellular concrete. Field verify all active sewer laterals connected to the new sewer main prior to abandonment of any sewer.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Abandon Sanitary Sewer 8-Inch and Abandon Sanitary Sewer 12-Inch by the linear foot of sewer acceptably completed. The pipe will be measured horizontally to the nearest foot, through all manholes designated to be abandoned, from face to face of bulkheads, including the bulkhead thickness.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5100	Abandoning Sanitary Sewer 8-Inch	LF
SPV.0090.5102	Abandoning Sanitary Sewer 12-Inch	LF

Payment is full compensation for providing all materials including all excavating; for bulkheading and abandoning existing sanitary sewer with cellular concrete; for providing backfill slurry material; and for providing and maintaining all necessary bypass pumping for abandonment.

341. Sanitary Air Testing, Item SPV.0090.5103.

A Description

Perform the work in accordance to the plans and the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions. All mainline sanitary sewers shall be low pressure air tested in accordance to the requirements of Chapter 3.7.0 of the SSSW.

B Materials

Provide piping connections between sections of line being tested and air supply, together with test pressure equipment, meters, pressure gauge, and other equipment, materials and facilities necessary to make specified tests. Provide bulkheads, blocking, bracing or other temporary sectionalizing devices that may be required.

C Construction

Sanitary air testing shall be completed on all newly installed sections of sanitary mains except for those sections containing lateral connections.

Remove temporary sectionalizing devices after test complete. Plug pipe outlets with test plugs. Brace each plug securely to prevent blowouts during air test. Add air slowly while performing test. Pressurizing equipment shall include regulator set to avoid over-pressurizing and damaging line. Make air tests from manhole to manhole unless approved by City of Milwaukee Sewer Department.

D Measurement

The department will measure Sanitary Air Testing by the linear foot of tested pipe in place measured from the centerline of manhole to the centerline of manhole, or from point of connection to downstream pipe line not at centerline of manhole to centerline of upstream manhole or from centerline of manhole to the end of pipeline not ending at a manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5103	Sanitary Air Testing	LF

Payment is full compensation for completing full pressure test, including furnishing and installing all testing equipment, including meters, mandrels, lasers, gauges, and material required to complete the test.

342. Sanitary Sewer Lining 8-Inch Cured-In-Place, Item SPV.0090.5104.

A Description

Install cured-in-place pipe (CIPP) formed by the insertion of a resin-impregnated flexible felt tube, saturated with a thermosetting resin, installed into the existing pipeline and cured into a hard impermeable cured-in-place pipe at the depth and location shown on the plans.

Perform the work in accordance to the plans and the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, ASTM F1216-06, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube, and as hereinafter provided and these special provisions.

B Materials

B.1 General

The liner tube, resin and catalysts system shall meet the requirements defined in ASTM F1216-06, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube. Prepare and submit to engineer satisfactory written certification of compliance with the ASTM and manufacturer's standards for all materials and conformance with installation methods of ASTM and the manufacturer's process.

Resin system shall be corrosion resistant polyester, vinyl ester, or epoxy system including any required catalysts, initiators, or hardeners that when cured with tubes create a composite that satisfies requirements of ASTM F1216. Prepare and submit to engineer the exact makeup of the resin including chemical resistance information, cure logs and temperatures, and the exact mixture ratio of resin and catalyst. Identify the catalyst system by product name. Resins, catalysts, and resins/catalysts mixing ratios shall not be changed during the project unless specifically approved by the engineer in writing. The resin shall produce a cured-in-place pipe that will comply with the structural and chemical resistance requirements of this specification.

The cured-in-place pipe shall be fabricated from materials which, when cured, will be able to withstand internal exposure to and corrosive effects of normal sewage effluent liquids and gases containing hydrogen sulfide, carbon monoxide, carbon dioxide, methane, dilute

sulfuric acid, and external exposure to soil bacteria and chemical attack which may be due to materials in the surrounding ground or sewage within. Corrosion resistance shall meet the requirements of ASTM F1216.

The liner shall be fabricated to a size that when installed shall neatly and tightly fit the internal circumference and length of the original pipe being rehabilitated. Allowance for circumferential and longitudinal stretching during insertion shall be made per manufacturer's standards.

B.2 Structural Requirements

The minimum flexural modulus for the 8-inch diameter sanitary sewer lining shall be at least 250,0000 psi; A flexural modulus of 400,000 psi can be used at no additional cost. The minimum thickness of the cured in place liner shall be 6 millimeter (mm). The liner thickness shall be consistent throughout the project limits. Submit independent third-party test results showing the short term flexural modulus of the product to be used to the construction engineer. The cost for the testing is incidental to the cured in place lining work.

C Construction

C.1 General

The contractor shall be responsible for obtaining any necessary licenses or any fees due for using the cured-in-place lining. The cost of the licenses or fees shall be included in the unit price bid for the cured-in-place lining.

The contractor shall be responsible for obtaining any necessary city, County or State permits required for the successful completion of this project. All costs for obtaining shall be included in the unit price bid for the cured-in-place lining.

The contractor shall install cured-in-place lining with the requirements and recommendations of the product manufacturer for the conditions present at the site.

If the contractor damages the sewer during construction and is unable to complete the lining in a satisfactory manner, the contractor shall bear all costs associated with the dig-up and/or repair of the existing sewer damaged. No extra payment shall be made for this work.

Dye testing shall be performed if unknown sanitary laterals are encountered that may or may not be shown on the plans to determine whether a specific lateral is to be reconnected. Dye testing is incidental to this item.

Provide for bypassing of flow around sections of pipe designated for repair. Plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or adjacent system shall accomplish the bypass. The pumps and bypass lines shall be of adequate capacity to accommodate the sewage flow.

Following acceptance of installation work and testing, remove and legally dispose of debris resulting from work and unused materials from the site.

C.2 Cleaning

Prior to the installation of the cured-in-place lining clean the pipeline in accordance to ASTM F1216. Remove all internal debris, solids, roots, mineral deposits and protruding taps from the inside walls of the sewer. The debris, solids, roots, mineral deposits and protruding taps shall be removed to the extent that they do not interfere with the lining achieving its maximum strength. In no case shall mineral deposits or protruding taps extend into the pipes over 1/8 inches. Do not damage the existing sewers while removing the mineral deposits or protruding taps. Contractor shall not damage the existing sewers while cleaning the pipeline. The cost of mineral deposit or protruding tap removal shall be included in the unit price bid for the cured-in-place lining.

Any material, including mineral deposits displaced from the sewer by jet-cleaning, air/water blasting and protruding tap removal, shall be removed from the sewer. The contractor shall be responsible for disposing of the removed materials at a Department of Natural Resources (DNR) approved site. The cost of this shall be included in the unit price bid for the cured-in-place lining. The contractor shall clean the inner surface of the sewer by air, water or sand blasting in order to prepare the sewer for the cured-in-place lining. The cost of all work necessary to prepare the sewer for the installation of the lining shall be included in the unit price bid for the cured-in-place lining.

C.3 Preparation

Prior to the installation of the cured-in-place liner, inspect the sewer designated to receive the liner in accordance to ASTM F1216. Inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles and service connections by close circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of cured-in-place pipe into the pipelines, and it shall be noted so that these conditions can be corrected. Confirm the locations of all branch service connections prior to installing and curing the cured-in-place pipe. Structural defects such as cracks, concrete spalling, missing brick, protruding service connection, dropped joint, any open holes or other sources of the ground water infiltration that could negatively impact the integrity of the liner shall be repaired at these locations with proven construction methods approved by the construction engineer. The cost of this repair shall be included in the unit price bid for the cured-in-place lining.

All connections for building sewers and drains of record have been shown on the plan. Prior to installation of the cured-in-place liner pipe, field verify by Closed Circuit TV (CCTV) that all active sewer connections have been identified and that only active or proposed sewer connections are to be reestablished. The television camera shall be equipped with a rotating head to allow for positive identification of active building services and drains. Provide the engineer with a copy of the video exam and written report at least one week prior to the scheduled lining operations. The engineer will promptly review the exam for any discrepancies between the video exam and the plan.

C.4 Installation
Install cured-in-place pipe (CIPP) formed by the insertion of a resin-impregnated flexible felt tube, saturated with a thermosetting resin, installed into the existing pipeline and cured into a hard impermeable cured-in-place pipe. When cured, the cured-in-place pipe shall extend from end to end in a continuous tight fitting watertight pipe-within-a-pipe.

The tube shall be impregnated with resin in accordance to ASTM F1216 and manufacturer's standards. The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the potential loss of resin during installation through cracks and irregularities in the original pipe wall, as applicable. Designate a location where the uncured resin in the original containers and the unimpregnated fabric tube will be vacuum impregnated prior to installation. No liners on the project shall be "wet out" more than 72 hours prior to installation.

The resin impregnated fabric tube shall be inserted through an existing manhole or other approved access in accordance to ASTM and manufacturer's recommendations. Steps in existing manholes may interfere with the installation of the lining. Any manhole steps that interfere with the lining installation shall be removed. The cost of removing and replacing the manhole steps shall be included in the unit price bid for the cured-in-place lining. Care shall be taken during the insertion process to avoid overstressing of the fabric materials. Use of a lubricant during the insertion is allowed in accordance to the manufacturer's recommendations to reduce friction. The lubricant shall be nontoxic, unable to support bacterial growth, and shall not adversely affect the fluid to be transported. Such lubricant shall be in a container clearly marked as to its contents. The cured-in-place lining shall be placed through the spring line in the existing manholes.

After installation of the liner is completed and a temperature calibration mechanism is inserted, cure the liner in strict accordance to ASTM F1216 and manufacturer's standards.

Cool the finished cured-in-place pipe to specified temperature in strict accordance to ASTM F1216 and manufacturer's standards before relieving the internal pressure in the cured-in-place pipe. Care shall be taken in the release of the static head such that a vacuum will not be developed that could damage the newly installed cured-in-place pipe.

C.5 Inspection
Televise sanitary sewer post installation of the cured-in-place lining. All defects discovered during the post-installation television inspection shall be corrected and the sewer shall be re-televised. Provide the City of Milwaukee with two (2) copies of the post installation DVD examination and report of the sewer. These record exams will become the property of the City of Milwaukee. Televising is incidental to the sanitary sewer pipe bid item.

D Measurement

The department will measure Sanitary Sewer Lining 8-Inch Cured-In-Place by the linear foot of pipe in place measured along the top centerline of the casing, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5104	Sanitary Sewer Lining 8-Inch Cured-In-Place	LF

Payment is full compensation for furnishing all labor, equipment, tools, materials and incidentals including the pipe liner tube, resin, catalysts system, lubricants; for cleaning and disposal of any debris and correcting structural deficiencies of existing pipe prior to installation of the lining; removing and replacing manhole steps; installing the lining; for sheeting, shoring, bracing, excavations, dewatering; for removing shoring, removing sheeting, removing bracing; for backfilling; for sewage bypass pumping; for furnishing and installing all testing equipment and materials; for televising; and for site cleanup work in accordance to the contract.

343. Steel Casing w/ 8-Inch Sanitary Sewer Carrier, Item SPV.0090.5105; Steel Casing w/ 12-Inch Sanitary Sewer Carrier, Item SPV.0090.5106; Steel Casing w/ 6-Inch Sanitary Sewer Carrier, Item SPV.0090.5107.

A Description

Install a steel casing pipe to the length and elevations as shown on the plans and install carrier pipe in accordance to the plans.

Where jack and bore is called out on plans, bore and jack a steel casing pipe with carrier pipe to the length and elevations as shown on the plans. Otherwise furnish and install steel casing pipe with carrier pipe along with select bedding and cover material, to proposed line and grade, including granular backfill and compaction in accordance to the plans.

Perform the work in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

B.1 General

Casing pipe shall be made of steel conforming to ASTM A-139 grade B, ASTM A 53 grade B or approved equal. Steel pipe shall have minimum yield strength of 35,000 psi, and shall be spiral-welded steel pipe, uncoated, or equal. The casing pipe shall be a minimum of 18-inch diameter for 6-inch and 8-inch carrier pipe and a minimum of 24-inch for 12-inch carrier pipe unless specified otherwise in plans. The casing pipe must have

sufficient thickness to withstand both earth loads and live loads imposed from traffic. Contractor to provide engineer with manufacturer certification of steel casing pipe, including minimum yield strength, wall thickness, manufacturer, and ASTM Grade and class.

Provide a casing design for each required casing location. The adequacy of each casing design shall be verified by a professional engineer registered in the State of Wisconsin and be knowledgeable of the specific site conditions and requirements. Submit to the engineer for documentation one copy of each casing design that is signed and sealed by the same professional engineer verifying the design two weeks prior to installation.

Sanitary sewer carrier pipe shall be polyvinyl chloride (PVC) meeting the requirements of standard specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings of the ASTM D3034 for pipe sizes 4-inch through 15-inch. All PVC sewer pipe shall have maximum standard dimension ratio (SDR) of 35. Provide PVC material with a cell classification 12454-B or 12454-C as defined in ASTM D1784 with minimum modules of elasticity of 400,000 psi in tension. Provide a minimum pipe stiffness of 46 psi when tested in accordance to ASTM D2412.

Provide carrier pipe with elastomeric gasket bell and spigot joint conforming to ASTM D3212 sealed by a rubber gasket conforming to ASTM F477. Bells shall be formed integrally with the pipe.

Link seal modular seals, or approved equal shall be provided on both ends of the Steel Casing pipe after pipe installation. The seals shall be watertight and the type of seal shall be approved by the engineer before backfilling. Seals shall have type 316 stainless steel bolts and nuts.

B.2 Bedding

Bedding shall conform Class “C” bedding of section 3.2.6(a) and File No. 3 of the SSSW. Bedding material shall conform to Table 32 of Section 8.43.2 of the SSSW except the gradation requirements shall be modified as follows;

Gradation requirements for 3/8-Inch Crushed Stone Chips

Sieve sizes	Percent passing by weight
1/2-inch	100%
3/8-inch	90-100
No. 8	0-50
No. 30	0-5

B.3 Backfill

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

C.1 General

Notify engineer and the WisDOT in accordance to permit requirements before commencing casing installation. Provide complete installation at line and grade indicated on Drawings.

Prepare and submit a plan to the engineer for approval for casing installation means and methods. When applicable, submittal shall include detailed information on bore pit size and location, type and size of equipment, shaft construction, advance auger tooling, means for controlling grade line, lubrication, welding, means for preventing voids, over-ream, and means to fill over-ream voids, and any information necessary for casing installation.

Weld the joints of sections of casing pipe to be installed with a continuous circumferential weld.

Carrier pipe shall be centered and restrained using stainless steel factory-fabricated (wood not allowed) spacers in conformance with manufacturer's specifications. Provide spacers at intervals according to manufacturers' specifications with a minimum three spacers for each pipe length. Attach to pipe using stainless steel bands minimum (1 inch) wide. Spacers shall be a minimum 8" wide with a minimum 4 runners per spacer. Shell, risers and spacers shall be type 304 stainless steel or approved equal.

Install link seal modular seals, or approved equal on both ends of the Steel Casing pipe after pipe installation. The seals shall be watertight and the type of seal shall be approved by the engineer before backfilling. Seals shall have type 316 stainless steel bolts and nuts.

Properly sheet/shore all excavations in accordance to relevant specifications for trench safety systems. Any damage resulting from improperly shored excavations shall be corrected to the satisfaction of the engineer with no compensation due to the contractor.

Provide by-pass pumping of wastewater round construction zone during working hours. During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

C.2 Jack and Bore

Prepare and submit a plan to the engineer for approval for bore pit installation and insertion of the carrier pipe into the casing. Include locations, dimensions, shoring, ground support, method of spoil removal, surface storage, grouting techniques for filling annular voids by over excavation if any, methods of dewatering, pullback procedure, ballasting, use of rollers, side booms and side rollers, coating protection, internal cleaning, internal gauging, and purging in the plan.

Limit over-reaming thickness to ½-inch. The contractor shall bear all the costs associated with sidewall over-reaming and concrete required to fill the additional over-reaming volume of excavation.

Store excavated material from the boring and receiving pits in locations that minimize the interference with operations, minimize environmental damage, and protect adjacent areas from flooding, runoff and sedimentation.

Damage to utilities and the resulting repair, temporary service cost, etc., shall be borne by the contractor. Backfill access pits in accordance to the appropriate specifications.

C.3 Open Cut/Trenching

Provide sufficient and adequate equipment on the site of the work for unloading and lowering pipe and fittings into the trench. Store pipes on level ground free of sharp objects which could damage the pipe. Limit the stacking of the pipe to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, store the pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Excavate the trench to provide a smooth, compacted flat bottom. The width of trench shall accommodate the pipe and the use of compaction equipment between the pipe OD and trench wall.

Provide Class “C” bedding material. Place and compact pipe bedding material prior to setting the pipe. Minimum depth of bedding material beneath pipe bells shall be 4 inches. Pipe cover material shall be the same material as pipe bedding material. Cover material shall extend to one foot above the top of pipe and shall be placed and compacted in lifts to achieve uniform conformance with section 2.6.14(b) of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW, except the initial compacted lift shall be 2 feet, and shall be modified to read, “Each subsequent compacted lift of material shall be 1 foot”. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

C.2 Inspection

Provide a deflection test for all PVC sewer piping installed with a go-no-go mandrel in accordance to requirements of Section 3.2.6(i)4 of the SSSW for 5% deflection of the base inside diameter. The deflection of the sewer pipe shall not exceed 5.0 percent when tested with a mandrel specifically designed for the type and size of pipe installed. Any section of the completed sewer failing to pass the test shall be repaired and retested. Deflection test is incidental to the sanitary sewer pipe bid item.

Provide Closed Circuit Television (CCTV) Exams conforming to the requirements of the "Special Provision Notes for Sanitary Sewer Work" as found in the plans. All defects discovered during the post-installation television inspection shall be corrected and the sewer shall be re-televised. Provide the City of Milwaukee with two copies of the post installation DVD examination and report of the sewer. These record exams will become the property of the City of Milwaukee. Televising is incidental to the sanitary sewer pipe bid item.

D Measurement

The department will measure Steel Casing Pipe w/ 6-Inch Sanitary Sewer Carrier, Steel Casing Pipe w/ 8-Inch Sanitary Sewer Carrier, and 10-Inch Sanitary Sewer Carrier by the linear foot of pipe in place measured along the top centerline of the casing, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5105	Steel Casing w/ 8-Inch Sanitary Sewer Carrier	LF
SPV.0090.5106	Steel Casing w/ 10-Inch Sanitary Sewer Carrier	LF
SPV.0090.5107	Steel Casing w/ 6-Inch Sanitary Sewer Carrier	LF

Payment is full compensation for furnishing all labor, equipment, tools, materials and incidentals including sheeting, shoring, bracing, boring and receiving pit excavations, dewatering, casing pipe, removing shoring, removing sheeting, removing bracing, backfilling, spacers, carrier pipe, end seals, lubricant; for furnishing and installing all testing equipment and materials; for deflection testing; for televising; and for site cleanup work in accordance to the contract.

344. Sanitary Sewer Lateral Class "C" Bedding, Item SPV.0090.5108.

A Description

Furnish and install sanitary sewer lateral along with select bedding and cover material, to proposed line and grade, including granular backfill and compaction, in accordance to the plans.

Perform the work in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

B.1 General

Sanitary sewer lateral pipe shall be polyvinyl chloride (PVC) meeting the requirements of standard specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings

of the ASTM D3034 for pipe sizes 4-inch through 15-inch. All PVC sewer pipe shall have maximum standard dimension ratio (SDR) of 35. Provide PVC material with a cell classification 12454-B or 12454-C as defined in ASTM D1784 with minimum modules of elasticity of 400,000 psi in tension. Provide a minimum pipe stiffness of 46 psi when tested in accordance to ASTM D2412.

Provide pipe with elastomeric gasket bell and spigot joint conforming to ASTM D3212 sealed by a rubber gasket conforming to ASTM F477. Bells shall be formed integrally with the pipe.

Pipe shall be homogenous throughout and free of voids cracks, inclusions and other defects and shall be uniform in color, density and other physical characteristics.

Provide fittings such as tees, wyes, saddles, elbows, risers, and plugs of material and construction corresponding to and having a joint design compatible with the adjacent pipe. Provide FERNCO style connectors and adapters for transitions to other types of pipe.

Tracer wire shall conform to the requirements of Section 2.11.2 of the SSSW.

B.2 Bedding

Bedding shall conform Class "C" bedding of section 3.2.6(a) and File No. 3 of the SSSW. Bedding material shall conform to Table 32 of Section 8.43.2 of the SSSW except the gradation requirements shall be modified as follows;

Gradation requirements for 3/8-Inch Crushed Stone Chips

Sieve sizes	Percent passing by weight
1/2-inch	100%
3/8-inch	90-100
No. 8	0-50
No. 30	0-5

B.3 Backfill

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

All connections for building sewers of records have been shown on the plan. All active building sewers shall be reconnected to the new sewer. The contractor shall field verify all active laterals and shall only reconnect laterals which are found to be active. The cost of sewer lateral relay work not shown on plans shall be paid out by the linear foot unit price of the respective Sanitary Sewer Lateral item.

Provide sufficient and adequate equipment on the site of the work for unloading and lowering pipe and fittings into the trench. Store pipes on level ground free of sharp objects which could damage the pipe. Limit the stacking of the pipe to a height that will not cause

excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, store the pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Dye testing shall be performed on unknown sanitary laterals that may or may not be shown on the plans to determine whether a specific lateral is to be reconnected. Dye testing is incidental to this item.

The sanitary lateral shall match the size of the existing lateral except that the new installation shall not be less than 4 inches. The sanitary lateral shall extend from the mainline sewer pipe to the location where the connection to the existing service shall be made as shown in the plans.

Excavate the trench to provide a smooth, compacted flat bottom. The width of trench shall accommodate the pipe and the use of compaction equipment between the pipe OD and trench wall. Place and compact pipe bedding material prior to setting the pipe. Minimum depth of bedding material beneath pipe bells shall be 4 inches. Place pipe in conformance with Chapter 3.4.0 of the SSSW. The standard grades shall be a uniform rise of 1 inch in 4 feet (pitch=1/4 inch per foot). The minimum grade for building sewers shall be a uniform rise of 1 inch in 8 feet (pitch=1/8 inch per foot).

Building sewers connected to main sewers shall begin at a 45-degree slope to a point where the extension of the standard grade shall provide the standard depth at the lot line. In case of shallow main sewers where the standard depth cannot be obtained, the minimum grades shall be used in order to attain maximum depth at the lot line.

All building sewers connections into an 8-inch diameter PVC mainline sewer shall be made with a proper wyes or tees fitting. The contractor shall not be allowed to core connect any building sewers into a PVC mainline sewer of the 8-inch diameter size.

Pipe cover material shall be the same material as pipe bedding material. Cover material shall extend to one foot above the top of pipe and shall be placed and compacted in lifts to achieve uniform conformance with section 2.6.14(b) of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW, except the initial compacted lift shall be 2 feet, and shall be modified to read, “Each subsequent compacted lift of material shall be 1 foot”. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

C.2 Sanitary Sewer Lateral-330 S. 84th Street

Install a metallic tracer wire for building sanitary sewer lateral for the "Boys Scout Property" address 330 South 84th Street. All cost associated with this work is incidental to the Sanitary Sewer Lateral item. Tracer wire shall conform to the requirements of Section 2.11.2 of the SSSW.

D Measurement

The department will measure Sanitary Sewer Lateral Class "C" Bedding by the linear foot of pipe in place measured from the sanitary main or centerline of manhole to the point of connection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5108	Sanitary Sewer Lateral Class "C" Bedding	LF

Payment is full compensation for furnishing and installing all materials, including pipes, fittings, risers, gaskets and lubricant, tracer wire, bedding material, cover material, and granular backfill material; for dye testing; for furnishing all excavation, dewatering, by-pass pumping, sheathing and shoring, forming foundation, and pipe laying; for making all connections including furnishing and installing FERNCO and all necessary adapters, including temporary connections; for backfilling, mechanical compaction, and compaction testing; for removing sheathing and shoring; for disposal of all surplus or waste material; and for site cleanup. The cutting and removal of existing sanitary sewer lateral from within the trench of replacement sanitary sewer lateral will not be paid for separately, but shall be considered incidental to the item.

345. Sanitary Sewer 8-Inch SDR 35 Class "C" Bedding, Item SPV.0090.5109, Sanitary Sewer 10-Inch SDR 35 Class "C" Bedding, Item SPV.0090.5110, Sanitary Sewer 12-Inch SDR 35 Class "C" Bedding, Item SPV.0090.5111.

A Description

Furnish and install sanitary sewer along with select bedding and cover material, to proposed line and grade, including granular backfill and compaction, in accordance to the plans.

Perform the work in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

B.1 General

Sanitary sewer main pipe shall be polyvinyl chloride (PVC) meeting the requirements of standard specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings of the ASTM D3034 for pipe sizes 4-inch through 15-inch. All PVC sewer pipe shall have maximum standard dimension ratio (SDR) of 35. Provide PVC material with a cell classification 12454-B or 12454-C as defined in ASTM D1784 with minimum modules of elasticity of 400,000 psi in tension. Provide a minimum pipe stiffness of 46 psi when tested in accordance to ASTM D2412.

Provide pipe with elastomeric gasket bell and spigot joint conforming to ASTM D3212 sealed by a rubber gasket conforming to ASTM F477. Bells shall be formed integrally with the pipe.

Pipe shall be homogenous throughout and free of voids cracks, inclusions and other defects and shall be uniform in color, density and other physical characteristics.

Provide fittings such as tees, wyes, saddles, elbows and plugs of material and construction corresponding to and having a joint design compatible with the adjacent pipe. Provide FERNCO style connectors and adapters for transitions to other types of pipe. Provide concrete collars for connections in locations as specified on the plans.

B.2 Bedding

Bedding shall conform Class "C" bedding of section 3.2.6(a) and File No. 3 of the SSSW. Bedding material shall conform to Table 32 of Section 8.43.2 of the SSSW except the gradation requirements shall be modified as follows;

Gradation requirements for 3/8-Inch Crushed Stone Chips

Sieve sizes	Percent passing by weight
1/2-inch	100%
3/8-inch	90-100
No. 8	0-50
No. 30	0-5

B.3 Backfill

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

Provide sufficient and adequate equipment on the site of the work for unloading and lowering pipe and fittings into the trench. Store pipes on level ground free of sharp objects which could damage the pipe. Limit the stacking of the pipe to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, store the pipe on wooden sleepers,

spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Build concrete collar where specified on the plan. The concrete collar shall be a minimum 12 inches thick from the extreme edge of the sewer and a minimum of 24 inches long, centered from the transit lines of both the existing and new pipe. Protect and support all the existing utilities while installing concrete collar. Build fernco between the existing and proposed cut pieces of the pipe, if PVC pipe is used. If the distance from cut pieces of pipe to bell or spigot is less than three feet, the contractor shall connect to the nearest bell or spigot. All the cost of this work is incidental to sewer work.

Excavate the trench to provide a smooth, compacted flat bottom. The width of trench shall accommodate the pipe and the use of compaction equipment between the pipe OD and trench wall. Place and compact pipe bedding material prior to setting the pipe. Minimum depth of bedding material beneath pipe bells shall be 4 inches. Pipe cover material shall be the same material as pipe bedding material. Cover material shall extend to one foot above the top of pipe and shall be placed and compacted in lifts to achieve uniform conformance with section 2.6.14(b) of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW, except the initial compacted lift shall be 2 feet, and shall be modified to read, “Each subsequent compacted lift of material shall be 1 foot”. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

C.2 Inspection

Provide a deflection test for all PVC sewer piping installed with a go-no-go mandrel in accordance to requirements of Section 3.2.6(i)4 of the SSSW for 5% deflection of the base inside diameter. The deflection of the sewer pipe shall not exceed 5.0 percent when tested with a mandrel specifically designed for the type and size of pipe installed. Any section of the completed sewer failing to pass the test shall be repaired and retested. Deflection test is incidental to the sanitary sewer pipe bid item.

Provide Closed Circuit Television (CCTV) Exams conforming to the requirements of the “Special Provision Notes for Sanitary Sewer Work” as found in the plans. All defects discovered during the post-installation television inspection shall be corrected and the sewer shall be re-televised. Provide the City of Milwaukee with two copies of the post

installation DVD examination and report of the sewer. These record exams will become the property of the City of Milwaukee. Televising is incidental to the sanitary sewer pipe bid item.

D Measurement

The department will measure Sanitary Sewer 8-inch SDR 35 Class "C" Bedding, Sanitary Sewer 10-inch SDR 35 Class "C" Bedding, and Sanitary Sewer 12-inch SDR 35 Class "C" Bedding by the linear foot of pipe in place measured from the centerline of manhole to the centerline of manhole, or from point of connection to downstream pipe line not at centerline of manhole to centerline of upstream manhole or from centerline of manhole to the end of pipeline not ending at a manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5109	Sanitary Sewer 8-Inch SDR 35 Class "C" Bedding	LF
SPV.0090.5110	Sanitary Sewer 10-Inch SDR 35 Class "C" Bedding	LF
SPV.0090.5111	Sanitary Sewer 12-Inch SDR 35 Class "C" Bedding	LF

Payment is full compensation for furnishing and installing all materials, including pipes, gaskets and lubricant, bedding material, cover material, and granular backfill material; for furnishing all excavation, dewatering, by-pass pumping, sheathing and shoring, forming foundation, and pipe laying; for making all connections including furnishing and installing concrete collar, fernco and all necessary adapters, including temporary connections; for backfilling, mechanical compaction, and compaction testing; for removing sheathing and shoring; for disposal of all surplus or waste material; for furnishing and installing all testing equipment and materials; for deflection testing; for televising; and for site cleanup work in accordance to the contract. The cutting and removal of existing sanitary sewer pipe and manholes from within the trench of replacement sanitary sewer will not be paid for separately, but shall be considered incidental to the item.

346. Sanitary Sewer 8-Inch SDR 26 Class "C" Bedding, Item SPV.0090.5112; Sanitary Sewer 12-Inch SDR 26 Class "C" Bedding, Item SPV.0090.5113.

A Description

Furnish and install sanitary sewer along with select bedding and cover material, to proposed line and grade, including granular backfill and compaction, in accordance to the plans.

Perform the work in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

B.1 General

Sanitary sewer main pipe shall be polyvinyl chloride (PVC) meeting the requirements of standard specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings of the ASTM D3034 for pipe sizes 4-inch through 15-inch. All PVC sewer pipe shall have maximum standard dimension ratio (SDR) of 26. Provide PVC material with a cell classification 12454-B or 12454-C as defined in ASTM D1784 with minimum modules of elasticity of 400,000 psi in tension. Provide a minimum pipe stiffness of 115 psi when tested in accordance to ASTM D2412.

Provide pipe with elastomeric gasket bell and spigot joint conforming to ASTM D3212 sealed by a rubber gasket conforming to ASTM F477. Bells shall be formed integrally with the pipe.

Pipe shall be homogenous throughout and free of voids cracks, inclusions and other defects and shall be uniform in color, density and other physical characteristics.

Provide fittings such as tees, wyes, saddles, elbows and plugs of material and construction corresponding to and having a joint design compatible with the adjacent pipe. Provide FERNCO style connectors and adapters for transitions to other types of pipe. Provide concrete collars for connections in locations as specified on the plans.

B.2 Bedding

Bedding shall conform Class "C" bedding of section 3.2.6(a) and File No. 3 of the SSSW. Bedding material shall conform to Table 32 of Section 8.43.2 of the SSSW except the gradation requirements shall be modified as follows;

Gradation requirements for 3/8-Inch Crushed Stone Chips

Sieve sizes	Percent passing by weight
1/2-inch	100%
3/8-inch	90-100
No. 8	0-50
No. 30	0-5

B.3 Backfill

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

Provide sufficient and adequate equipment on the site of the work for unloading and lowering pipe and fittings into the trench. Store pipes on level ground free of sharp objects which could damage the pipe. Limit the stacking of the pipe to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, store the pipe on wooden sleepers,

spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Build concrete collar where specified on the plan. The concrete collar shall be a minimum 12 inches thick from the extreme edge of the sewer and a minimum of 24 inches long, centered from the transit lines of both the existing and new pipe. Protect and support all the existing utilities while installing concrete collar. Build fernco between the existing and proposed cut pieces of the pipe, if PVC pipe is used. If the distance from cut pieces of pipe to bell or spigot is less than 3 feet, the contractor shall connect to the nearest bell or spigot. All the cost of this work is incidental to sewer work.

Excavate the trench to provide a smooth, compacted flat bottom. The width of trench shall accommodate the pipe and the use of compaction equipment between the pipe OD and trench wall. Place and compact pipe bedding material prior to setting the pipe. Minimum depth of bedding material beneath pipe bells shall be 4 inches. Pipe cover material shall be the same material as pipe bedding material. Cover material shall extend to one foot above the top of pipe and shall be placed and compacted in lifts to achieve uniform conformance with section 2.6.14(b) of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW, except the initial compacted lift shall be two (2) feet, and shall be modified to read, “Each subsequent compacted lift of material shall be one (1) foot”. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Provide by-pass pumping of wastewater round construction zone during working hours. During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

C.2 Inspection

Provide a deflection test for all PVC sewer piping installed with a go-no-go mandrel in accordance to requirements of Section 3.2.6(i)4 of the SSSW for 5% deflection of the base inside diameter. The deflection of the sewer pipe shall not exceed 5.0 percent when tested with a mandrel specifically designed for the type and size of pipe installed. Any section of the completed sewer failing to pass the test shall be repaired and retested. Deflection test is incidental to the sanitary sewer pipe bid item.

Provide Closed Circuit Television (CCTV) Exams conforming to the requirements of the “Special Provision Notes for Sanitary Sewer Work” as found in the plans for all new sanitary sewer owned by the City of Milwaukee. All defects discovered during the post-installation television inspection shall be corrected and the sewer shall be re-televised. Provide the City of Milwaukee with two copies of the post installation DVD examination

and report of the sewer. These record exams will become the property of the City of Milwaukee. Televising is incidental to the sanitary sewer pipe bid item.

D Measurement

The department will measure Sanitary Sewer 8-inch SDR 26 Class "C" Bedding and Sanitary Sewer 12-inch SDR 26 Class "C" Bedding by the linear foot of pipe in place measured from the centerline of manhole to the centerline of manhole, or from point of connection to downstream pipe line not at centerline of manhole to centerline of upstream manhole or from centerline of manhole to the end of pipeline not ending at a manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5112	Sanitary Sewer 8-Inch SDR 26 Class "C" Bedding	LF
SPV.0090.5113	Sanitary Sewer 12-Inch SDR 26 Class "C" Bedding	LF

Payment is full compensation for furnishing and installing all materials, including pipes, gaskets and lubricant, bedding material, cover material, and granular backfill material; for furnishing all excavation, dewatering, by-pass pumping, sheathing and shoring, forming foundation, and pipe laying; for making all connections including furnishing and installing concrete collar, fernco and all necessary adapters, including temporary connections; for backfilling, mechanical compaction, and compaction testing; for removing sheathing and shoring; for disposal of all surplus or waste material; for furnishing and installing all testing equipment and materials; for deflection testing; for televising; and for site cleanup work in accordance to the contract. The cutting and removal of existing sanitary sewer pipe and manholes from within the trench of replacement sanitary sewer will not be paid for separately, but shall be considered incidental to the item.

347. Sanitary Sewer 12-Inch RCP Class V with Concrete Encasement, Item SPV.0090.5114.

A Description

Furnish and install sanitary sewer and concrete encasement to proposed line and grade, including granular backfill and compaction, in accordance to the plans.

Perform the work in accordance to the plans, Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

B.1 Reinforced Concrete Pipe

Sanitary sewer main pipe shall be reinforced concrete pipe (RCP), class V conforming to the requirements of ASTM Designation C-76 and Chapter 8.6.0 of the SSSW.

B.2 Concrete

Concrete for encasement shall be Class D Concrete conforming to the requirements of Chapter 8.35.0 and Table 29 of Chapter 8 of the SSSW.

The engineer reserves the right to take samples of concrete whenever he deems necessary.

B.3 Steel Reinforcement

Steel reinforcement shall conform to C-478 requirements of ASTM specifications.

B.4 Bentonite Waterstops

The bentonite waterstop material shall be the 1-inch by 3/4 inch size flexible strip of bentonite waterproofing compound with an adhesive surface on one side of the strip, and it shall be the waterstop Type RX, as manufactured by the American colloid Company, Arlington Heights, IL, or approved equal.

B.5 Bonding Agent

Bonding agent for installing waterstops in grooves cut into existing concrete shall be Sikastix 391, Sikadur Hi-Mod Gel; Horn Co. Epoxtite Grout 2388, or equal. Bonding agent for use on existing concrete surfaces shall be Sikastix 370, Sikadur Hi-Mod; Horn Co. Epoxtite Binder 2385; or equal.

B.2 Bedding

Bedding shall conform Class "C" bedding of section 3.2.6(a) and File No. 3 of the SSSW. Bedding material shall conform to Table 32 of Section 8.43.2 of the SSSW except the gradation requirements shall be modified as follows;

Gradation requirements for 3/8-Inch Crushed Stone Chips

Sieve sizes	Percent passing by weight
1/2-inch	100%
3/8-inch	90-100
No. 8	0-50
No. 30	0-5

B.3 Backfill

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

Provide sufficient and adequate equipment on the site of the work for unloading and lowering pipe and fittings into the trench. Store pipes on level ground free of sharp objects

which could damage the pipe. Limit the stacking of the pipe to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, store the pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Excavate the trench to provide a smooth, compacted flat bottom. The width of trench shall accommodate the pipe, the concrete encasement, and the use of compaction equipment between the pipe OD and trench wall. Place and compact pipe bedding material prior to setting the pipe. Minimum depth of bedding material beneath pipe bells shall be 4 inches. Pipe cover material shall be the same material as pipe bedding material. Cover material shall extend to one foot above the top of pipe and shall be placed and compacted in lifts to achieve uniform conformance with section 2.6.14(b) of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW, except the initial compacted lift shall be 2 feet, and shall be modified to read, "Each subsequent compacted lift of material shall be 1 foot". Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

C.2 Inspection

Provide a deflection test for all PVC sewer piping installed with a go-no-go mandrel in accordance to requirements of Section 3.2.6(i)4 of the SSSW for 5% deflection of the base inside diameter. The deflection of the sewer pipe shall not exceed 5.0 percent when tested with a mandrel specifically designed for the type and size of pipe installed. Any section of the completed sewer failing to pass the test shall be repaired and retested. Deflection test is incidental to the sanitary sewer pipe bid item.

Provide Closed Circuit Television (CCTV) Exams conforming to the requirements of the "Special Provision Notes for Sanitary Sewer Work" as found in the plans. All defects discovered during the post-installation television inspection shall be corrected and the sewer shall be re-televised. Provide the City of Milwaukee with two copies of the post installation DVD examination and report of the sewer. These record exams will become the property of the City of Milwaukee. Televising is incidental to the sanitary sewer pipe bid item.

D Measurement

The department will measure Sanitary Sewer 12-Inch RCP Class V with Concrete Encasement by the linear foot of pipe in place measured from the centerline of manhole to the centerline of manhole, or from point of connection to downstream pipe line not at centerline of manhole to centerline of upstream manhole or from centerline of manhole to the end of pipeline not ending at a manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5114	Sanitary Sewer 12-Inch RCP Class V with Concrete Encasement	LF

Payment is full compensation for furnishing and installing all materials, including pipes, gaskets and lubricant, bedding material, cover material, and granular backfill material; for furnishing all excavation, dewatering, by-pass pumping, sheathing and shoring, forming foundation, and pipe laying; for making all connections and all necessary adapters, including temporary connections; for backfilling, mechanical compaction, and compaction testing; for removing sheathing and shoring; for disposal of all surplus or waste material; for furnishing and installing all testing equipment and materials; for deflection testing; for televising; and for site cleanup work in accordance to the contract. The cutting and removal of existing sanitary sewer pipe and manholes from within the trench of replacement sanitary sewer will not be paid for separately, but shall be considered incidental to the item.

348. Removing Sanitary Sewer Pipe, Item SPV. 0090.5115.

A Description

This special provision describes completely removing existing sanitary sewer pipe and disposing of all resulting materials in accordance to the plans, Standard Specifications for Highway and Structure Construction, latest edition and amendments, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

B Materials

Granular backfill as required in Chapter 2.6.2 of the SSSW, shall conform to the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

C Construction

Remove the sanitary sewer pipe in its entirety. Perform work in accordance to the pertinent specifications of standard spec 204. The contractor is responsible for the safe methods and sequence of controlled removal operations. Completely remove the existing utility to the extent required to avoid interfering with new construction work as shown on plans and as directed by the engineer.

The cutting and removal of existing sanitary sewer pipe from within the trench of replacement sanitary sewer will not be paid for separately, but shall be considered incidental to the respective sanitary sewer item.

Thoroughly clean the ends of the existing pipe to remain and abandon in accordance to Section 3.2.24 of the SSSW.

Provide granular backfill as required in Chapter 2.6.2 of the SSSW, meeting the requirements for Base Aggregate Dense 3/4-Inch, of standard spec 305.1.

Consolidate all backfill by mechanical compaction per specification 2.6.14(b) of the SSSW. Special compaction equipment and measures are required where standard compaction equipment cannot be utilized. Flooding of backfill will not be allowed. Compaction shall achieve uniform consolidation in conformance with section 2.6.14(b) of the SSSW.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Removing Sanitary Sewer Pipe by the linear foot, acceptably completed, measured horizontally to the nearest foot from face to face of bulkheads along the centerline of the pipe.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5115	Removing Sanitary Sewer Pipe	LF

Payment is full compensation for providing all excavating; furnishing and installing all materials; for cutting and removing existing sanitary sewer pipe; for abandoning unused sewers; for furnishing and placing granular backfill; for hauling and disposing of all materials; and for furnishing all labor, tools, equipment, transportation, and incidentals necessary to complete the work in accordance to the contract.

349. Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-III 77x121-Inch, Item SPV.0090.8002; Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 77x121-Inch, Item SPV.0090.8003; Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 38x60-Inch, Item SPV.0090.8004.

A Description

Furnish and install reinforced concrete pipe storm sewers.

B Materials
Conform to materials as per standard spec 610.2(1).

Provide storm sewer reinforced concrete (Class) (size) conforming to Concrete D-Load Pipe ASTM C 507 specifications.

Provide storm sewer pipe reinforced concrete pipe (Class) (size) conforming to Concrete D-Load Pipe ASTM C 507 specifications. The design strength of the pipe shall be the D-load to produce the 0.01-inch crack carrying HL 93 truck load and maximum fill height over the pipe as shown on the plan.

The storm sewer pipe reinforced concrete pipe (class) (size) design shall be responsibility of the contractor and shall be designed by a professional engineer, registered in the State of Wisconsin, with knowledge of the specific site conditions and requirements. Submit one copy of the storm sewer pipe design, signed and sealed, to the engineer for incorporation into the permanent project record.

C Construction
Construct in accordance to the plans and standard spec 610.3.

Place factory lubricated gasket over the spigot end or tongue of the entering pipe. Clean the gasket and the ends of the pipe from sand and gravel. Place the spigot or tongue of the pipe being laid with the gasket in place into the bell or groove end of the previously laid pipe. Set pipe carefully to line and grade, and push or jack home. The engineer can order the use of a jack or "come-along" if deemed necessary to ensure that the joints are completely tight.

D Measurement
The department will measure Storm Sewer Pipe Reinforced Concrete (Class) (Size) bid item(s) by the linear foot acceptably completed. The measured quantity equals the number of linear feet of pipe measured along the centerline of the pipe. The department will measure from center to center of drainage Storm Sewer Structure. The department will make no deduction from these measured lengths for intermediate Storm Sewer Structures or fittings.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.8002	Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-III 77x121-Inch	LF
SPV.0090.8003	Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 77x121-Inch	LF
SPV.0090.8004	Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 38x60-Inch	LF

Payment will conform to standard spec 610.5 and submitting one copy of storm sewer pipe design, signed and sealed by a professional engineer registered in the State of Wisconsin.

No separate payment will be made for placing and or installing factory lubricated gaskets.

350. Pipe Underdrain Exploration, Item SPV.0090.8025; Storm Sewer Lateral Exploration, Item SPV.0090.8026.

A General
This special provision describes performing the exploratory trenching in sufficient advance of the grading and storm sewer construction operations to allow uninterrupted progress of these operations.

B (Vacant)

C Construction
Construct the trench a minimum 12 inches wide and deep enough to intercept all existing pipes (underdrain pipes and storm sewer laterals). Do not backfill trench until approved by the engineer. Backfill with suitable fill material conforming to standard spec 209.

D Measurement
The department will measure Pipe Underdrain Exploration and Storm Sewer Lateral Exploration by the linear foot, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.8025	Pipe Underdrain Exploration	LF
SPV.0090.8026	Storm Sewer Lateral Exploration	LF

Payment is full compensation for furnishing all excavating, for placing and compacting backfill material, for restoring the work site.

351. Drain Slotted Vane Longitudinal, Item SPV.0090.8030.

A Description
This special provision describes furnishing and installing Drain Slotted Vane Longitudinal and Drain Slotted Vane Longitudinal Temporary as shown on the plans, in accordance to standard specs 501, 505, 607, and 611, and as hereinafter provided.

B Materials

Construct the pipe that the vane drain casting rests in using 15-inch diameter SDR-35 poly vinyl chloride, (PVC) sewer pipe.

Conform to standard spec 611 for all other materials.

Conform to standard spec 415.2.1 for encasing material around the pipe.

Furnish steel reinforcement conforming to standard spec 415.2.2

Furnish concrete curing compounds conforming to standard spec 415.2.4.

C Construction

Prior to encasing the pipe in concrete, cover the upper end of the slotted drain as shown on the plans. Otherwise, obtain engineer approval prior to any variations.

Prior to construction operations adjacent to the slotted area of the slotted vane drain pipe, cover the slots on the top of the drain. Remove any material entering the pipe at own expense.

Exercise care to avoid damage to the slotted vane drainpipe. If any section of pipe is damaged or is unsatisfactory as determined by the engineer, replace the drainpipe at own expense.

Remove Drain Slotted Vane Longitudinal Temporary prior to constructing the roadway to its final condition. Repair opening in drainage structure at connection to Drain Slotted Vane Longitudinal Temporary. Ensure engineer approval of submitted method of repair.

D Measurement

The department will measure Drain Slotted Vane Longitudinal by the linear foot, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.8030	Drain Slotted Vane Longitudinal	LF

Payment is full compensation for furnishing all materials, including PVC pipe and end cap, slotted vane drain castings, concrete masonry and reinforcement; adjusting bricks; drilling inlet or manhole cover to accommodate connection bolts to vane drain; hauling and placing the pipe; making connections to existing inlets; sawing; encasement material around the pipe; concrete curing compound; tie bars and dowel bars cleaning out and restoring site of work; removing and disposing of all materials for Drain Slotted Vane Longitudinal Temporary, and for repairing opening of drainage structure.

352. Tunnel Excavation, Item SPV.0090.8096.

A Description

This section includes the requirements for tunnel excavation of Storm Sewer Pipe between manholes Z2683, Z2791, Z2815, Z2817, Z2820 and Z2822, using a one-pass system, utilizing Microtunnel Boring Machine (MTBM), followed by a jacked reinforced concrete pipe.

A.1 Contractor's Qualifications

The contractor or the subcontractor hired to perform the tunneling operations shall have a successful record with similar construction for a minimum of 5 years and a minimum of five similar projects (i.e., tunnel bores in soil with an outside diameter of 5 feet or larger and a total tunnel length of more than 500 feet per project or longer) and a demonstrated ability and capacity to perform the work under this contract to the satisfaction of the engineer.

The contractor shall provide personnel meeting the qualification requirements as stated below. The engineer may suspend work with no additional compensation or schedule extension, if the contractor substitutes unqualified personnel for accepted personnel during construction. If work is suspended due to the substitution of unqualified personnel, adjustment in contract time resulting from the suspension of work will not be permitted.

Superintendent: Each shift shall be supervised by at least one person with previous experience of the work. The superintendent must have at least 5 years and 1,000 feet of experience in similar-sized projects (minimum three projects).

Operator: System operators shall be experienced personnel with prior knowledge and ability in the proper operation of the systems being employed. Operators must have at least 5 years' experience and have completed at least 1,000 feet of tunnel with similar equipment on at least three projects.

Surveyor: The contractor's surveyor responsible for line-and-grade control shall be a Licensed Surveyor registered in the State of Wisconsin who has prior experience in similar projects.

Contractor shall provide evidence of OSHA certification for site safety representative and personnel responsible for air quality monitoring.

B Materials

B.1 General

The contractor is responsible to supply all materials, equipment, qualified personal, and submittals required to meet these specifications. The contractor shall select a MTBM that meets the requirements presented below.

In the event that other specification clauses cause ambiguity or conflict with this special provision, this special provisions shall take precedence unless otherwise accepted by the engineer. Open-face or no-face-pressure mining methods are not permitted and shall not be considered.

The selected MTBM shall include the following features, as a minimum:

a. A slurry shield MTBM shall be used for all tunneling work required for this Project. The machine shall be manufactured by a company that specializes in the design and fabrication of this type of equipment. The machine shall be capable of providing pressurized face support during both excavation and shutdown periods.
b. The machine shall be capable of exerting a controllable pressure against the face, during both excavation and shutdown periods, to support the excavation face, prevent groundwater inflows, and prevent loss of ground. Determine and submit for approval a safe range of slurry pressures at the face that are high enough to provide adequate face support and groundwater pressure resistance while low enough to prevent ground heave. The cutting wheel chamber shall be equipped with at least one operating, calibrated pressure cell with an accuracy that allows face pressure to be maintained within ±0.1 bar of the desired pressure during mining.
c. A slurry mixture and consistency shall be used that minimizes slurry migration into the ground and allows a slurry cake to develop for ground support. Slurry line density measurements and any other suitable devices shall be used to check against excess lost ground (over mining) by computing the rate of tunnel muck removed as a percentage of the theoretical excavated soil weight for each pipe jacked.
d. Pumps and intake and discharge piping shall be used that are compatible with the tunnel drive lengths, depths, soil types and machine advance rate anticipated. The slurry return lines shall consist of abrasion-resistant hoses with high pressure rating that can resist the abrasive cuttings of cobbles and boulders. The intake ports' size in the crushing chamber shall be adequate to allow for passing of all material sizes produced at the face. Select type and size of pump impellers to accommodate the anticipated cobble and boulder cuttings.
e. A surface separation plant shall be provided and equipped with screens, centrifuges, cyclones and settling tanks for efficient removal of muck (both coarse and fine-grained fractions) from the slurry at a rate compatible with the anticipated machine advance rate.
f. Tunneling equipment selected for the project shall be suitable for and capable of efficiently advancing through the geologic conditions described in the Geotechnical Baseline Report.
g. The MTBM shall have sufficient torque and speed for efficient operation through the anticipated ground conditions and shall be capable of being rotated clockwise and counter-clockwise to adjust for rolling effects. The machine's torque capacity shall be high enough to provide ability to mine through zones of cobbles and boulders.

h. The MTBM shall have a rock crusher, or similar means, capable of fracturing rocks up to at least 24 inches. The cutting wheel shall include a combination of disk cutters and other types of cutters that are designed for boulder fracturing and mining capability in the anticipated soil formations. The MTBM shall have interchangeable cutters. The contractor shall determine the cutter types and configuration.
i. The MTBM shall be sized to ensure compatibility with one-pass pipe jacking and the structural capacity of the jacked pipe support system. Skinned-up MTBM is not permitted.
j. The machine shall be steerable in both the vertical and horizontal directions to allow the operator to maintain line and grade within the specified tolerances.
k. The machine shall be equipped with a digital guidance system with continuous display of actual tunnel alignment vs. the design alignment.
l. The selected machine shall be able to withstand all loads and pressures that are likely to be encountered during tunneling operations without distress or excessive deformation. Shield, cutting wheel and other metal work in contact with moving soil or muck shall be suitably protected to minimize abrasion damage.
m. The machine shall have a uniform exterior surface from the leading edge to the trailing edge, and free of projections, except beads, that could produce over excavation or voids.
n. Total overcut around the jacked pipe, defined as the difference between the excavated diameter at the heading and the jacked pipe outside diameter, shall be less than 3 inches in diameter.
o. The tail of the machine shall have a sealing system and joint cushion that prevents ground and groundwater infiltration and pipe damage when thrusting or reacting against it.
p. The machine shall include monitoring and recording equipment sufficient for documentation of thrust forces, start and stop times, rate of advance, position (heading station and pitch), line and grade deviation, cutting head torque and speed, advancement thrust, face pressure, face standup time/stability, computed muck volume, ventilation and atmosphere monitoring data and any other pertinent information for each pipe advance or initial support set.
q. The machine shall be equipped with a ventilation and atmosphere control system capable of reducing and/or eliminating dust, vapors, fumes, and other atmospheric impurities.
r. The machine shall be equipped with a continuous monitoring system for noxious and explosive gases. Include audible and visual alarms at the end of the shield that will be triggered if threshold levels, as specified by OSHA, are reached at any point along the shield. The tunnel machine shall have an emergency shut-off switch or control in case noxious or explosive gasses are detected.
s. All of the various components and systems shall be new or refurbished to be like new with refurbishment certificate from the manufacture within one year prior to the tunnel excavation work specified herein.

B.5 Lubrication System
Provide a pipe lubrication system to inject bentonite slurry and/or polymer at the tunnel machine and pipe locations and in quantities as required to minimize pipe friction and jacking forces. Monitor and control pressures to prevent injection pressures at the pipe annulus from causing ground heave or "frac-out" (hydraulic fracturing) of the ground.

Only bentonite or polymers shall be used as pipe lubricant. Oil-based lubricant is prohibited.

Bentonite: Bentonite shall be high-swelling montmorillonite clay or other product as approved by the engineer.

Polymers: Polymers used as pipe lubricant or additive to bentonite shall be non-toxic.

B.6 Jacked Pipe
Pipe class and inside diameter of the jacked pipes shall be as per plans, and shall conform to standard spec 522.2.2 and ASCE 27-00 - Standard Practice for Direct Design of Precast Concrete Pipe for Jacking in Trenchless Construction. The selection of the pipes outside diameter shall be coordinated with the selected tunnel machine to maintain the total overcut around the pipe under the maximum allowed magnitude as specified herein. In case of conflict between standard spec 608.02 and ASCE 27-00, the most-stringent requirement shall apply.

Pipe to be jacked into place shall have minimum concrete compressive strength of 6,000 psi and have flush joints. No pipe shall be delivered to the jobsite until the concrete strength has reached 6,000 psi as determined by core samples taken and tested in accordance to AASHTO T 22 or manufacturer's certificate.

Each piece of pipe shall have one lubrication/grout port with threaded fittings at the crown and one lubrication/grout port with threaded fittings at each spring line for pressure grouting. Ports and fittings shall be attached to the pipe in a manner that will not materially affect the strength of the pipe. Each grout port shall have a one-way check valve and shall be 2-inch minimum diameter with plugs cast into the pipe at the time of manufacture. Plugs for sealing the fitting shall be capable of withstanding all external and internal pressures and loads without leaking. Pipe plugs shall provide resistance to corrosion equal to the pipe, coating, and lining.

C Construction
C.1 Submittals
C.1.1 General
Prepare and submit documentation of contractor's qualifications, shop drawings, and tunnel work plan at the preconstruction meeting or at least 21 calendar days prior to beginning tunnel construction, whichever date is earlier. The engineer will accept the submittal as submitted or return the submittal with requested revisions. Do not start any work until the engineer provides acceptance of the documentation of contractor's

qualifications, shop drawings and tunnel work plan. Acceptance of the submittals does not relieve the contractor of responsibility for successful completion of the tunnels.

C.1.2 Subsurface Conditions

The contractor shall review the Geotechnical Baseline Report – South Leg Storm Sewer – Manholes Z2822 to Z2431 (referred as "Geotechnical Baseline Report" herein) for the subsurface conditions.

C.1.3 Submittals for Approval

Documentation of Contractor's Qualifications: The contractor shall submit the project experience documentation and resumes of site engineers, superintendents, shifters, operators, and all other key personnel, meeting the qualifications delineated in the article of contractor's qualifications. The project experience documentation for each project must include a brief project description, detail the size and length of the tunnels, tunneling methods used during installation, local soil conditions, actual construction time and contact information consisting of an individual's name and current phone number. Contacts must be capable of verifying project participation. The resumes must contain a summary of each individual's experience and it must be complete enough for the engineer to determine whether each individual has satisfied the qualifications.

Shop Drawings: The contractor shall prepare and submit detailed shop drawings and pertinent descriptions, data and calculations for all items to be incorporated into the finished work. The Drawings and calculations shall show compliance to specified requirements and applicable codes and shall bear the seal, signature and date of a professional engineer registered in the State of Wisconsin. As a minimum, include the following:

a. A tunnel cross-section showing the theoretical excavation perimeter, based on the proposed tunneling equipment, and the proposed pipe inside and outside perimeters.
b. Pipe drawings which include reinforcement details, joint details, joint cushion materials, fabrication tolerances, and grout/lubrication port detail.
c. Design calculations demonstrating that the pipe is capable of sustaining the maximum stresses to be imposed during jacking in accordance to ASCE 27, Standard Practice for Direct Design of Precast Concrete Pipe for Jacking in Trenchless Construction. The axial strength of the selected pipe shall be designed based on a factor of safety of 2.5 or more against failure under the maximum anticipated jacking force. The calculations shall take into account maximum anticipated ground loads (earth, groundwater and surcharge pressure), live loads, jacking forces, eccentric forces due to steering, external loads such as traffic, and any other loads that may be reasonably anticipated. All loads shall be shown and described. Use the maximum allowable bearing stress criteria specified in this section.

d. Calculations showing the hydraulic pressure that is required to develop the maximum allowable jacking capacity for main jacks. A description of controls to ensure that the maximum allowable hydraulic pressure will not be exceeded during jacking operations. Calculations shall demonstrate that the soils behind the backstop (or thrust wall) will sustain the maximum forces developed by the main jacks.
e. Calculations showing anticipated face pressure and side resistance for the tunnel machine and pipe string.
f. Details of main jacking station.

Tunnel Work Plan: Prior to the start of work, the contractor shall submit a detailed work plan to the engineer. The work plan shall include descriptions indicating the proposed locations of shafts, facilities, and equipment to be utilized and describing the methods of construction. Items shall include, but are not limited to:

a. Tunneling Equipment:
    i. A detailed description of the methods and equipment to be used in completing the tunnel drive. Include a description of how the proposed equipment and operations will prevent loss of ground and surface heave during operations. This description should include procedures to handle face stability and groundwater inflow and should also include a plan for inspection of the ground conditions and removal of obstructions. Clearly state the maximum size of boulder or rock fragment that can be excavated and removed by the proposed tunnel machine and for the procedure and equipment to be used to fracture-split and excavate of any boulders or rock blocks encountered. The plan should provide details of proposed methods and procedures for excavating the tunnels, hauling and disposing of muck, ventilation, and illumination.
    ii. Manufacturer's literature describing the tunneling system including the tunneling and all ancillary equipment. Provide model number, shield and machine controls, shield dimensions and cut diameter, specifications, and operating procedures. Provide descriptions of projects on which this system has been successfully used, including names, addresses, and telephone numbers of owner's representatives for these projects as well as length, diameter, and pipe material used and the encountered ground condition. If a used or refurbished tunnel machine is proposed, submit manufacture's refurbishment certificate and list previous usage, modifications made and dates of modifications, and detailed description of the extent and dates of refurbishment.
    iii. Shop drawings showing propulsion system, safety systems, steering provisions, provisions for ground improvement, arrangement of the cutting tools, muck removal system and trailing components including muck conveyors. Include a description of how the breasting system functions and the methods to be used to maintain face pressure. Also include description of procedures for ensuring the support of the tunnel face if tunneling operations are interrupted.

iv. Hoisting plant (crane) for placement of tunnel, jacking equipment and pipe, and for muck removal.
v. Submit samples of automated tunneling records to be provided during tunneling. Samples shall include electronic data and any necessary programs to interpret data, and the manual logs or records to be used.
vi. Maintenance procedures and a list of spare parts to be maintained onsite.
vii. Description of procedures for tunnel machine demobilization and removal from the tunnel.
viii. Description of the alignment control systems including manufacturer's literature and drawings showing setup, support provisions, and other details for the laser guidance system. Submit a description of surveying methods to be used to set laser guidance system positions and a description of procedures to check and reset or realign guidance system during construction. Confirm that these systems can achieve the required pipeline line and grade within the specified tolerances.
ix. Details of spoil handling, transport, and disposal equipment and procedures including details of spoil additives, and the location of permanent spoil disposal sites. Confirm that spoils shall be contained at all times and shall not be stockpiled or dumped on site. Provide manufacturers description for any spoil additives and Material Safety Data Sheets (MSDS's). Provide written documentation from the disposal site(s) indicating that they will accept the spoil and are in compliance with applicable regulations.

b. Tunneling sequence plan.
c. Bulkhead placement and removal.
d. Details of the lubrication system and description of pipe lubricants to be used during pipe jacking.
e. Shaft Layout Drawings: The contractor shall submit shaft layout drawings detailing dimensions and locations of all equipment, including overall work area boundaries. Layout drawings will be required for tunnel launch and retrieval locations and shall be to scale, or show correct dimensions. The contractor's layout drawings shall show that all equipment and operations shall be completely contained within the allowable work areas shown on the drawings.
f. Safety Plan: The contractor shall prepare a Safety Plan for the tunneling operations. The plan shall be project-specific and shall include air monitoring equipment and procedures, and provisions for lighting, ventilation, and electrical system safeguards. Plan shall include incident response and tunnel/shaft rescue plan; hazard recognition; site safety analysis; tunnel and shaft access; flooding controls; and fire and explosion prevention. Plan shall also address ground support, communication, handling of materials and equipment, pressurized fluids and noise.
g. Contingency Plans: The following list includes problem scenarios that may be encountered during the tunneling operations. The contractor shall submit contingency plans for dealing with each problem scenario while satisfying the Specifications. These plans shall include the observations and measurements required to clearly identify the cause of the problems.

i. Tunnel machine unable to advance: Possible obstructions (including boulders, rock blocks, old foundations, metallic debris, or reinforced concrete).
ii. Cutter head or face support problems.
iii. Loss of cutter tools during tunnel drive.
iv. Strong hydrocarbon smell detected in the spoils or in the shaft.
v. Laser distorted by heat, humidity, or physical disturbance.
vi. Ground heave, settlement and/or subsidence.
vii. Steering difficulties resulting in line and grade tolerances being exceeded.
viii. Loss of control, or inability to monitor position, thrust, or other performance parameters.
ix. Inflow of large volumes of water, threatening face stability.

C.1.4 Information Submittals

Prior to Each Tunnel Drive: Submit the results and field notes of line and grade survey to the engineer at least 24 hours prior to the start of each drive to ensure that the thrust block, jacking frame, guide rails, entry and exit eyes are installed properly.

Tunnel Daily Records: Submit the following daily records to the engineer by noon on the day following the shift for which the data or records were taken.

a. Tunneling Records: The contractor shall provide complete tunneling records to the engineer. These records shall include, at a minimum: date, time, name of operator, tunnel drive identification, installed ground support element number and corresponding tunnel length, rate of advance, jacking forces, excavated muck rates and volumes, total muck volume to date, changed face conditions encountered, lubrications, steering jack positions, line and grade offsets, any movement of the guidance system, shield inclination and roll, problems encountered with the tunnel machine or other components or equipment, and durations and reasons for delays. Computer-recorded data if used should be referenced to time and distance and should be recorded at time intervals of 1 minute. Manually recorded observations should be made at intervals of not less than once per ground support element, as conditions change, and as directed by the engineer.
b. Survey Measurements: Survey measurements of tunnel alignment and all surface and subsurface settlement monitoring points.

C.1.5 Acceptance

The engineer will evaluate the Submittals for Approval with the requirements of this special provision. Within 14 calendar days after receipt of the Submittals of Approval, the engineer will notify the contractor of the acceptance of the submittal, or if additional information and/or changes are required. Any unacceptable part of the Submittals of Approval will require resubmission. The contractor must resubmit the Submittals of Approval for evaluation and review with the necessary changes or additional information provided. The engineer will provide a written notice of acceptance or rejection of contractor's resubmitted Submittal for Approval within 14 calendar days after its receipt.

After the engineer's acceptance of Submittal of Approval, no changes to the Submittal of Approval can be made without written consent of the engineer.

All Information Submittals should be submitted to the engineer. The engineer can reject the submittals which do not adequate detail, as required herein. The contractor shall resubmit the rejected submittals within 7 days upon the receipt of the engineer's rejection notice.

C.2 Tunnel Excavation

Construct pipeline by one-pass tunneling methods that provide jacked reinforced concrete pipe, or other type of lining as permitted by the engineer, subject to the restrictions on methods stated elsewhere in this special provision. The acceptable tunneling method shall be tunnel excavation by a slurry shield MTBM. Blasting is not permitted anywhere on the Project.

The contractor shall complete tunnel excavation by the tunnel machine in accordance to approved Submittals and all applicable permit conditions, and provide all temporary electrical, water, telephone, and other facilities required to complete the tunnel. Detailed construction sequencing shall be the responsibility of contractor, consistent with the requirements of this special provision.

The contractor's selection of means and methods for excavation is integral to the planning and execution of the work of the project as specified. The selection of means and methods is the responsibility of the contractor and the selected means and methods shall be capable of coping with subsurface conditions encountered. Excavation shall include removal of excavated material to the ground surface. Loading, conveying, dumping, and disposal of excavated materials from the shafts and tunnel off the construction site shall be as specified herein.

Tunnel excavation by the tunnel machine shall not begin until the following tasks have been completed:

a. All required submittals have been provided, reviewed, and approved.
b. Shaft excavation, stabilization and shoring have been satisfactorily completed in accordance to special provisions, article Shaft Excavation Support System.
c. Groundwater control has been implemented as per special provisions, article Control of Water.
d. Survey control has been established for the tunnel.
e. All required geotechnical instrumentation had been properly installed and baseline readings taken, as per special provisions, article Geotechnical Instrumentation.
f. A startup inspection of all mechanical and hydraulic systems associated with the tunneling operations has been completed. The system shall be tested on the surface to ensure that the machine and supporting equipment is functioning properly. The engineer shall be notified at least 72 hours prior to the start-up inspection and will be present during the start-up inspection. Key machine performance data shall be measured and recorded by the contractor during this

inspection, including face support components, functionality of main and steering jacks, laser and target, and other components. The records of the start-up inspection shall be submitted to the engineer within 24 hours of the completed inspection.

g. Site safety representative has prepared a code of safe practices and an emergency plan in accordance to OSHA and other applicable requirements. Provide the engineer with a copy of each prior to starting tunneling. Hold safety meetings and provide safety instruction for new employees as required by OSHA. Conduct a preconstruction safety conference in accordance to OSHA requirements. Arrange this conference and inform the engineer of the time and place of the conference at least 7 days in advance.

Perform tunnel excavation in a manner that will minimize the movement of the ground in front of and surrounding the excavation, and minimize subsidence of the surface, structures, and utilities above and in the vicinity of the excavation. Support the ground in a manner to prevent loss of ground and keep the perimeters and faces of the tunnel, passages, and bottoms of work shafts stable. Support the face of the excavation by during all shut down periods.

Excavation shall be to the lines, grades, and dimensions shown on the plans and shop drawings. Excavation shall not extend beyond the theoretical excavation line shown on the shop drawings. Methods shall be used and precautions shall be taken to minimize removal of loosening, and raveling of material beyond the minimum excavation necessary to satisfy all criteria. The contractor shall provide means to accurately measure the quantity of ground removed from the tunnel. After each tunnel drive, fill the annular space outside the pipe with grout as per special provisions, article Contact Grouting.

Do not advance the tunnel machine at any time when the tunnel guidance system is out of order. Validate line and grade continually with survey control by the qualified surveyor. Line and grade shall be validated at the frequency no less than once per installation of each pipe segment. The tunnel horizontal and vertical tolerances shall be plus-or-minus 1 inch. When a variation from specified line or grade occurs, immediately take action to return the excavation within the specified design line and grade.

Completely contain, transport, and dispose of all excavated materials and additives away from the construction site. Space for stockpiling is limited and may not be available at the work site. All spoils must be contained in trucks, tanks, or other containers at all times. Dumping of spoil on the ground, discharge into sewers or ditches, or discharge into the shafts is not permitted. Only use the disposal sites identified in approved submittals for muck and spoil disposal.

Spare parts shall be available for delivery to the site within 5 days in the event that replacement is necessary.

When the boulders cannot be split or broken by the cutterhead into a size that can be ingested through muck handling system, the contractor shall be prepared to provide other methods of removing the boulders.

At the end of each tunnel drive, the contractor shall examine the wear-and-tear condition of each cutting tools equipped on the cutterhead. The contractor shall promptly change the damage and severely worn cutter tool at the end of each tunnel drive to prevent changing cutter tools during the tunnel drive.

C.3 Pipe Jacking

The contractor shall follow the direction of Pipe Jacking between the shafts as recommended in the Geotechnical Baseline Report. The contractor shall minimize loss of lubricant, or soil into the shaft at the pipe penetration.

Set the pipe to be jacked on properly braced and supported pipe guide rails. The axial forces from the thrust jacks shall be distributed to the pipe uniformly through cushion material to prevent damage to the ends of the pipe. Control the advance rate and the volume of material excavated to avoid over-excavation and heave.

Total jacking capacity, provided by the main jack and intermediate jacking station(s) if used, shall have a minimum factor of safety of 1.5 against the jacking force. Control jacking pressures so as not to exceed to the maximum allowable jacking capacity and the maximum jacking pressure of pipe. The contractor shall install intermediate jacking station(s) as needed prevent damage to the pipe and jacking/thrust block system and to prevent the tunnel machine and pipe string from becoming stuck due to side friction.

Each pipe section shall be jacked as the excavation progresses in such a way that leaves no length of tunnel exposed at any time. Use anti-reverse thrust restraints to prevent pipe movement into launching shaft when jacking retracted for placement of a new pipe.

Pipes shall be jacked into place without damaging the pipe. In the event a section of pipe is damaged during the jacking operation, the pipe shall be jacked through to the receiving shaft and removed. Other methods of repairing the damaged pipe may be used, subject to approval by the engineer.

The thrust block at the launching shaft shall be properly designed and constructed to provide a minimum factor of safety of 1.5 against the maximum possible thrust by the main jacks. The thrust block shall be aligned with the proposed pipe alignment and shall be designed to withstand the maximum allowable jacking pressure to be used, without excessive deflection or displacement.

C.4 Lubrication

Apply lubrication to the external surface of the pipe to reduce skin friction and the annular space created by the overcut shall be filled with a lubricant suitable for the particular soil conditions to be tunneled.

Provide a lubrication system to inject an approved lubricant at the rear of the tunnel machine and as required along the pipe length to lower the friction developed on the sides of the pipe during jacking. The lubrication system shall be such that it can automatically be controlled from the operator's cabin and controlled volumes of lubricant can be injected by the operator at selected locations along the tunnel. Such volumes of lubricant pumped, including the location of injection, shall also be automatically recorded.

Monitor at all times the volumes, pressures, and location of grout/lubrication injection points to ensure that the annulus around the pipe is completely filled with approved lubricant.

C.5 Air Quality

Perform all shaft and tunnel excavation operations by methods and with equipment which will reduce or eliminate any dust, fumes, vapors, gases, fibers, fogs, mists or other atmospheric impurities. Conform to regulations promulgated by OSHA and other regulatory authorities regarding air quality and ventilation in excavations. Provide appropriate instruments for testing the quality of the tunnel atmosphere and take samples under working conditions, all in accordance to OSHA, District of Columbia, or other jurisdictional requirements.

Continuous gas monitoring shall be conducted at all times personnel are underground.
Air testing shall be required for the specific conditions to ensure the gas concentration requirements as per OSHA 29 CFR 1926.55 are met.

C.6 Tunnel Ventilations

As a minimum, when the excavations are occupied by workmen, the main ventilation system should deliver fresh air to the face at a volumetric flow rate equal to 60 feet per minute times the full area of the excavated face. A higher volumetric flow rate should be provided if necessary to conform to OSHA requirements. Operate the tunnel main ventilation system 24 hours per day, 7 days per week, continuously, until hole-through. During extended periods of inactivity when excavations are unoccupied, such as over weekends or holidays, the volumetric flow rate may be reduced to the OSHA minimums.

C.7 Tunnel and Shaft Illumination

Light in all areas where work is in progress shall be adequate to permit proper observation of operations by the contractor and the engineer at all times. Lighting intensity shall be as required by applicable regulations for tunnel and shaft construction operations. Lighting intensity shall be increased as required by the engineer for concrete placement and inspection and for final cleanup.

Open flame lights shall not be used. Flashlights shall be explosion-proof. Both power and lighting circuits shall be separated and thoroughly insulated. The voltage shall not exceed 115 volts. All lights shall be placed in porcelain light fixtures in vapor tight enclosures and metal guards. Lighting installation shall conform to National Electric Code NFPA 70.

Maintain underground illumination in place throughout the life of the Contract including the substantial completion inspection or until permission to remove illumination is received in writing from the engineer.

C.8 Emergency Measures
Whenever there is a condition which is likely to endanger the stability of the excavation or adjacent structures, the contractor shall operate with a full crew for 24 hours a day including weekends and holidays without intermission until those conditions no longer jeopardize the stability of the work and adjacent facilities.

Emergency electric power supply shall be provided by the contractor and shall be independent of the primary electric supply. The emergency power system shall be capable of powering the excavation lighting, ventilation and water control systems and, if used, the low pressure compressed air system.

C.9 Cleanup
After completion of tunneling and pipeline installation, all construction debris, spoils, oil, grease, and other materials will be removed from the tunneled pipe, launch and retrieval shafts, and all contractor work areas. Cleaning shall be incidental to the construction. No separate payment shall be made for cleanup.

D Measurement
The department will measure Tunnel Excavation by the linear foot. The number of linear feet of Tunnel Excavation will be based on the plan quantity (length) without measurement. Longer pipe and additional excavation beyond the limits of the plan dimensions will not be measured for payment unless authorized and agreed to in advance of placement by the department.

E Payment
The department will pay for plan quantities or revised plan quantities if agreed to in advance of placement by the department, at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.8096	Tunnel Excavation	LF

Payment for Tunnel Excavation is full compensation for completing tunnel work, including, but not limited to, tunneling, boulder removal (which do not impede the defined normal forward progress of the tunnel machine), concrete pipe size and class as specified in the plan with delivery and jacked pipe installation, lubrication, contact grouting, documentation, all materials, labors, equipment's, tools, handling, transporting, disposing spoils, equipment mobilization/demobilization, and all other necessary incidental items as specified in this special provision.

353. Survey Project 1060-33-80, Item SPV.0105.0001.

A Description
Perform work according to standard spec 105.6 and 650 and as hereinafter modified.

This special provision describes modifying standard specs 105.6 and 650 to define the requirements for construction staking for this contract.

Replace standard spec 105.6.2 with the following:

The department will not perform any construction staking for this contract. Obtain engineer's approval prior to performing all survey required to lay out and construct the work under this contract.

The survey includes establishing horizontal and vertical position for all aspects of construction including but not limited to storm sewer, subgrade, base, curb, gutter, curb and gutter, pipe culverts, drainage structures, structure layout, bridges, noise barriers, all retaining wall layout, pavement, barriers (temporary and permanent), overhead signs, freeway and local street lighting, electrical installations, supplemental control, slope stakes, ponds, traffic signals, ITS, FTMS, parking lots, paths, utilities, conduit, water main, sanitary sewer, booster stations, landscaping elements, irrigation system layout, installation of community sensitive design elements, traffic control items, fencing, etc.

The department may choose to perform quality assurance surveys during the project. These quality assurance surveys do not relieve the responsibility for performing all survey work required to lay out and construct the work under this contract.

Delete standard spec 650.1.

B (Vacant)

C Construction
Conform to standard spec 650.3 and as modified in this special provision.

Add the following to standard spec 650.3.1 (5):

5. Storm Sewer layout horizontal or vertical locations.

Replace standard spec 650.3.1(6) with the following:

Maintain neat, orderly, and complete survey notes, drawings, and computations used in establishing the lines and grades. Make the survey notes and computations available to the engineer within 24 hours as the work progresses.

Replace standard spec 650.3.3.1 with the following:

Under the Survey Project bid item, global positioning system (GPS) machine guidance for conventional subgrade staking on all or part of the work may be substituted. The engineer may require reverting to conventional subgrade staking methods for all or part of the work at any point during construction if, in the engineer's opinion, the GPS machine guidance is producing unacceptable results.

Replace standard spec 650.3.3.3.4.1 with the following:

The department will provide the contractor staking packet as described in the Construction and Materials Manual (CMM) 7.10. At any time after the contract is awarded, the available survey and design information may be requested. The department will provide that information within five business days of receiving the contractor's request. The department incurs no additional liability beyond that specified in standard specification 105.6 or standard spec 650 by having provided this additional information.

Add the following to standard spec 650.3.3.3.6.2:

Record all subgrade elevation checks and submit a hard copy to the engineer within 24 hours or as requested by the engineer.

Add the following to the standard spec:

650.3.14 Water Main
Record all elevation data for the casing, grade breaks, water main pipe, bends, fittings, and all information necessary to accurately record the construction document. Submit a hard copy to the engineer within 24 hours or as requested by the engineer.

Set and maintain construction stakes or marks as necessary to achieve the required accuracy and to support the method of operations. Locate all pipe, valves and bends to within 0.25 feet horizontal and establish the elevations to within 0.10 feet vertically.

Set construction stakes at all water main valves, fittings and bends and at maximum interval of 50 feet for water main piping.

Provide the as-built xyz coordinates and elevations, in the project horizontal and vertical datum, of all bends, fitting, valves and tie in locations for the as-built plan. Also provide the locations of the casing ends, the elevation of the top of casing and the size and material of all pipes.

D Measurement
Replace standard spec 650.4 with the following:

The department will measure Survey Project 1060-33-80 as a separate single lump sum unit of work, acceptably completed.

E Payment
Replace standard spec 650.5 with the following:

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0001	Survey Project 1060-33-80	LS

The department will not make final payment for any staking item until the contractor submits all survey notes and computations used to establish the required lines and grades to the engineer within 21 days of completing this work. The department will deduct from payments due the contractor for the additional costs specified in standard spec 105.6.

Payment is full compensation for performing all survey work required to lay out and construct all work under this contract. No additional payments will be made for restaking due to construction disturbance and knock-outs.

354. Pavement Cleanup Project 1060-33-80, Item SPV.0105.0002.

A Description
This special provision describes cleanup of dust and debris from pavements within and adjacent to the job site.

B Materials
B.1 Pavement Cleanup
Furnish a vacuum-type street sweeper equipped with a power broom, water spray system, and a vacuum collection system.

Vacuum equipment shall have a self-contained particulate collector capable of preventing discharge from the collection bin into the atmosphere.

Use a vacuum-type sweeper as the primary sweeper, except as specified herein or approved by the engineer.

C Construction
C.1 Pavement Cleanup
Keep all pavements, curb lanes and gutters both closed and open to public traffic within the job-site boundaries free of dust and debris generated from any activity under the contract. Keep all pavements, curb lanes and gutters adjacent to the project free of dust and debris that are affected by land disturbing, dust generating activities, as defined in the contractor's dust control implementation plan.

Provide surveillance to identify if material is being tracked from the jobsite. Clean up spillage and material tracked from the project within an hour of occurrence or as directed by the engineer. Perform cleanup operations in a safe manner.

Provide routine sweeping of all pavements, curb lanes and gutters on local street active haul routes a minimum of once a day as defined in the Dust Control Implementation Plan (DCIP) or as directed by the engineer. Include the following roadways for routine sweeping:

- W. Greenfield Avenue (STH 100 to S. 84th Street)
- W. Schlinger Avenue (S. 100th Street to S. 84th Street)
- W. Adler Street (S. 95th Street to S. 84th Street)
- W. Kearney Street (S. 84th Street to S. 68th Street)
- W. Chester Street (S. 94th Place to S. 89th Street)
- W. O'Connor Street (S. 84th Street to S. 68th Street)
- W. Fairview Avenue (Oak Leaf Trail to N. 121st Street)
- W. Bluemound Road (N. 121st Street to S. 68th Street)
- W. Wisconsin Avenue (STH 100 to N. 95th Street)
- W. Watertown Plank Road (STH 100 to USH 45 northbound Exit Ramp)
- Oak Leaf Trail (IH 94 to W. Fairview Avenue)
- N. 121st Street (IH 94 to W. Bluemound Road)
- Colder's Service Road (STH 100 to Hank Aaron State Trail)
- STH 100 (W. Greenfield Avenue to W. Watertown Plank Road)
- N. 97th Street (W. Bluemound Road to W. Wisconsin Avenue)
- N. 95th Street (W. Bluemound Road to W. Wisconsin Avenue)
- S. 94th Place (W. Schlinger Avenue to Hank Aaron State Trail)
- S. 92nd Street (W. Schlinger Avenue to W. Bluemound Road)
- S. 84th Street (W. Greenfield Avenue to W. Bluemound Road)
- S. 76th Street (W. Kearney Street to W. Bluemound Road)
- S. 70th Street (W. Kearney Street to W. O'Connor Street)
- S. 68th Street (W. Kearney Street to W. Bluemound Road)
- And any other roadways approved by the department

In addition to routine sweeping, conduct sweepings as the engineer directs or approves, to deal with dust problems that might arise during off-work hours or emergencies. Provide the engineer with a contact person available at all times to respond to requests for emergency sweeping. Respond to emergency sweeping requests within 4 hours.

If the vacuum-type sweeper breaks down, a mechanical broom sweeper may be substituted for no more than 24 hours total elapsed time. Repair the vacuum-type sweeper within that 24 hours or substitute a vacuum-type sweeper.

Skid steers with mechanical power brooms may only be utilized on sidewalks and driveways whose pavements will not support the weight of a street sweeper, unless otherwise approved by the engineer.

D Measurement

The department will measure Pavement Cleanup Project 1060-33-80 as a single lump sum unit of work, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0002	Pavement Cleanup Project 1060-33-80	LS

Payment schedule for this item will be in accordance to the percentage of contract value earned.

Payment is full compensation for surveillance, mobilization, sweeping, disposing of materials and any other labor, tools or equipment necessary to complete the work.
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355. Concrete Pavement Joint Layout, Item SPV.0105.0003.

A Description
This special provision describes providing a concrete pavement or concrete base joint layout design for intersections and marking the location of all joints in the field.

B (Vacant)

C Construction
Plan and locate all points necessary to establish the horizontal position of the transverse and longitudinal joints in the concrete to prevent uncontrolled cracking. Submit a joint layout design to the engineer before paving each intersection. Mark the location of all concrete joints in the field. Follow the plan details for joints in concrete making adjustments as required to fit field conditions.

D Measurement
The department will measure Concrete Pavement Joint Layout as a single lump sum unit of work for all joint layout designs and marking, acceptably completed under the contract.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0003	Concrete Pavement Joint Layout	LS

Payment is full compensation for providing the intersection joint layout designs and marking all joints in the field.

The department will adjust pay for crack repairs as specified in standard spec 415.5.3.

356. Removing Geodetic Survey Monument 2X03, Item SPV.0105.0010.

A Description

This special provision describes removing the concrete Height Modernization Geodetic Survey Monument 2X03 located on the concrete portion of the median strip of the W. Wisconsin Avenue bridge over USH 45 in the top of the west bridge abutment at Station 29WX+02.82, 8.22' LT and salvaging the 3.5-inch bronze disc on top of the monument as shown on the plans and in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided. The monument is concrete that is approximately 16-inches in diameter and 8 feet deep. The bronze disc to be salvaged for department use is embedded in the concrete.

B (Vacant).

C Construction

Remove the concrete height modernization geodetic survey monument and salvage the bronze disc and return to the department in accordance to standard spec 204.3.

Notify the Milwaukee County Surveyor and Thomas Lipsky, RLS Wisconsin DOT/SE Region-Waukesha Survey Coordinator five working days prior to construction operations that may disturb existing monument, with pertinent questions or to return salvaged bronze disc to the department. Thomas Lipsky can be reached at (262) 548-6737 or (414) 750-1508, or email Thomas.Lipsky@dot.wi.gov.

D Measurement

The department will measure Removing Geodetic Survey Monument 2X03 as a single complete lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0010	Removing Geodetic Survey Monument 2X03	LS

Payment is full compensation for removing concrete geodetic survey monument, proper disposal of all materials, salvaging 3.5-inch bronze disc and returning it to the department, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

357. Removing Geodetic Survey Monument Milwaukee GPS AZ Mark, Item SPV.0105.0011.

A Description

This special provision describes removing the concrete Geodetic Survey Monument Milwaukee GPS AZ Mark located east of USH 45 in the grass area approximately 67' north of the W. Wisconsin Avenue pavement edge at Station 31WX+72.35, 111.07' LT and

salvaging the 3.5-inch bronze disc on top of the monument as shown on the plans and in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided. The monument is concrete that is approximately 16-inches in diameter and 8 feet deep. The bronze disc to be salvaged for department use is embedded in the concrete.

B (Vacant).

C Construction
Remove the concrete height modernization geodetic survey monument and salvage the bronze disc and return to the department in accordance to standard spec 204.3.

Notify the Milwaukee County Surveyor and Thomas Lipsky, RLS Wisconsin DOT/SE Region-Waukesha Survey Coordinator five working days prior to construction operations that may disturb existing monument, with pertinent questions or to return salvaged bronze disc to the department. Thomas Lipsky can be reached at (262) 548-6737 or (414) 750-1508, or email Thomas.Lipsky@dot.wi.gov.

D Measurement
The department will measure Removing Geodetic Survey Monument Milwaukee GPS AZ Mark as a single complete lump sum unit of work, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0011	Removing Geodetic Survey Monument Milwaukee GPS AZ Mark	LS

Payment is full compensation for removing concrete geodetic survey monument, proper disposal of all materials, salvaging 3.5-inch bronze disc and returning it to the department.

358. Removing Playground, Item SPV.0105.0015.

A Description
This special provision describes completely removing the existing playground and equipment located east of Ramp BB between Station 818BB+24 and Station 818BB+75, 2’ LT to 39’ RT and disposing of all resulting materials in accordance to the plans, standard specifications, and as hereinafter provided.

B Materials
Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material as directed by the engineer.

C Construction
At least five business days prior to the start of Removing Playground, contact the property owner to arrange for the removal of salvaged materials. Allow up to five business days for the property owner to remove and salvage materials.

Perform work in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

Carefully disassemble and completely remove all playground equipment. Remove all materials below existing ground to an elevation of 5 feet below proposed surface elevation, or as specified by the engineer. Dispose of all removed material at an offsite location including but not limited to playground equipment, swings, chains, pipes, bolts, fasteners, concrete foundations, mulch, plastic, wood, steel, and borders.

Backfill all excavations, holes, and voids not occupied by other work under this contract in accordance to standard spec 204.3.1.2.

D Measurement
The department will measure Removing Playground as a single lump sum unit of work, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0015	Removing Playground	LS

Payment is full compensation for breaking down and removing playground equipment and concrete foundations as outlined in this specification; for contacting the property owner to arrange for the removal of salvaged materials; for furnishing all excavating; for furnishing, placing, and compacting Backfill Granular; and for hauling and disposing of all materials.

359. Removing Weather Station Chester Street, Item SPV.0105.0016.

A Description
This special provision describes completely removing the existing City of Milwaukee weather station located in the southwest quadrant of the Chester Street intersection with 92nd Street between Station 48CH+93 and Station 49CH+15, 43’ RT and disposing of all debris and resulting materials in accordance to standard spec 204, and as hereinafter provided.

The weather station includes a metal framework tower, two meter pedestals, and a power cabinet.

B Materials
Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material.

C Construction

C.1 General

The City of Milwaukee will salvage materials from the existing weather station. At least 30 working days prior to the start of Removing Weather Station Chester Street, notify Mr. Thomas Tarkowski, at (414) 286-3295, to arrange for power disconnection and the removal of salvaged items and materials by the City of Milwaukee. Anticipate up to three days for city forces to disconnect, remove, and salvage materials. Begin Removing Weather Station Chester Street after the City of Milwaukee has finished salvaging materials.

C.2 Removal

Perform work in accordance to standard spec 204 and as hereinafter provided. The contractor is responsible for the safe methods and sequence of controlled removal operations.

Safely disconnect and remove electrical appurtenances. Entirely remove from the site all materials not salvaged by the City of Milwaukee including but not limited to bolts, wires, tower framework, foundations, meters, pedestals, cabinets, antennas, gauges, and controls. Excavate as required to remove the weather station components from the ground.

Dispose of all removed material at an offsite location. Do not disturb adjacent property. All materials generated during removal activities are the property of the contractor.

C.3 Backfill

Backfill exposed openings not occupied by other work under this contract in accordance to standard spec 204.3.1.2.

C.4 Protecting the Site

At the end of each day's work, leave site in a safe and secure condition so that no part of the existing weather station is in danger of toppling or falling and unauthorized admittance is prohibited. Furnish and erect suitable fencing around the exposed openings resulting from excavation, to protect and safeguard the public from all hazardous conditions created by the operations. Remove the fencing after all open excavations have been backfilled satisfactorily and approved by the engineer.

D Measurement

The department will measure Removing Weather Station Chester Street as a single complete lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0016	Removing Weather Station Chester Street	LS

Payment for Removing Weather Station Chester Street is full compensation for furnishing all excavating; for contacting the City of Milwaukee to coordinate the removal of salvaged materials; for furnishing all removals including but not limited to bolts, wires, tower framework, foundations, meters, pedestals, cabinets, antennas, gauges, and controls; for furnishing, placing, and compacting Backfill Granular; for disposing of all removed materials including loading, transporting, and unloading; for restoring the work site; for furnishing, installing and removing fencing and all other items as required for proper protection of the site.

360. Removing Weather Station Zoofari Center, Item SPV.0105.0017.

A Description

This special provision describes completely removing remnants of an existing WDNR weather station located near the Zoofari Center at approximately Station 718BC+60, 12' RT and disposing of all debris and resulting materials in accordance to standard spec 204, and as hereinafter provided.

The weather station remnants include concrete foundations, a meter pedestal, and power cabinet.

Removing existing fence will be paid for under a separate item.

B Materials

Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material.

C Construction

C.1 Removal

Perform work in accordance to standard spec 204 and as hereinafter provided. The contractor is responsible for the safe methods and sequence of controlled removal operations.

Safely remove electrical appurtenances. Entirely remove from the site all materials including but not limited to bolts, wires, concrete foundations, concrete blocks, paving blocks, conduit, meters, pedestals, cabinets, antennas, gauges, and controls. Excavate as required to remove the weather station remnants from the site.

Dispose of all removed material at an offsite location. Do not disturb adjacent property. All materials generated during removal activities are the property of the contractor.

C.2 Backfill

Backfill excavations not occupied by other work under this contract in accordance to standard spec 204.3.1.2.

C.3 Protecting the Site
At the end of each day's work, leave site in a safe and secure condition. Furnish and erect suitable fencing around the exposed openings resulting from excavation, to protect and safeguard the public from all hazardous conditions created by the operations. Remove the fencing after all open excavations have been backfilled satisfactorily and approved by the engineer.

D Measurement
The department will measure Removing Weather Station Zoofari Center as a single complete lump sum unit of work, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0017	Removing Weather Station Zoofari Center	LS

Payment for Removing Weather Station Zoofari Center is full compensation for furnishing all excavating; for furnishing all removals including but not limited to bolts, wires, concrete foundations, concrete blocks, paving blocks, conduit, meters, pedestals, cabinets, antennas, gauges, and controls; for furnishing, placing, and compacting Backfill Granular; for disposing of all removed materials including loading, transporting, and unloading; for restoring the work site; and for furnishing, installing and removing fencing and all other items as required for proper protection of the site.

361. Moving Sign Bridge Cantilevered S-40-379, Item SPV.0105.0100; Moving Sign Bridge Cantilevered S-40-133, Item SPV.0105.0101; Moving Sign Bridge Cantilevered S-40-310, Item SPV.0105.0102.

A Description
This special provision describes removing and relocating existing sign bridge cantilevered S-40-379, S-40-133 and S-40-310, as shown on the plans.

B (Vacant)

C Construction
Perform work in accordance to standard spec 641.3. Existing concrete bases, including anchor bolts, reinforcing steel, and conduit shall be removed to a minimum depth of 4 feet below the adjacent finished grade. Removed portions of the concrete foundations shall be disposed of outside the highway right-of-way in accordance to standard spec 204.

D Measurement
The department will measure Moving Sign Bridge Cantilevered S-40-379, Moving Sign Bridge Cantilevered S-40-133 and Moving Sign Bridge Cantilevered S-40-310 as a single lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0100	Moving Sign Bridge Cantilevered S-40-379	LS
SPV.0105.0101	Moving Sign Bridge Cantilevered S-40-133	LS
SPV.0105.0102	Moving Sign Bridge Cantilevered S-40-310	LS

Payment is full compensation for removing, transporting and erecting the sign bridge, including signs, lighting and catwalk; removing existing concrete bases; for providing anchor bolts, but not including concrete supports paid for separately.

362. Railing Tubular Steel Galvanized Pedestrian South Wall, Item SPV.0105.0905.

A Description

This special provision describes fabricating, galvanizing, painting and installing railing in accordance to standard specs 506, 513 and 517 and the plan details, as directed by the engineer, and as hereinafter provided.

B Materials

All materials for railing shall be new stock, free from defects impairing strength, durability and appearance. Railing assemblies shall be galvanized and receive a two-coat paint system. Bubbles, blisters and flaking in the coating will be a basis for rejection.

B.1 Coating System

B.1.1 Galvanizing

After fabrication, blast clean steel railing assemblies per SSPC-SP6 and galvanize according to ASTM A123. Vent holes shall be drilled in members as required to facilitate galvanizing and drainage. Location and size of vent holes are to be shown on the shop drawings. All burrs at component edges, corners and at holes shall be removed and sharp edges chamfered before galvanizing. Condition any thermal cut edges before blast cleaning by shallow grinding or other cleaning to remove any hardened surface layer. Remove all evident steel defects exposed in accordance to AASHTO M 160 prior to blast cleaning. Lumps, projections, globules, or heavy deposits of galvanizing, which will provide surface conditions that when painted, will produce unacceptable aesthetic and/or visual qualities, will not be permitted.

B.1.2 Two-Coat Paint System

After galvanizing, paint all exterior surfaces of steel railing assemblies and inside of rail elements at field erection and expansion joints as hereinafter provided. All galvanized surfaces to be painted shall be cleaned per SSPC-SP1 to remove chlorides, sulfates, zinc salts, oil, dirt, organic matter and other contaminants. The cleaned surface shall then be brush blast cleaned per SSPC-SP16 to create a slight angular surface profile per manufacturer's recommendation for adhesion of the tie coat. Blasting shall not fracture the galvanized finish or remove any dry film thickness. After cleaning, apply a tie coat from

an approved coating system that is specifically intended to be used on a galvanized surface, per manufacturer's recommendations. The tie coat shall etch the galvanized rail and prepare the surface for the top coat. Apply a top coat per manufacturer's recommendations, matching the specified color shown on the plans. Use a preapproved top coat that is resistant to the effects of the sun and is suitable for a marine environment. The tie and top coats should be of contrasting colors, and come from the same manufacturer.

Ensure that the paint manufacturer reviews the process to be used for surface preparation and application of the paint coating system with the paint applier. The review shall include a visit to the facility performing the work if requested by the paint manufacturer. Provide written confirmation, from the paint manufacturer to the engineer, that the review has taken place and that issues raised have been addressed before beginning coating work under the contract.

Use one of the qualified paint manufacturers and products given below. An equivalent system may be used with the written approval of the engineer.

Manufacturer	**Products**	**Dry Film Minimum Thickness (mils)**	**Min. Time[1] Between Coats (hours)**
Sherwin Williams 1051 Perimeter Drive Suite 710 Schaumburg, IL 60173 (847) 330-1562	Recoatable Epoxy Primer B67-5 Series / B67V5	2.0 to 4.0	6
	Acrolon 218 HS Polyurethane, B65-650	2.0 to 4.0	NA
Carboline 350 Hanley Industrial St. Louis, MO 63144 (314) .644-1000	Rustbond Penetrating Sealer FC	1	36
	Carboguard 60	4.0 to 6.0	10
	Carboguard 635	4.0 to 6.0	1
	Carbothane 133 LH(satin)	4	NA
Wasser Corporation 4118 B Place NW Suite B Auburn, WA 98001 (253) 850-2967	MC-Ferrox B 100	3.0 to 5.0	8
	MC-Luster 100	2.0 to 4.0	NA

PPG Protective and Marine Coatings P.O. Box 192610 Little Rock, AR 72219-2610 (414) 339-5084	Amercoat 399	3.0 to 5.0	3
	Amercoat 450H	2.0 to 4.0	NA

[1] Time is dependent on temperature and humidity. Contact manufacturer for more specific information.

B2 Shop Drawings

Submit shop drawings showing the details of railing construction. Show the railing height post spacing, rail location, weld sizes and locations and all dimensions necessary for the construction of the railing. Show location of shop rail splices, field erection joints and expansion joints. State the name of the paint manufacturer and the product name of the tie coat and top coat used along with the color. State the size and material type used for all components. Also show the size and location of any vent or drainage holes provided.

C Construction

C.1 Delivery, Storage and Handling

Deliver material to the site in an undamaged condition. Upon receipt at the job site, all materials shall be thoroughly inspected to ensure that no damage occurred during shipping or handling and conditions of materials is in conformance with these specifications. If coating is damaged, contractor shall repair or replace railing assemblies to the approval of the engineer at no additional cost to the Owner. Carefully store the material off the ground to ensure proper ventilation and drainage. Exercise care so as not to damage the coated surface during railing installation. No field welding, field cutting or drilling will be permitted without the approval of the engineer.

C.2 Touch-up and Repair

For minor damage caused by shipping, handling or installation to coated surfaces, touch-up the surface in conformance with the manufacturer's recommendations. If damage is excessive, the railing assembly shall be replaced at no additional cost to the Owner. The contractor shall provide the engineer with a copy of the manufacturer's recommended repair procedure and materials before repairing damaged coatings.

D Measurement

The department will measure Railing Tubular Steel Galvanized Pedestrian South Wall as a single lump sum unit of work for each structure where railing is satisfactorily furnished and installed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.0905	Railing Tubular Steel Galvanized Pedestrian South Wall	LS

Payment is full compensation for fabricating, galvanizing, painting, transporting, and installing the railing, including any touch-up and repairs.

363. Maintenance of Lighting Systems, Item SPV.0105.1006.

A Description

Maintain existing and proposed lighting system beginning on the date that the contractor's activities (electrical or otherwise) at the job site begin. Take responsibility for the proper operation and maintenance of all existing and proposed lighting systems which are part of, or which may be affected by, the work until final acceptance or as otherwise determined by the engineer.

Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, initiate a request for a maintenance transfer and preconstruction inspection, as specified elsewhere herein, to be held in the presence of the engineer and a representative of the party or parties responsible for maintenance of any lighting systems which may be affected by the work. Make the request for the maintenance preconstruction inspection no less than seven calendar days prior to the desired inspection date.

Existing lighting systems, when depicted on the plans, are intended only to indicate the general equipment installation of the systems involved and shall not be construed as an exact representation of the field conditions. Visit the site to confirm and ascertain the exact condition of the electrical equipment and systems to be maintained.

Maintenance of the lighting system includes but not limited to lighting control cabinets: HL-40-UN, HL-40-LE, HL-40-MW, HL-40-ZW, HL-40-ZE, HL-40-TA, HL-40-ZN, HL-40-HY.

The following lighting control cabinets will be utilized only long enough to allow the installation of temporary lighting and then are to be removed: HL-40-WA, HL-40-KT.

The following lighting control cabinets are new and will be used for both temporary and final lighting: HL-49-WB, HL-40-AD, HL-40-DX.

B (Vacant)

C Construction

C.1 Existing Lighting Systems

Existing lighting systems are defined as any lighting system or part of a lighting system in service prior to this contract. The contract drawings indicate the general extent of any existing lighting. Ascertain the extent of effort required for compliance with these specifications; failure to do so will not be justification for extra payment or reduced

responsibilities. Clear and replace any knockdowns or damage caused to the existing lighting system, regardless of who causes the damage. Maintain existing lighting system as follows:

Partial Maintenance: Only maintain the affected circuits if the number of circuits affected by the contract is equal to or less than 40% of the total number of circuits in a given controller and the controller is not part of the contract work unless otherwise indicated. Ensure engineer approval to isolate the affected circuits by means of in-line waterproof fuse holders as specified elsewhere.

Full Maintenance: Maintain the entire controller and all associated circuits if the number of circuits affected by the contract is greater than 40% of the total number of circuits in a given controller, or if the controller is modified in any way under the contract work.

C.2 Proposed Lighting Systems

Proposed lighting systems are any temporary or final lighting systems or part of a lighting system to be constructed under this contract.

Maintain all items installed under this contract, including, but not be limited to, any equipment failures or malfunctions as well as equipment damage either by the motoring public, contractor operations, or other means.

Excluding damage due to contractor operations, the contractor will be reimbursed for replaced equipment, materials only, if the invoice paid for the individual piece of equipment is greater than $500. The cost of maintaining equipment installed under this contract, labor, mobilization, tools and incidentals along with repairs due to contractor operations are incidental to this bid item.

C.3 Maintenance Operations

Maintain lighting units (including sign lighting), cable runs, and lighting controls. In the case of a pole knockdown or sign light damage caused by normal vehicular traffic, promptly clear the lighting unit and circuit discontinuity and restore the system to service. Reinstall the lighting unit (if salvageable), or install a new one.

Provide weekly night-time patrol of the lighting system, with patrol reports filed immediately with the engineer and copied to the region lighting coordinator with deficiencies corrected within 24 hours of the patrol. Present patrol reports on standard forms as designated by the engineer. Uncorrected deficiencies may be designated by the engineer as necessitating emergency repairs as described elsewhere herein.

Perform corrective action on specific lighting system equipment according to the following chart. The chart lists the maximum response, service restoration, and permanent repair time.

Incident or Problem	Service Response Time	Service Restoration Time	Permanent Repair Time
Control cabinet out	1 hour	4 hours	7 Calendar days
Hanging mast arm	1 hour to clear	na	7 Calendar days
Motorist caused damage or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – Needs to reset breaker	1 hour	4 hours	na
Circuit out – Cable trouble	1 hour	24 hours	21 Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	na
Outage of 75% of lights on one tower	1 hour	4 hours	na
Outage of light nearest RR crossing approach, Islands and gores	1 hour	4 hours	na
Outage (single or multiple) found on night outage survey	na	na	7 Calendar days

C.4 Lighting

1. **Serve Response Time:** The amount of time from the initial notification to the contractor until a patrolman physically arrives at the location.
2. **Service Restoration Time**: The amount of time from the initial notification to the contractor until the time the system is fully operational again. (In cases of motorist-caused damage, the undamaged portions of the system are operational.)
3. **Permanent Repair Time**: The amount of time from initial notification to the contractor until the time permanent repairs are made if the contractor was required to make temporary repairs to meet the service restoration requirement.

Failure to provide this service will result in liquidated damages of $500 per day per occurrence. In addition, the department reserves the right to assign any work not completed within this timeframe to the State Electrical Engineering and Electronics Unit. Reimburse all costs associated to repair this uncompleted work. Failure to pay these costs to the State Electrical Engineering and Electronics Unit within one month after the incident will result in additional liquidated damages of $500 per month per occurrence. Unpaid bills will be deducted from the cost of the contract. Repeated failures and/or a gross failure of maintenance shall result in the State's Electrical Engineering and Electronics Unit being directed to correct all deficiencies and the resulting costs deducted from any monies owed the contractor.

C.5 Operation of Lighting

Maintain operational lighting every night, dusk to dawn. Do not operate duplicate lighting systems (such as temporary lighting and proposed new lighting) simultaneously. Do not keep lighting systems in operation during long daytime periods. Ensure that the lighting

system is fully operational and approved by the engineer prior to submitting a pay request. Failure to do so will be grounds for denying the pay request.

D Measurement
The department will measure Maintenance of Lighting Systems as a single lump sum unit of work, per contract, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.1006	Maintenance of Lighting Systems	LS

Payment is full compensation for Maintenance of Lighting Systems, both existing and proposed, weekly night-time patrol of the lighting system, mobilization, and filed patrol reports. No payment will be considered for damage or repairs due to contractor operations.
SEF 13_0822

364. Lighting System Integrator, Item SPV.0105.1007.

A Description
These special provisions describe coordinating lighting with various parties; record keeping, and documentation. Where the department is responsible for freeway lighting operation, maintenance, or utility locates on existing systems or systems overlapping project boundaries, the contractor's freeway lighting integrator will serve as the contractor's liaison to the department's electrical operations unit.

B Personnel Qualifications
Assign personnel experienced in underground utility construction and department lighting specifications and practices.

C Construction
At any one time during the project, the contractor shall assign one individual person as the freeway lighting integrator.

The freeway lighting integrator shall:

- Familiarize himself/herself with the location and nature of existing lighting circuits. This familiarity shall include the extent of any lighting system that overlaps project limits.
- Maintain a file of applicable permits or licenses issued to the contractor, and convey copies to the engineer.
- Keep with him/her at all times a contact list of affected lighting personnel.
- Maintain a record of tagouts and the clearance of tagouts.
- Interface with department electrical personnel to determine how contract limits might affect maintenance or operation of existing systems.

- Maintain ongoing contact with the department's Diggers' Hotline Coordinator to ensure that each of the two persons knows that all requested utility locates are marked in the field by the appropriate party. The intent here is to assure coordination. This special provision does not transfer additional utility locating responsibilities to the contractor, beyond those responsibilities already assigned to him by other provisions of the contract.
- Inform the department of any lighting outages, including outside the project limits where a lighting system crosses the project boundary.
- Maintain in any format real-time records of existing, removed and new lighting facilities. Include utility service extensions. Additional required records will include temporary connections and their ultimate removal.
- Maintain records of tests, including: "meg" tests, amperage draw per circuit leg, voltage reading at the disconnect, and voltage reading at the furthest pole per circuit leg. Convey these records at time of acceptance or partial acceptance.
- At the time of acceptance or partial acceptance, convey as-built drawings in both the following formats: plan redlines and .dgn electronic. Include utility service extensions.
- Secure copies of operators' manuals, tear sheets, etc. as may be provided by manufacturers of some lighting materials, and convey a minimum of three sets to the department.
- Work with the engineer to notify department electrical personnel of acceptance or partial acceptance.
- Perform related duties as may be needed to ensure continuity of freeway lighting during construction, and orderly transfer upon completion.
- Contractor must use GPS to provide coordinates of each light pole and control cabinet. The data must be entered into a Microsoft Excel 2007 spreadsheet along with other required fields as specified by WisDOT.

D Measurement

The department will measure Lighting System Integrator as one complete lump sum unit of work, acceptably completed per each pay item.

E Payment

The department will pay for measured quantities at the contract lump sum price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.1007	Lighting System Integrator	LS

Payment is full compensation for personnel costs; and for all required coordination, record-keeping, and documentation.

365. Sawing Concrete-Encased Duct Package, Item SPV.0105.2023.

A Description

The work under this provision consists of full depth sawing of cement encased multiple duct conduit below grade; preparing sawed conduit ends to accept adaptor couplings needed to allow transition of new PVC conduit from existing clay, fiber or PVC conduit.

B (Vacant)

C Construction

1. Equipment
   Use ring saw or concrete cutting chainsaw for all full-depth cuts. Use diamond blades. The contractor may use a high speed 16" construction saw on duct systems with less than 4-ducts when approved by the engineer.

2. Sawing Encasement
   Carefully expose the outside of the existing cement encasement. The contractor is to verify that the conduit lines are free of all cabling. Saw a full depth transverse cut through the encasement. Saw straight cuts with the surface remaining vertical over its full depth. Hand chip concrete away from sawed conduit duct ends to allow transition fittings to be placed over the ends. The exposed conduit will be protected from damage. Any damaged conduit ends will be the responsibility of the contractor and will require a resaw at the contractor's expense.

D Measurement

The department will measure Sawing Concrete-Encased Duct Package as a lump sum unit of work, acceptably completed. Up to 6 conduits per cement encasement will be considered a single unit.

Encasements in excess of 6 conduits will constitute multiple units.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.2023	Sawing Concrete-Encased Duct Package	LS

Payment is full compensation for sawing concrete encased duct packages full depth.

366. Remove Traffic Signals USH 18 and N. 97th Street, Item SPV.0105.3001; USH 18 and N. 95th Street, Item SPV.0105.3002.

A Description

This special provision describes removing existing traffic signals at the state owned intersections of USH 18 and N. 97th Street and USH 18 and N. 95th Street in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided. Specific removal items are noted in the plans.

B (Vacant)

C Construction

Arrange for the de-energizing of the traffic signals with the local electrical utility after receiving approval from the engineer that the existing traffic signals can be removed.

The department assumes that all equipment is in good condition and in working order prior to the contractor's removal operation. Prior to removal, inspect and provide a list of any damaged or non-working traffic signal equipment to the engineer. Any equipment not identified as damaged or not working, prior to removal, will be replaced by the contractor at no cost to the department.

State Owned Traffic Signals

Notify the department's Electrical Field Unit at (414) 266-1170 at least five working days prior to the removal of the traffic signals. Complete the removal work as soon as possible following shut down of this equipment.

Remove all standards and poles per plan from their concrete footings and disassemble out of traffic. Remove the transformer bases from each pole. Remove the signal heads, mast arms, luminaires, wiring/cabling, and traffic signal mounting devices from each signal standard, arm or pole. Ensure that all access hand hole doors and all associated hardware remain intact. Dispose of the underground signal cable, internal wires and street lighting cable off the state right-of-way. Deliver the remaining materials to the West Allis Electrical Service Facility at 935 South 60th Street, West Allis, WI. Contact the department's Electrical Field Unit at (414) 266-1170 at least five working days prior to delivery to make arrangements.

DOT forces shall remove the signal cabinet from the footing. The signal cabinet and associated signal cabinet equipment will be removed from the site by DOT forces and will remain the property of the department.

D Measurement

The department will measure Remove Traffic Signals as a single lump sum unit of work for each intersection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3001	Remove Traffic Signals USH 18 and N. 97th Street	LS
SPV.0105.3002	Remove Traffic Signals USH 18 and N. 95th Street	LS

Payment is full compensation for removing and disassembling traffic signals; for scrapping of some materials; for disposing of scrap material; and for delivering the requested materials to the West Allis Electrical Service Facility.

367. Transporting Signal and Lighting Materials IH 94 Ramps and STH 181, Item SPV.0105.3003; USH 45 Ramps and USH 18, Item SPV.0105.3004; USH 18 and N. 95th Street, Item SPV.0105.3005.

A Description

This special provision describes the transporting of department furnished materials for traffic signals and intersection lighting.

B Materials

Transport materials furnished by the department including: monotube arms and luminaire arms (to be installed on monotube assemblies).

Pick up the department furnished materials at the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for picking up the department furnished materials at least five working days prior to picking the materials up.

C (Vacant)

D Measurement

The department will measure Transporting Signal and Lighting Materials as a single lump sum unit of work in place, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3003	Transporting Signal and Lighting Materials IH 94 Ramps and STH 181	LS
SPV.0105.3004	Transporting Signal and Lighting Materials USH 45 Ramps and USH 18	LS
SPV.0105.3005	Transporting Signal and Lighting Materials USH 18 and N. 95th Street	LS

Payment is full compensation for transporting the monotube poles, monotube arms and luminaire arms (to be installed on monotubes). Installation of these materials is included under a separate pay item.

368. Install State Furnished Traffic Signal Cabinet IH 94 Ramps and STH 181 CB1, Item SPV.0105.3006; USH 45 Ramps and USH 18 CB1, Item SPV.0105.3007; USH 18 and N. 95th Street, Item SPV.0105.3016; IH 94 Ramps and STH 181 CB2, Item SPV.0105.3017; USH 45 Ramps and USH 18 CB2, Item SPV.0105.3018.

A Description
This special provision describes the installing of the state furnished Traffic Signal Cabinet for traffic signals.

B Materials
Use materials furnished by the department including: the traffic signal controller and the traffic signal cabinet. The department will provide notification at the preconstruction meeting of the Traffic Signal Cabinet vendor and provide the vendor's contact information.

Pick up the department furnished materials at the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for picking up the department furnished materials five (5) working days prior to picking up the materials.

Provide all other needed materials in conformance with standard specs 651.2, 652.2, 653.2, 654.2, 655.2, 656.2, 657.2, 658.2 and 659.2.

Append standard spec 651.3.3 (6) with the following:

Operate the completed traffic signal installation for 30 days consecutively, using the specified signal sequence(s) and all special functions, such as preemption as the plans show or as specified by the engineer.

C Construction
Perform work in accordance to standard specs 651.3, 652.3, 653.3, 654.3, 655.3, 656.3, 657.3, 658.3 and 659.3 except as specified below.

Request a signal inspection of the completed signal installation to the engineer at least five working days prior to the time of the requested inspection. The departments' Region Electrical personnel will perform the inspection.

Coordinate directly with the department's Traffic Signal Cabinet vendor to schedule the cabinet acceptance testing. Notify the department's Electrical Field Unit at (414) 266-1170 and participate in the acceptance testing. The department has the final determination of the cabinet acceptance testing date and time. The acceptance testing procedures will be provided by the department. The department shall not be responsible for project delays and costs due to the delays of delivery by the vendor or by the failure of the Traffic Signal Cabinet to pass acceptance testing.

D Measurement
The department will measure Install State Furnished Traffic Signal Cabinet [Location] as a single lump sum unit of work in place, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3006	Install State Furnished Traffic Signal Cabinet IH 94 Ramps and STH 181 CB1	LS
SPV.0105.3007	Install State Furnished Traffic Signal Cabinet USH 45 Ramps and USH 18 CB1	LS
SPV.0105.3016	Install State Furnished Traffic Signal Cabinet USH 18 and N. 95th Street	LS
SPV.0105.3017	Install State Furnished Traffic Signal Cabinet IH 94 Ramps and STH 181 CB2	LS
SPV.0105.3018	Install State Furnished Traffic Signal Cabinet USH 45 Ramps and USH 18 CB2	LS

Payment is full compensation for installing and testing the Traffic Signal Cabinet; for furnishing and installing all other items necessary (such as, wire nuts, splice kits and/or connectors, tape, insulating varnish, ground lug fasteners, etc.) to make the proposed system complete from the source of supply to the most remote unit; and for clean-up and waste disposal.

369. Transporting and Installing State Furnished Adaptable Traffic Signal Cameras IH 94 Ramps and STH 181, Item SPV.0105.3008; USH 45 Ramps and USH 18, Item SPV.0105.3009; USH 18 and N. 95th Street, Item SPV.0105.3010.

A Description

This special provision describes the transporting and installing of department furnished Adaptable Traffic Signal Cameras and mounting hardware.

B Materials

Pick up the department furnished Adaptable Traffic Signal Cameras and mounting hardware at the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical field unit at (414) 266-1170 to make arrangements for picking up the department furnished materials at least five working days prior to material pick-up.

C Construction

Notify the department's Electrical field unit at (414) 266-1170 at least five working days prior to the installation of the cameras.

Contact Justin Effinger at (262) 548-5676 to coordinate the locations of the cameras at least five working days prior to installation. Install the pole/arm mounting bracket, extension arm (if required) and cameras as shown on the plans (the final determination of location will be made by the department's electrical personnel to ensure best line of sight) per manufacturer recommendations.

Assist the department and vendor with aiming and programming the cameras during the adaptable traffic signal turn-on. The department will schedule the adaptable traffic signal turn-on and provide notification a minimum of five working days prior to turn-on.

D Measurement

The department will measure Transporting and Installing State Furnished Adaptable Traffic Signal Cameras [Location] as a single lump sum unit of work for each intersection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3008	Transporting and Installing State Furnished Adaptable Traffic Signal Cameras IH 94 Ramps and STH 181	LS
SPV.0105.3009	Transporting and Installing State Furnished Adaptable Traffic Signal Cameras USH 45 Ramps and USH 18	LS
SPV.0105.3010	Transporting and Installing State Furnished Adaptable Traffic Signal Cameras USH 18 and N. 95th Street	LS

Payment is full compensation for transporting and installing the State Furnished Adaptable Traffic Signal System cameras and mounting hardware; and for assisting the vendor and department with aiming and programming the cameras.

370. Install State Furnished EVP Detector Heads IH 94 Ramps and STH 181, Item SPV.0105.3011; USH 45 Ramps and USH 18, Item SPV.0105.3012; USH 18 and N. 95th Street, Item SPV.0105.3013.

A Description

This special provision describes the transporting and installing of state furnished Emergency Vehicle Preemption (EVP) Detector Heads, EVP Detector Head Mounting Brackets, and Confirmation Light Assemblies.

B Materials

Use materials furnished by the department including: Emergency Vehicle Preemption (EVP) Detector Heads, EVP Detector Head Mounting Brackets, and Confirmation Light Assemblies.

Pick up the state furnished materials at the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for picking up the state furnished materials at least five working days prior to picking the materials up.

C Construction

Install the EVP detector heads, EVP detector head mounting brackets, and confirmation light assemblies as shown on the plans. The department will determine the exact location to ensure that the installation does not create a sight obstruction. The department will terminate the EVP cable ends and install the discriminators and card rack in the cabinet.

Notify the department's Electrical shop at (414) 266-1170 upon completion of the installation of the Emergency Vehicle Preemption (EVP) Detector Heads and EVP Detector Head Mounting Brackets.

D Measurement

The department will measure Install State Furnished EVP Detector Heads as a single lump sum unit of work in place, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3011	Install State Furnished EVP Detector Heads IH 94 Ramps and STH 181	LS
SPV.0105.3012	Install State Furnished EVP Detector Heads USH 45 and USH 18	LS
SPV.0105.3013	Install State Furnished EVP Detector Heads USH 18 and N. 95th Street	LS

Payment is full compensation for transporting and installing of department furnished Emergency Vehicle Preemption (EVP) Detector Heads, EVP Detector head Mounting Brackets, and Confirmation Light Assemblies.

371. Existing Temporary EVP System IH 94 EB Ramps and STH 181, Item SPV.0105.3014; IH 94 WB Ramps and STH 181, Item SPV.0105.3015.

A Description

This special provision describes assuming ownership and maintaining temporary EVP systems at the temporary signalized intersection as shown in the plans.

B Materials

Assume ownership of the existing emergency vehicle preemption system compatible with the City of Milwaukee system and users.

C Construction

The Temporary EVP System, as shown in the temporary traffic signal plans or as directed by the engineer, shall be complete in place, tested, and in full operation during each stage and sub-stage of construction.

Determine a suitable location for the temporary EVP detectors for each stage and sub-stage of construction. Detectors may be mounted on the temporary traffic signal span wire or wood poles. Relocate the temporary EVP detectors to a suitable location if construction activities and/or construction staging changes impede the detector operation. Arrange for testing of equipment prior to acceptance of the installation for each construction stage.

All cables associated with the temporary vehicle detection system shall be routed to the cabinet. Each lead shall be appropriately marked as to which EVP channel it is associated.

Periodic adjustment and/or moving of the temporary EVP detectors may be required due to changes in traffic control, staging, or other construction operations.

Ensure that the temporary EVP system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

Remove the temporary EVP system upon project completion.

Provide WisDOT records of all EVP settings used during construction.

D Measurement

The department will measure Existing Temporary EVP System (Location) as a single complete lump sum unit of work per intersection, complete in place, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3014	Existing Temporary EVP System IH EB Ramps and STH 181	LS
SPV.0105.3015	Existing Temporary EVP System IH WB Ramps and STH 181	LS

Payment is full compensation for assuming ownership and maintaining all equipment, materials, and supplies; for maintaining and changing the EVP detectors to match the plans, traffic control, and construction staging; for relocating the temporary EVP detectors due to construction activities, if required; for testing the EVP system for each stage and sub-stage of construction; for periodically cleaning all temporary EVP detectors; for removing the temporary EVP system; and for cleaning up and properly disposing of waste.

372. Transporting and Installing State Furnished Radar Detection System USH 45 Ramps and USH 18, Item SPV.0105.3019.

A Description

This special provision describes the transporting and installing of department furnished Radar Detection System on for installation on monotube poles or arms.

B Materials

Pick up the department furnished Radar System at the department's electrical shop located at 935 South 60th Street, West Allis. Notify the department's electrical field unit (EFU) at (414) 266-1170 to make arrangements for picking up the department furnished materials at least five working days prior to material pick-up.

C Construction

Coordinate the locations of the radar units with the department's electrical personnel prior to installation. Install the department furnished pole/arm mounting brackets, extension arms (if required), and radar units per manufacturer recommendations. Install the power and communication cables to run continuously (without splices) from the traffic signal cabinet to the radar units plus an additional 16 feet in each pull box and an extra 10-feet in the monotube pole handhole. Terminate the ends of the cables, if required, and make all connections to the radar units. The EFU will install all required cabinet equipment in the traffic signal control cabinet. Make all final cable connections in the traffic signal cabinet.

Mark each end of the lead in the traffic signal cabinet and each cable in the monotube handhole to indicate the equipment label (i.e. RA1, RA2, etc.).

Notify department's Electrical Shop at (414) 266-1170 upon completion of the installation.

The department will provide notification of the radar detection system vendor and provide the vendor's contact information. Coordinate directly with the department's radar detection system vendor to arrange for the vendor to program the radar detection system on-site. Notify the department and vendor at least five working days prior to the date of programming. Assist the department and vendor with adjusting the radar units during the radar system programming.

D Measurement

The department will measure Transporting and Installing State Furnished Radar Detection System as a single lump sum unit of work for each intersection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3019	Transporting and Installing State Furnished Radar Detection System USH 45 Ramps and USH 18	LS

Payment is full compensation for transporting and installing the radar detection system, cable, mounting hardware, and radar units; arranging for and providing programming by the vendor; and for assisting the department and vendor during the radar system programming.

373. Temporary Traffic Signal Operation with Permanent Traffic Signal Equipment, Item SPV.0105.3020.

A Description

This special provision describes operating a temporary traffic signal with permanent traffic signal equipment.

B Materials

Use the permanent materials identified with separate bid items under this contract. Furnish all other necessary materials (connectors including wire nuts, splice kits, tape, insulating varnish or sealant and ground lug fasteners) ensuring all materials are in compliance with the WisDOT Qualified Electrical Products List.

Provide all other needed materials in conformance with standard specs 651.2, 652.2, 653.2, 654.2, 655.2, 656.2, 657.2, 658.2 and 659.2.

C Construction

Perform work in accordance to standard specs 651.3, 652.3, 653.3, 654.3, 655.3, 656.3, 657.3, 658.3, 659.3, and 661.3 except as specified below.

Notify the department's Electrical Field Unit (EFU) at (414) 266-1170 at least five working days prior to cabling the traffic signal installation. Ensure the underground and above ground installations have been approved by the EFU prior to cabling.

Ensure that the permanent Meter Breaker Pedestal is installed and electrical service is operational at the intersection. Relocate the department furnished temporary traffic signal cabinet from the temporary location to the permanent concrete control cabinet base and make all connections. Install department supplied temporary communication equipment in the cabinet. Coordinate and verify that the department has an established temporary communication connection for implementation of temporary traffic signal timings.

Relocate the video detection system from the temporary location to the permanent equipment and make all connections. Install the temporary video detection cameras at the locations shown on the plans and as directed by the WisDOT EFU. Install power cable and signal cabinet equipment. Aim the video cameras to provide detection at the location shown on the plans and make the video detector system fully operational. WisDOT will be responsible for setting the temporary video detection zones and operating the temporary video detection equipment.

In the event, at installation or turn on date, a noticeable obstruction is present in line with the video detection zone(s), advise the engineer before setting the zone.

The video detection system, as shown in the traffic signal construction plans, shall be complete, in place, tested, and in full operation during each stage and sub-stage of construction.

WisDOT will maintain all temporary vehicle detection zones as the plans show or as the engineer directs. The temporary vehicle detection zones will be set near the vicinity and within the approximate distance from the stop bar as shown on the plans. WisDOT will check temporary vehicle detection zones at a minimum every other week and at the opening of each stage of temporary traffic signal operation to ensure that they are working and are aimed properly. WisDOT will check and/or adjust temporary vehicle detection zones immediately upon notification by the department and/or construction team that the video detection system is not operating correctly. Assist WisDOT in adjusting the temporary vehicle detection sensors if they need to be relocated and/or aimed due to construction activities.

The department will be responsible for all temporary traffic signal timings. Provide the department a minimum five working advance notice prior to needing all timings and/or timing changes. The department may request traffic signal timing changes to an approved incident timing plan during the project. The department will implement any approved incident timing plan immediately upon notification of the change and immediately upon notification of switching the timing plan back to normal operation. The department will record the times of operation of the incident timing and subsequent return to normal operation.

Relocate the temporary EVP system from the temporary location to the permanent equipment and make all connections. Install the temporary EVP detectors at the locations shown on the plans and according to the manufacturer's recommendations. Relocate the temporary EVP detectors to a suitable location if construction activities and/or construction staging changes impede the detector operation. Arrange for testing of equipment prior to acceptance of the installation for each construction stage.

The Temporary EVP System, as shown in the temporary traffic signal plans or as directed by the engineer, shall be complete in place, tested, and in full operation during each stage and sub-stage of construction.

All cables associated with the EVP System shall be routed to the cabinet. Each lead shall be appropriately marked as to which EVP channel it is associated.

Periodic adjustment and/or moving of the temporary EVP detectors may be required due to changes in traffic control, staging, or other construction operations.

Provide WisDOT records of all EVP settings used during construction.

Ensure that the temporary vehicular detection system and temporary EVP detection system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

Request a signal inspection of the completed temporary signal installation to the engineer at least five working days prior to the time of the requested inspection. The departments' Region Electrical personnel will perform the inspection. Do not turn on the traffic signal until the EFU has approved the installation. Flash the traffic signal a minimum of three working days prior to temporary traffic signal operation. STH 181 shall operate with yellow-yellow flash and the IH 94 Ramps operate with red flash.

At the end of the Temporary Traffic Signal Operation with Permanent Signal Equipment stage remove the temporary video detection system from the permanent installation. Cover and de-energize the traffic signal heads until the permanent traffic signal is ready for operation. Remove the traffic signal cabinet and temporary video detection and deliver the department furnished traffic signal cabinet, controller, video detection equipment, and temporary communication equipment to the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for delivering the department furnished materials five working days prior to delivery.

Remove the temporary EVP system upon project completion.

D Measurement

The department will measure Temporary Traffic Signal Operation with Permanent Traffic Signal Equipment as a single lump sum unit of work for each intersection, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3020	Temporary Traffic Signal Operation with Permanent Traffic Signal Equipment	LS

Payment is full compensation for installing and testing the traffic signal installation; for furnishing and installing all other items necessary (such as, wire nuts, splice kits and/or connectors, tape, insulating varnish, ground lug fasteners, etc.) to make the proposed system complete from the source of supply to the most remote unit; for properly disposing of surplus materials; for making inspections; for checking and/or adjusting the temporary detection zones on an every other week basis; for maintaining and changing the temporary detection zones to match the plans, traffic control, and construction staging; for relocating the temporary detection sensors due to construction activities, if required; for periodically cleaning all temporary vehicle detector and temporary EVP equipment; for installing, operating, and removing the temporary vehicle detection system; for installing, operating, and removing the temporary EVP system; for installing, operating, removing, and

delivering the department furnished temporary traffic signal cabinet; and for cleaning up and properly disposing of waste.

374. Install Fiber Optic Communications in Cabinet IH 94 Ramps and STH 181, Item SPV.0105.3051; USH 45 and USH 18, Item SPV.0105.3052; USH 18 and N. 95th Street, Item SPV.0105.3053.

A Description

This special provision describes installing fiber optic communications equipment in traffic signal cabinets.

B Materials

The department will furnish pre-terminated fiber optic patch panels and managed Ethernet switches. The materials will be provided with the traffic signal cabinet. The patch panels will have pre-terminated fiber optic cable pigtails. Provide two each 1-meter lengths of ST-ST single mode fiber jumper (2 fibers per jumper) from the patch panel to the Ethernet switch. Provide a 1-meter length of CAT-5e cable from the Ethernet switch to the controller. Provide a 1-meter length of CAT-5e cable from the Ethernet switch to the Interface Panel. CAT-5e patch cords shall have factory pre-terminated RJ45 / 8P8C connectors on both ends per TIA/EIA T568B. Provide all patch panel, Ethernet switch, and Interface Panel attachment hardware.

Provide a 14 AWG XLP insulated, stranded, copper, 600 volt AC locate wire through the conduit run from the communication vault to the traffic signal cabinet. Connect the locate wire by using a silicone filled wire nut at each pull box, vault or other access point. Alternatively, use a single wire through the access points, leaving a 6 foot coil in each pull box, vault or other access point for splicing. All material under this item shall meet the requirements of standard spec 655.

C Construction

Install the patch panel and Ethernet switch on the side of the traffic signal cabinet opposite the electrical service at a location as approved by the engineer. With approval by the engineer, the Ethernet switch may be placed on a shelf near the patch panel. Install the pre-terminated fiber optic cable in conduit from the patch panel to the communication vault as specified in standard spec 678.3.1. Fiber optic cable ends shall be covered securely to protect open ends during installation in raceways. Leave the remainder of the fiber optic cable coiled in the communication vault.

Install the fiber jumpers and CAT-5e cable and provide a communications link from the communication vault to the controller. Install the CAT5-e cable from the Interface Panel to the Ethernet switch.

Connect the locate wire by using a wire nut at each access point. Alternatively, use a single wire through the access points.

D Measurement
The department will measure Install Fiber Optic Communications in Cabinet (Location) as a single lump sum unit of work in place, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item.

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.3051	Install Fiber Optic Communications in Cabinet IH 94 Ramps and STH 181	LS
SPV.0105.3052	Install Fiber Optic Communications in Cabinet USH 45 and USH 18	LS
SPV.0105.3053	Install Fiber Optic Communications in Cabinet USH 18 and N. 95th Street	LS

Payment is full compensation for installing pre-terminated patch panels, Ethernet switches, and fiber optic cable in conduit; furnishing and installing attachment hardware, fiber jumpers, CAT-5e cable, and locate wire.

375. Painting Polysiloxane System B-40-855, Item SPV.0105.4500.

A Description
This work consists of steel surface preparation, shop application of the two-coat polysiloxane system, incidental field painting, and repairs to all damaged areas of structural steel in accordance to the pertinent parts of standard spec 517 and as hereafter provided.

Included in this work is the shop painting of the interior surface areas of the steel box girders and the framing therein. The contractor may, at his option, coat the interior of the box girders using the first two coats of the three-coat epoxy paint system per standard spec 517.2.4. If this option is chosen, the following criteria apply:

- Cover the box girder in storage or erected if exposed to sunlight for more than 30 days.
- There will be no adjustment in bid price.

B Materials
Furnish a coating system from the department's approved product list consisting of an organic zinc rich epoxy prime coat and a finish coat of polysiloxane having a resin co-reacted or blended with acrylic, epoxy, or urethane resin or combination thereof supplied by the manufacturer of the zinc rich primer. The coatings shall not contain any isocynates or polyisocynates components. The organic zinc rich epoxy primer shall be in accordance to standard spec 517.2. The organic zinc rich epoxy primer application shall be in accordance to standard specs 517.2 and 517.3.

The finished color of the Polysiloxane coating for the exterior of structural steel box girders, including all exterior diaphragms and bracing on steel box girder bridges shall match the Federal Standard No. 595B indicated on the plans.

The finished color of the coating for all structural steel on the interior of structural steel box girders, including all diaphragms and bracing on the interior of steel box girders, shall match the Federal Standard No. 595B as follows:

White – #27925

C Construction

Remove all visually evident steel defects in accordance to AASHTO M 160 prior to blast cleaning. When material defects exposed by blast cleaning are removed, restore the blast profile by either blast cleaning or by using mechanical tools in accordance to SSPC-SP11. Mill or grind flame cut edges so the lines are parallel to the length of the plate edge. Grind exterior corners to a 3/32" radius.

Supply the engineer with product data sheets before any coating is applied. The product data sheets shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, and the minimum drying time for shop or field applied coats. The manufacturer shall provide the recommended procedures for coating galvanized bolts, nuts and washers. Provide the range of application for temperature conditions and the procedures for re-coat.

Except for the required incidental field finish work including bolted field splices and repair of damaged areas, shop apply the coatings at the following dry film thicknesses:

Organic zinc rich epoxy primer .....4 mils min
Polysiloxane finish coat .....4 to 8 mils
Total paint system .....8 mils minimum, 13 mils max.

Measure all thicknesses in accordance to SPCC PA 2.

Apply the organic zinc rich epoxy primer in accordance to standard spec 517.3 except that the dry film thickness on the faying surfaces of bolted field splices shall not be less than 2 mils or greater than 2.5 mils. Mask the faying surfaces during application of the finish coat.

Do not apply polysiloxane if the temperature of air or the steel is below 35 F. A mist coating of polysiloxane in accordance to the manufacturer's procedures is recommended to minimize bubbling.

On the interior of box girders, the paint on the top of the bottom flange shall be uniformly dusted with silica sand or other grit material acceptable to the engineer, to create a non-slip walking surface within the interior of the box girders. The silica sand or other approved grit material shall be uniformly applied on the wet film surface of the first interior coat.

Blow off any loose, non-adhered sand or grit prior to application of the second interior coat.

Revise the last sentence of paragraph (4) of standard spec 517.3.1.5.2 as follows:

The maximum time between coats shall be in accordance to the manufacturer's recommendations except that no more than 60 days may elapse between coats of Polysiloxane System with the exception of additional time for field application of the polysiloxane finish coating in areas where incidental painting is required or damage has occurred.

After delivery of the girders to the project site, prior to erecting the girders, visually inspect the girders and clean if necessary of all dust, dirt, road salts and other contaminants that have collected and adhered on the surfaces of the girders during shipping to the project site. Clean by use of a low-pressure water blast or other means acceptable to the engineer to remove all visually identifiable contaminants, without damage to the shop-applied girder paint.

Take special care during construction to minimize the number and size of touch-up spots. Follow the manufacturer's recommendations for damaged area repairs. The engineer must approve the field paint appearance prior to final acceptance.

Protect the property in the vicinity of the structure from paint over-spray damages for the completion of incidental field painting such as field splices and repair of all damaged areas in accordance to standard spec 517.3.1.8. Prior to applying the polysiloxane field coating, clean all primed surfaces and/or areas to be re-coated with light water blast and prepare surfaces as per manufacturer's recommendations. Prior to painting, all surface cleaning and application procedures shall be approved by the engineer.

D Measurement

The department will measure Painting Polysiloxane System (Structure) as a single lump sum unit of work for each structure, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.4500	Painting Polysiloxane System B-40-855	LS

Payment is full compensation for steel preparation, for furnishing and applying the paint materials, for protecting the site, for incidental field painting and repairs of damaged areas.

376. Trial Drilled Foundation Shaft 98.43-Inch, Item SPV.0105.4510.

A Description

The work included here in consists of installing a non-production, trial drilled foundation shaft to verify the proposed means and methods of drilled foundation shaft installation for construction of drilled foundation shafts shown in the plans.

Engineer acceptance of a successfully constructed trial drilled foundation shaft is required prior to beginning the installation of any other drilled foundation shafts for the contract.

B Materials

All materials for the trial shaft are to be as specified in the bid item Drilled Foundation Shaft 98.43-Inch.

C Construction

The trial drilled foundation shaft must be installed by the same contractor and work crews who will perform the production drilled foundation shaft installation work on the contract. Use the same equipment and installation procedures intended to be used for the production work on the contract and in accordance to the accepted Drilled Foundation Shaft Installation Plan.

The trail drilled foundation shaft is intended to be installed in the same or similar soil profile as the production drilled foundation shafts included in the contract. Construct the trial drilled foundation shaft within a 100-foot radius of Pier SW02 of B-40-855 or as approved by the engineer. The drilled foundation shaft bottom elevation must match the drilled foundation shaft bottom elevation shown in the plans for pier SW02. The overall length of the shaft must be within +/- 5 feet of the drilled foundation shaft for SW02 of B-40 855.

The trial drilled foundation shaft shall consist of one 98.43-inch diameter drilled shaft as shown on the plans for B-40-855. The trial drilled foundation shaft shall be reinforced the same as the production drilled foundation shafts for pier SW02 of B-40-855 including splices of the vertical reinforcement cage and the extension of reinforcement out the top of the foundation shaft. Include eight crosshole sonic logging (CSL) tubes within the trial drilled foundation shaft.

Construction of the trial drilled shaft shall be as specified under the item Drilled Foundation Shaft 98.43-Inch and the accepted Drilled Foundation Shaft Installation Plan. Dispose of all soil excavation and excess materials removed for construction of the trial drilled foundation shaft in accordance to the requirements of the contract.

Base grout the trial drilled foundation shaft as shown on the plans and per the requirements of SPV Article Drilled Foundation Shaft Base Grouting included in the contract. The trial drilled foundation shaft must be base grouted by the same contractor and work crews who will perform the production drilled foundation shaft base grouting work on the contract. Use the same equipment and installation procedures intended to be used for the production

base grouting work on the contract in accordance to SPV Article Drilled Foundation Shaft Base Grouting.

Acceptance of the trial drilled foundation shaft will be as specified for Drilled Foundation Shaft 98.43-Inch including non-destructive testing as specified for Drilled Foundation Shaft 98.43-Inch. Upon acceptance by the engineer, cutoff the trial drilled foundation shaft and remove as necessary so as to be at least 2 feet below finished grade, or 4 feet below proposed top of pavement, and abandoned in place.

D Measurement

The department will measure Trial Drilled Foundation Shaft (diameter) as a single lump sum unit of work, acceptably completed.

Unsuccessful or rejected trial drilled foundation shaft installations, or trial drilled foundation shafts not meeting specifications, will not be measured for payment or be cause for additional compensation.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.4510	Trial Drilled Foundation Shaft 98.43-Inch	LS

Payment is full compensation for drilling and excavating the trial drilled foundation shaft; handling and properly disposing of excavated, augured and cored soils; placing the concrete for drilled foundation shaft to the required diameter and depth; furnishing and installing the reinforcing steel; furnishing and placing CSL tubes; meeting QMP drilled shafts special provision; base grouting, removal, backfilling; and for site restoring.

377. Trial Secant Wall Panel 47.24-Inch, Item SPV.0105.4520.

A Description

The work consists of installing a trial (non-production) secant wall panel to verify the proposed means and methods of drilled shaft installation for construction of secant pile walls included in the contract.

The trial secant wall panel must be installed by the same contractor and work crews who will perform the production drilled shaft installation work on the contract. The same equipment and installation procedures intended to be used for the production work on the contract and in accordance to the accepted drill shaft installation plan must be followed for construction of the trial secant wall panel.

Engineer acceptance of a successfully constructed trial secant wall panel is necessary prior to beginning the installation of any other secant piles included in the contract.

B Materials
All materials for the trial panels are to be as specified for the bid items Wall Secant Pile 47.24-Inch.

C Construction
Construct the trial secant wall panel as specified under the item Wall Secant Pile 47.24-Inch and the accepted wall secant pile drilled shaft installation plan. The trial secant wall panel shall consist of three overlapping 47.24-inch diameter drilled shafts. Reinforce the shafts as shown in the construction plans for Structure R-40-546. Provide and install 4 crosshole sonic logging (CSL) tubes in at least one shaft of the trial secant wall panel. Drilled shafts within the trial secant wall panel shall extend to a depth that is equal to the maximum depth of production shafts required for Structure R-40-546.

Dispose all soil excavation and excess materials removed from drilled shaft excavations for construction of the trial secant wall panel in accordance to the requirements of the contract.

Excavate the trial secant wall panel and completely expose the entire face to a depth of 20-feet below the top of the trial secant wall panel. Provide safe access in accordance to OSHA regulations for the engineer to inspect the entire exposed face of the full-width trial secant wall panel for a period of at least three business days after the face of the trial secant wall panel is excavated and exposed. Provide shoring if necessary to accomplish this.

The trial secant wall panel will be subject to non-destructive testing as specified for the item Wall Secant Pile 47.24-Inch. Acceptance of the trial secant wall panel will be as specified for the item Wall Secant Pile 47.24-Inch. Upon acceptance by the engineer, remove the trial secant wall panel to at least elevation 763.59 or as otherwise directed by the engineer and backfill the trial secant wall panel. Backfill the excavation to meet minimum standard compaction requirements per the standard specifications. Any necessary sheeting, shoring, and removal of the trial secant wall panel shall be included in the cost of the trial wall panel.

D Measurement
The department will measure Trial Secant Wall Panel 47.24-Inch as a single lump sum unit of work consisting of three consecutive overlapping secant shafts, acceptably completed.

Unsuccessful or rejected trial wall panels installations, or trial secant wall panels not meeting specifications, will not be measured for payment or be cause for additional compensation.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.4520	Trial Secant Wall Panel 47.24-Inch	LS

Payment is full compensation for excavating and drilling the trial secant wall panel; handling and properly disposing of excavated material, providing and placing the concrete for secant pile drilled shafts to the diameter and depth required; providing and installing reinforcing steel; providing and placing CSL tubes; core sample; meeting QMP drilled shafts special provision; shoring; removal; backfilling and site restoration; and to meet these specifications including successful non-destructive testing.

378. Underdeck Utility B-40-866 Item SPV.0105.4540.

A Description

This section describes furnishing and installing a duct package of three, 4-inch diameter, Fiberglass Reinforced Epoxy (FRE) conduits, the conduit support system including all support hangers, connections to girders, and concrete diaphragm penetrations on Structure B-40-833 as shown on the plans.

B Materials

Components shall conform to material requirements specified on the plans and as specified hereinafter.

Conduit shall be non-metallic, filament-wound epoxy, suitable for direct burial, concrete encasement, and suspended from bridge members without regard to outdoor ambient light. The product shall contain carbon black to provide ultraviolet protection.

The conduit shall have an interference joint system consisting of an integral bell and spigot with interlocking male and female threads. Epoxy adhesive shall be applied on joints per manufacturer's specifications prior to use.

Product shall be listed by Underwriters Laboratories and conform to the National Electrical Code.

The ID dimension shall be full, actual trade size.

All adaptors, couplings, expansion joints and suspended hangers shall be FRE fittings corresponding to and manufactured for use with FRE conduit as specified on the plans.

C Construction

Construct according to the details shown in the plans, the pertinent provisions of standard spec 502 and 652 and specifications provided by the City of Milwaukee, Articles 207, 208, 209, 210 and 211.

The three-duct package to be installed on B-40-866 consists of three 4-inch ducts, one high by three wide.

Install the conduit 5 feet beyond the back of the bridge abutment walls. Install a fiberglass to PVC adaptor on the end of each duct and temporarily cap.

Coupling of the duct sections shall be accomplished and secured by first applying epoxy adhesive then mating a spigot end into an integral bell end with a blow to the open end of the duct section.

Submit shop drawings for conduits, hanger support tubes, hanger support assemblies, expansion couplings and hanger layout showing support spacing to Ms. Karen Rogney at (414) 286-3243 of the City of Milwaukee for review 60 business days in advance of the bridge deck placement.

Notify Mr. Bob Brooks at (414) 286-3241 of the city's Underground Operations five business days in advance of the final installation of the conduit system.

Install all FRE duct and components according to the manufacturer's instructions.

D Measurement

The department will measure Underdeck Utility B-40-866 as a single lump sum unit of work, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.4540	Underdeck Utility B-40-866	LS

Payment is full compensation for furnishing and installing the underdeck utility ducts and the complete conduit support system including galvanized steel hanger support tubes, pultruded FRP and stainless steel components of the utility hanger assembly, stainless steel hanger rods, expansion couplings, abutment and pier diaphragm penetrations, miscellaneous hardware. Duct and associated fittings rendered unfit for use by the contractor through the contractor's operations shall be replaced by the contractor in kind at the contractor's own cost and expense.

379. Expansion Device Modular LRFD B-40-852, Item SPV.0105.4550; Expansion Device Modular LRFD B-40-855, Item SPV.0105.4555.

A Description

This special provision describes designing, furnishing and installing a shop-fabricated waterproof modular expansion device in accordance to the current AASHTO LRFD Bridge Design and Construction Specifications, the applicable requirements of standard spec 502, the plans, and as hereinafter provided. The modular expansion joint device shall seal the deck surface, curbs, medians, and parapet walls as indicated on the plans. Any leaking or seeping of water through the joint will be cause for rejection of the modular expansion device.

B Materials

B.1 General

Furnish parts and elements that have material properties meeting the physical and chemical requirements shown in their manufacturer's technical data or as noted below, except as modified by pertinent parts of the standard specifications, this special provision, or the plans. Furnish certified test results from the manufacturer attesting to physical and chemical properties. Do not use any aluminum components or hardware.

B.2 Modular Expansion Device System Components

Furnish components for the Modular Expansion Device System from one of the following manufacturers and model series:

- D.S. Brown Company, Steelflex® Modular Expansion Joint Systems (D-Series)
  (419) 257-3561

- Watson, Bowman, & Acme Inc., Wabo® Modular System (STM-Series)
  (716) 691-7566

B.3 Steel Plates, Bars, Shapes, and Sheets

Furnish steel plates, bars, shapes, and extrusions that have been fabricated from high strength, low alloy grade 50 or grade 50W steel conforming to ASTM A709, or as shown on the approved shop drawings. Anchor bars and support bar boxes may be fabricated from ASTM A709 grade 36 steel. Furnish anchor bolts, bolts, nuts, and washers that conform to the requirements of ASTM A325. Secondary shapes or joint components may be assembled with bolts, nuts, and washers conforming to ASTM A490.

Furnish stainless steel sheets for the sliding surfaces of support bars that conform to the requirements of ASTM A167, alloy 304, 20 micro-inch RMS finish.

B.4 Elastomeric Seal Elements

Furnish preformed elastomeric seal elements that are polychloroprene (neoprene) of a rectangular or strip cross section having a minimum thickness of ¼-inch and conform to ASTM D3542 modified to omit the recovery test. The elastomeric seal elements shall meet the following physical properties:

Property	Requirement	Test Method
Tensile Strength, min	2000 psi	ASTM D412
Elongation @ Break, min	250%	ASTM D412
Hardness, Type A, Durometer	60± 5 pts	ASTM D2240
Compression Set, 70 Hrs @ 212º F, max	35%	ASTM D395, Method B, Modified
Ozone Resistance, after 70 hours at 100º F under 20% Strain with 100 pphm ozone	No Cracks	ASTM D1149 and D518, Method A
Mass Change in Oil 3 after 70 hours @ 212º F, Mass Change, max	45%	ASTM D471

Furnish manufacturer's certification for production of polychloroprene represented, showing test results for the cured material supplied and certifying that it meets all specified requirements.

The seal element shall be one piece, and full length of the expansion joint including curb and parapet face projections. The lubricated adhesive for installing the preformed elastomeric elements in place shall be one-part moisture curing polyurethane and hydrocarbon solvent mixture as recommended by the manufacturer.

C Construction

C.1 Design

Design all components of the prefabricated modular expansion joint assembly to satisfy the limit states using the loads, load distribution factors, and load factors as specified in AASHTO LRFD Bridge Design Specifications Article 14.5.6.9.

C.2 Shop Drawings and Test Reports

The manufacturer of the prefabricated expansion joint assembly shall prepare shop drawings showing details of the fabricated assembly and installation. At a minimum, include the required information specified in the current AASHTO LRFD Bridge Construction Specifications Article 19.2.2 in the submitted shop drawings. In addition, the manufacturer shall submit test reports and certificates specified in the current AASHTO LRFD Bridge Construction Specifications Article19.2.2.

C.3 Fabrication

Fabricate the modular expansion device system in accordance to the details shown on the shop drawings. Tolerance requirements shall be in accordance to AASHTO specifications.

C.3.1 Support Bars

If guided expansion bearings are provided at the expansion joint location, fabricate and place support bars parallel to the intended direction of joint movement. Otherwise fabricate and place support bars parallel to the roadway. Provide support bars at a maximum support assembly spacing of 4'-0". Furnish support bars that are not less than 1½-inches in width and at least 4-inches in height; each transverse center beam shall have an individual support bar.

Support bars shall incorporate stainless steel sliding surfaces to minimize resistances to joint movements. Stainless steel shall be welded to support bars. Support the support bars above, below, and laterally as required to prevent uplifting, transmit bearing loads, and to maintain positioning of the bar.

Fabricate support bar bearings from polyurethane compound with PTFE self lubricating surfaces having engineering properties equivalent to adiprene, Teflon, or cast nylon with MDS. Positively lock the support bar bearings and springs or spacers into the support box by a dowel or pin. The connection must permit subsequent removal and replacement of the bearings and springs. The support bar springs shall be constructed similarly to the bearings

but shall provide the required precompressive force to maintain the support bar in place while under traffic loads. Use a suitable equilibrium device that works counter to the compression forces of the sealing elements to maintain equalized expansion properties for each element across the modular joint assembly. Furnish anchor plates for the support bar springs or neoprene blocks that have a minimum thickness of ¾-inch.

C.3.2 Transverse Center Beams
Transverse center beams shall be at least of 4½-inches in height and have a minimum vertical web thickness of ¾-inch. Make shop splices in the transverse center beam with a full penetration weld. The exterior transverse beams shall have a minimum vertical web thickness of ¾-inch.

The connections between the transverse center beams and support bars shall be a full penetration weld in accordance to the details shown on the plans. Full penetration welds to be tested by ultrasound using the compressive criteria.

C.3.3 Support Bar Boxes
Furnish support bar boxes that consist of steel plates not less than ½-inch in thickness fabricated with continuous welds at all joints. The inside dimensions of the box shall be consistent with all boxes and within +0.040 inches of prescribed height as measured where the bearings and spring compress about the support bar. Fabricate support box plates with a continuous weld. Make anchorage details as shown on the plans.

C.3.4 Structural Steel Surfaces
Galvanize after fabrication, in accordance to ASTM A123, all structural steel surfaces of the expansion joint devices and anchorages, except ASTM A490 bolts, components of stainless steel, and parts coated with polyurethane, adiprene, nylon, or Teflon.

Galvanize or metallize in accordance to standard spec 635 all bolts, nuts, washers, and steel components that are not galvanized using the above procedure, including all ASTM A490 bolts.

If a retainer clip is used for locking the neoprene strip type seal, continuously weld it on its top side. Due to the galvanizing coating requirement, also make a continuous weld underneath the clip.

All welding shall be in accordance to AWS D1.5 or D1.6 of the welding code and shall be done by certified welders only. A shop certified under AISC category for simple structures shall perform fabrication.

The fabricator will be permitted to shop weld pre-galvanized transverse roadway sections, complete with anchorages, of the expansion device steel extrusions. The pre-galvanized roadway sections shall be not less than 10 feet long. The pre-galvanized roadway side sections shall have additional anchorages, if required, so as to provide an anchorage within 9 inches of each end of the section. Abutting ends shall be beveled ¼-inch on three sides and deburred. All galvanizing shall be completely removed from the areas to be welded.

The pre-galvanized sections shall be groove welded on three sides with care taken to prevent weld material from entering the gland groove. The weld across the top of the extrusion shall be ground smooth and all areas of galvanizing damaged by the welding operations shall be repaired in accordance to standard spec 635. Make field splices in transverse center roadway sections with a partial penetration weld.

C.4 Installation

Install in accordance to the plan details, standard spec 502.3.6.3.3, the manufacturer's and supplier's approved shop drawings, and as directed by the engineer. Support the modular joint assembly at 8'-0 minimum spacing along both sides of the joint during installation and prior to deck concrete placement.

Remove all modular expansion joint forming material from the joint opening. Pre-set the modular joint assembly in accordance to the approved shop drawings, joint temperature setting data, and specifications. The maximum joint opening for a single modular unit shall be 3 inches.

Installation tolerances shall be within the limits specified in Article 19.5.4.3.5 of the current AASHTO LRFD Bridge Construction Specifications.

The joint assembly manufacturer shall furnish technical assistance to the contractor and engineer through the personal services of a technical representative, who is a fulltime employee of the manufacturer during installation of the joint sealing systems. This representative shall be accessible to the engineer and shall be at the site during the work that involves the setting of all parts of each modular expansion joint assembly. The contractor shall be responsible for informing the representative prior to the date of installation.

D Measurement

The department will measure Expansion Device Modular LRFD B-40-852 and Expansion Device Modular LRFD B-40-855 as a single lump sum unit of work for the structure, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.4550	Expansion Device Modular LRFD B-40-852	LS
SPV.0105.4555	Expansion Device Modular LRFD B-40-855	LS

Payment is full compensation for designing, preparing and submitting shop drawings, providing test reports and certificates, providing on-site technical assistance, furnishing and placing the device complete in place; furnishing and completely installing all elements and parts of the joints, anchors, armor or structural metal; galvanizing materials; furnishing and installing all hardware, pads, bonding material, and reinforcing bars within the blockout not otherwise covered for payment, and barrier railing plates.

380. Adler Water Booster Station, Item SPV.0105.5000.

A Description

This special provision describes the furnishing, delivery, and installation of the specified factory built station with all the necessary piping, controls, and appurtenances as shown on the plans; providing the building foundation as shown on the plans; excavating and backfilling in accordance to standard spec 206; proportioning, mixing, placing, and protecting concrete in accordance to standard spec 501; furnishing and placing reinforcement in accordance to standard spec 505; and as specified herein.

The factory built station shall be one piece when delivered and require off loading, installation on the foundation, fascia brick, soffit, gutters, pipeline and drain line hook up, and electrical power hook up by the installation contractor as shown on the plans and as specified herein.

Procurement of the factory built station is anticipated to be four months after shop drawing approval.

A.1 Station Manufacturer

The manufacturer of the selected factory built equipment shall be a business regularly engaged in the manufacture, assembly, construction, start-up and maintenance of water distribution equipment and controls of the type required for this project. The manufacturer shall have at least 10 years of successful experience in providing station, design, function and quality as required for this project to the municipal potable water market.

A.2 Electrical Design, Assembly and Test

The electrical apparatus and control panel design, assembly, and installation, and the integration of component parts will be the responsibility of the manufacturer of record for this factory built booster station. That manufacturer shall maintain at his regular place of business a complete electrical design, assembly and test facility to assure continuity of electrical design with equipment application.

A.3 Conformance to Basic Electrical Standards

The manufacturer of electrical control panels and their mounting and installation shall be done in strict accordance with the requirements of UL Standard 508A and the National Electrical Code (NEC), NFPA 70 latest revision so as to afford a measure of security as to the ability of the eventual Milwaukee Water Works to safely operate the equipment.

No exceptions to the requirements of these codes and standards will be allowed; failure to meet these requirements will be cause to remove the equipment and correct the violation.

A.4 U.L. Listing

All service entrance, power distribution, control and starting equipment panels shall be constructed and installed in strict accordance with Underwriter's Laboratories (UL) Standard 508A "Industrial Control Equipment." The UL label shall also include an SE "Service Entrance" rating stating that the main distribution panel is suitable for use as

service entrance equipment. The panels shall be shop inspected by UL, or constructed in a UL recognized facility. All panels shall bear a serialized UL label indicating acceptance under Standard 508A and under Enclosed Industrial Control Panel or Service Equipment Panel.

A photocopy of the UL labels for this specific project shall be transmitted to both the engineer and the contractor for installation within their permanent project files, prior to shipment of the equipment covered under these specifications.

A.5 E.T.L. Listing

All control panels shall be E.T.L. Listed by Interek Testing Services (ITS) under the Industrial Control Panel (ICP) Category. Each completed control panel shall bear an ETL listing label stating that the panel conforms to UL STD 508A and is certified to CAN/CSA STD C22.2 NO. 14. The listing label shall include the station manufacturer's name, address and telephone number. The station manufacturer shall have quarterly inspections performed by ETL at the manufacturer's facility to ensure that the products being listed comply with the report and procedural guide for that product.

B Materials

B.1 Booster Pump Station

The booster pumping station manufacturer shall be Engineered Fluid, Inc., Centralia, IL; Gorman-Rupp Company, Mansfield, OH; Precision Systems, Calumet City, IL or equal.

B.2 Shop Drawings

Prepare Shop Drawings for the factory built water booster station. Prepare in accordance to the following provisions as well as standard spec 105.2.

Submit checked detailed Shop Drawings, which include, but are not limited to, the following:

The submittals shall be bound in a minimum of four hard copies and one electronic copy, and contain at a minimum the following:

Mechanical Drawings: Fully to scale, 22" x 34" size plan sheets, showing all mechanical equipment and devices, and locations in a minimum of three views, showing plan, length, and width. These drawings shall be fully denoted as to sizing and dimensions, and illustrate working clearances.

Structural Drawings: Fully to scale, 22" x 34" size plan sheets fully dimensioned, denoted and project specific showing plan, length, and width views of all piping bracing, piping supports, and joint restraining devices, as to exact location, size of support, and restraint members, and methods of attaching; showing the base skid plan, structural reinforcing members including exact size, location, and method of attaching and the anchoring system. The structural drawing is to include the structural steel sizes or shapes to be utilized with weights and the total weight of all structural steel, piping, and components equaling the total weight of the proposed station.

Foundation Drawings: Fully to scale, 22" x 34", size plan showing the concrete foundation/pad required and reinforcing bar plan for the station, including anchoring detail required to counter the thrust of water hammer.

Equipment Component Listing: Provide a complete listing by manufacturer and full model number of all mechanical components to be used. Provide fully descriptive catalog sheets for each of the listed components.

Corrosion Protection: Clear drawings, notes and details showing surface preparation prior to welding, after welding, and prior to coating, priming and coating applications denoting treatment, coating application and method of testing the integrity of the application, all of these shown to meet or exceed the requirements of the specifications to be signed by an officer of the company.

Manufacturer Warranty Statement: A clear statement of the warranty to be provided as specified herein under "Warranty" to cover the station, and all devices and assemblies therein, so as to stipulate the station manufacturer as the only provider of the stipulated and specified warranty to cover all labor and material costs over the two year warranty life, said warranty statement to be signed by an officer of the company.

Factory Startup and Service Statement: A clear statement of the startup and service to be provided as specified herein under "Factory Startup Service" to cover the station, and all devices and assemblies therein, so as to stipulate the station manufacturer as the only provider of the stipulated startup and service to include all labor is to be by direct factory employees only, said startup and service statement to be signed by an officer of the company.

Certified Welding and Steel Statement: A clear statement that all structural and pipe welds shall be performed by certified welders only as specified herein, including copies of the current welding certificates of the station employees who are to perform the station welds. This statement is to include confirmation that new domestic (US) steel only shall be used in fabrication of the station, said statement to be signed by an officer of the company.

Standards and Agency Testing: List the standards and agency listing governing the fabrication, construction, assembly, and mounting of the components, assemblies and furnished as stipulated herein. This listing is to be signed by an officer of the company.

B.3 Factory Start-up Service

Start-up and warranty service shall be performed by the station manufacturer. No representative, contract service organization or third party of any sort shall be directed to perform such services.

- Start-up and warranty service technicians shall be regular factory direct employees of the station manufacturer.

- A total of 2 days for startup and 2 days for training on site is required 4 workers in each 8 hour shift.
- Start-up service to include four hard copies and two electronic O&M manuals for the station.
- Start-up service report attested to by start-up technician and representative of the Milwaukee Water Works or engineer. Milwaukee Water Works will inspect pump station and release for shipping.
- Service report distributed to:
- Manufacturer's File
- Engineer's File
- Contractor's File
- Milwaukee Water Works File

B.4 Training and Follow-up

The program for employee training shall educate all employees who will be required to operate and maintain the system. The objective of the training will be to provide a common working knowledge concerning all significant aspects of the system being supplied.

The training program shall consist of two 8 hour days working with the full set of employees (4) and (2) - 8 hour work shifts.

The supplier shall provide all materials, equipment, and manuals to conduct the training program.

B.5 Operation and Maintenance Manuals

The station manufacturer shall provide two complete electronic O&M manuals in pdf format containing as-built final system drawings and operating and maintenance information. The submitted manuals shall be sufficient to facilitate the operation, removal, installation, adjustment, calibration, testing and maintenance of each and all components and instruments.

B.6 Manufacturer Warranty

The warranty is the sole responsibility of the station manufacturer and that warranty shall be provided in written form covering the specified equipment and the O&M manuals provided with that equipment.

The warranty shall at a minimum cover:

- A period of 2 years commencing upon station startup.
- The 2 year period shall be inviolate regardless of any component manufacturer's warranty for equipment and components within the station.
- The warranty shall cover all equipment, components, or installation services, provided under this contract by the station manufacturer exclusive of those components indicated below or supplied by, and/or installed, by others independent of the control of the station manufacturer of record for this station and controls. Unauthorized startup, alteration, misuse, or items requiring replacement due to normal wear, are excluded.

- The warranty shall provide for the station manufacturer to bear the full cost of labor and materials for replacement and/or repair of faulty or defective components, on site as required so there shall be no cost incurred by the Milwaukee Water Works for this work during the warranty period.
- No assumption of contingent liabilities for any component failure during warranty is made.

"Second party" or "pass through" warranties will not be accepted.

B.6.1 Emergency Warranty Support Services
In addition to the onsite services outlined above during the warranty period, the station manufacturer shall provide 24 hour emergency support service via phone support.

B.6.2 Final Warranty Inspection
Prior to the end of the warranty period the engineer and the Milwaukee Water Works shall conduct an inspection and review of the station with the manufacturer of the system. A punch list shall be provided by the engineer and the Milwaukee Water Works indicating any deficiencies which must be corrected prior to release of the warranty for station manufacturer.

B.7 Third Party Inspection Listing (Stations 600V Max)
The station manufacturer shall be required to affix to the station an INTERTEK TESTING SERVICES (ETL) LABEL attesting to the compliance of the station equipment under PACKAGED PUMPING SYSTEMS. The ETL label shall state the station conforms to UL STD 778 and is certified to CAN/CSA STD C22.2 NO. 108.

B.8 Station System Acceptance
Station system acceptance shall be defined as that point in time when the following requirements have been fulfilled:

- All O&M documentation has been submitted, reviewed, and approved by the engineer and the Milwaukee Water Works.
- The startup of the station system and controls and successfully completed all testing and operational requirements specified.
- All training as specified has been completed.
- A full warranty statement as specified herein with the warranty commencement date (date of acceptance by the Milwaukee Water Works) spelled out shall be presented to the Milwaukee Water Works. The warranty statement shall clearly identify the station manufacturer as responsible for warranty service.

B.9 Building Criteria
The station building enclosure shall be a factory assembled, modular structure of one compartment all attached to the station base structure and requiring no additional assembly at the job site.

The building design criteria shall be:

- To withstand snow load based on ASCE 7-05 Ground Snow Loads for the state and county of installation.
- To withstand wind loads based on ASCE 7-05 for wind speeds.
- Be designed for site specific seismic requirements based on local conditions as dictated by the Available Ground Motion Parameters according to ASCE 7 and IBC 2006 and 2009 established by zip code and a live floor load of 125 PSF.

The building specified shall be of the size shown on the drawings. Building sizes less than those shown will not be allowed.

B.10 Building Construction

Insulation values for the walls and roof structure shall be a minimum R-19 in the walls and R-36 in the roof. Insulation within the roof and wall panels shall be foam-in-place polyurethane material applied between the interior and exterior sheathing forming a closed cell bounded by the steel framing. The insulation shall have a minimum density of 2.2 lbs/cu. ft. nominal and shall be applied to the thickness required to provide a minimum R value of 21. The insulation shall have an ASTM E-84 flame spread index of 25 and smoke developed of 450.

Building framing materials shall comply with the A.I.S.I. Specification for the Design of Cold-formed Steel Structural Members and to Standards ASTM C-955, ASTM C-1007, ASTM C-645, ASTM C-754 and ICBO 4782P. and 4784P.

Metal-clad, foam insulated panels or SIPS will not be allowed.

The building structure shall be fabricated using steel C-studs as wall framing members and C-joists for roof support. The wall C-studs shall be a minimum 2" x 3 5/8" of 20 gauge material minimum. The roof C-joists shall be a minimum 1-5/8" x 8" size of 16 gauge material minimum.

The exterior vertical wall sheathing shall be 22 gauge galvanized steel.

The interior wall and ceiling sheathing shall be 5/8” exterior rated gypsum.

The exterior roof sheathing, comprising of the trussed roof system, shall be 9/16” USF decking.

Plywood, OSB or particle board will not be allowed for the building interior or exterior walls, interior ceiling or roof decking.

All interior wall and ceiling surfaces shall be covered with .090" thick FRP (fiberglass reinforced plastic) sheeting of pebble grain, gloss, white finish. The individual wall faces shall be covered with one continuous sheet. The FRP sheets shall be glued to the gypsum sheathing requiring no fasteners.

Fascia and soldier course accent bricks shall conform to ASTM C216 Grade SW Type FBX and be modular size with a height of 2-1/4 inches, a length of 7-5/8 inches, and a width of 3-5/8 inches. Fascia brick shall be Sioux City Brick: Fine Arts, Brampton Brick: Brown Velour, Palmetto Brick: Charcoal Wirecut, or equal. Soldier course accent brick shall be Sioux City Brick: Clear Buff, Brampton Brick: Salmon Velour, Palmetto Brick: Buffstone Wirecut, or equal.

Prior to ordering fascia and soldier course accent bricks, supply one 4-foot by 4-foot stacked sample of the fascia brick and one 2-foot by 2-foot stacked sample of the solider course accent brick to the engineer for approval by the Milwaukee Water Works, Mr. Anthony Fahres, (414) 286-2428.

B.11 Heavy Duty Steel Doors

Doors, single and double leaf and of the size shown on the building plan, shall be heavy duty galvanized steel metal door, ASTM F476 Grade 40 high security level per (ASTM 2002) All doors shall be full flush construction and 1-3/4 inches thick. Doors shall be reinforced, stiffened, insulated, and sound deadened with a solid polystyrene foam board permanently bonded to the inside of each face skin. The exterior side of the doors shall have an astragal or lock guard. The lock and hinge edge of each door shall be welded with a center hairline seam the full height of the door. The lock edge shall be reinforced full height by a 14-gauge continuous one-piece channel extruded tinplating. The hinge edge shall be reinforced full height by a 14-gauge continuous one-piece channel, formed and tapped for hinges. Top and bottom of the door shall be closed with 16-gauge channels. Doors shall be thoroughly cleaned and receive an iron phosphate treatment prior to receiving one coat of prime paint. Door closures and rim panics are reinforced with 14-gauge channels.

Doors shall be fully-mounted in frames produced for pre-hanging of commercial 1-3/4" doors. Frames are formed to 16-gauge commercial quality cold rolled steel conforming to ASTM A366 or A620 and A568. Frames are produced in two welded units, to be mechanically joined during installation and filled with concrete along with face brick installation. The base side is prepared for all required hardware. Both units, base and trim, are furnished with welded mitered faces. Frame anchoring includes compression anchors and stud screws. Door hinges shall be continuous gear hinges, fabricated of extruded 6063-T6 aluminum alloy/temper with pinless assembly. The doors shall have a classroom function lockset able to receive a Schlege Primus cylinder, exterior handle, and top mounted-door closer with hold-open device.

Doors and frames shall be finished with a two-component, industrial enamel coating, blue in color to match roof, with a high gloss finish. The coating shall be resistant to a wide range of solvents and chemicals under splash and spill conditions. The coating system is V.O.C. compliant.

Door sizes and locations are as shown on the drawings.

B.12 Factory Installed Trussed Roof System
The building manufacturer shall provide roof trusses and UFS 9/16” decking to be factory applied and covered by the metal roof surface to form a hip roof system as shown.

Each roof panel shall be 16” wide ribbed. The panels shall meet UL Standard 2218, Class 4 impact resistant and Class A fire resistant rating. The system shall be complete with fascia and soffit. The minimum roof slope shall be 4:12.

B.13 Traveling Bridge, Chain Hoist and Trolley
The hoist shall be rated for 2,000 lbs. with 12' of lift. A Weston-type load brake shall be supplied that requires no lubrication. To minimize jamming and slipping, the hoist shall be supplied with hand wheel covers with guide slots. The chain will be hardened. The hook shall be forged steel, equipped with a safety latch and swivel.

The trolley shall be manufactured of high quality rolled steel. The wheels shall be double row, ball bearing design for greater wear capacity. The bearings shall be pre-packed with lifetime lubricant and protected with dust covers. The trolley shall quickly adapt to a wide range of beams with the “Dial-Fit” collar system. The trolley beam shall be a "W4x13" flange steel I-beam conforming to ASTM-A36 standards.

B.14 Delivery – Lifting Device
An adjustable spreader type lifting device, built to lift the building structure without impinging the lifting chains/cables on the building sidewalls, shall be provided by the pumping station manufacturer for use by the installing contractor for the purpose of unloading station from trailer.

B.15 Building Substructure
The base/floor system substructure shall be made up of steel plate and standard structural steel shapes of the sizes and weights sufficient to bear the loading placed on the base by shipping and operation.

Design the substructure to support the building live and dead loads plus the burden imposed by loading, transporting and unloading of this equipment.

All steel plates used in the substructure shall meet or exceed the requirements of ASTM-A36. The structural shapes (channels and angles) shall be of the thickness/weight as shown on the plans for this item and shall meet or exceed the requirements for ASTM A-36. The structural rectangular or square tubing shall be of the wall gauge as shown on the plans for this item and shall meet or exceed the requirements for ASTM A-500 Grade B.

On the substructure on the floor plate, indented approximately 8”, there shall be welded a 1-1/2” x 2” x 1/8” steel angle iron with drilled holes. This angle steel piece shall be the bracket through which the building is attached to the base substructure.

B.16 Skid Insulation
Insulate the steel skid underside with an isocyanurate (flame retardant urethane) foam insulating material. The insulation shall be 2 inches thick and have a minimum density of 1.7-1.8 lbs/cu. ft. nominal. The insulation shall have an ASTM E-84 flame spread rating of less than 30.

B.17 Safety Floor Matting
Provide a medium duty rubber drainage runner with a 1/2 inch minimum thickness of open slot design allowing fluids to drain under walking or standing surfaces. Provide a runner with a tread design to promote sure footing. The underside of the runner shall have a raise knob design to permit aeration and drainage.

B.18 Pump Operating Conditions – Pump Station
The pump station shall be capable of delivering the fluid medium at the following capacities and heads when operating at 0 feet minimum suction pressure.

PUMP(S) #1, #2, AND #3

The pumps shall be Close Coupled End Suction by PACO as Model 50123 LC.

Design Point: 1100 GPM @ 70 feet TDH;
Maximum Point: 1750 GPM @ 40
Suction Pressure: 60 PSI;
Discharge Pressure: 90 PSI;
Pump Efficiency at Design Point: 80%
Pump Power: Non-overloading for 30 rated HP.
Motor: 1800 RPM nominal, 480V, 3 Phase

B.18.1 Pumps – Close Coupled Horizontal End Suction, Centrifugal
The pumps employed within the pump station shall be of the close coupled, horizontal end suction, centrifugal configuration.

The pumps shall be of close grain cast iron construction complete with bronze trim. The pumps shall conform to the detailed specifications as set forth below:

The pumps shall be Volute style with the pump casing bolted to adapter, with recessed lock fit to ensure alignment. No stud or bolt holes are tapped through casing to liquid ways. Tapping openings provided for priming, venting, draining and suction and discharge gauge connections. Piping connections are to be as shown on the pump data sheets.

Impellers are to be single suction type, cast in one piece. All impellers are to be statically balanced to ensure smooth operation, also hydraulically balanced except in some small sizes where end thrust is but a minor factor.

Wearing rings shall be renewable, be set on both the impeller and body and be set maintain proper running clearance with impeller hubs to minimize leakage between the suction and discharge.

Shaft sleeves shall be shouldered onto the shaft near impeller to cover the full length of shaft from impeller hub to motor end bracket by being in compression over the shaft protecting shaft from contact with liquid.

The stuffing box shall be cast integral with the pump casing. The stuffing box shall contain a single face type mechanical seal. The seal shall have a carbon rotating head against a Ni-Resist stationary face and be complete with a Buna-N boot with stainless steel spring and spring retainer.

The motor adaptor shall maintain a rigid, bolted, registered assembly between motor and the casing by a machined lock between adapter and motor end bracket keeping the adapter and casing in permanent alignment with motor and motor shaft.

Motor configuration shall be as a close-coupled assembled as an integral part of the complete units. The extended motor shaft carries the impeller and shaft sleeve. Motor bearings are ball bearing type, designed to carry all radial and thrust loads, and are installed in sealed housings which retain lubricant and exclude dirt and moisture.

B.18.2 Pump/Motor Vibration Isolation Pads

The pump/motor assembly shall be mounted to a fabricated steel base built specifically for the pump/motor to be mounted. Each mounting or attachment point shall be complete with a vibration isolation pad. The pad will be in two parts, a 1/4" base layer followed by a 5/8" upper layer and be a nominal 2" x 2" square size for pump/motor combinations weighing up to 1500 pounds.

B.18.3 Pump Support Stands

The pump support stands shall be weld fabricated of structural and plate steel with double “H” configuration of solid, continuous legs and double webbing between the legs for rigidity. The base of the legs shall be flanged and continuously welded to the steel floor. The upper end of the legs shall be flanged and continuously welded to a 3/8” thick pump motor leg bolt-down plate.

B.18.4 Pump Motor Configuration

The pump driver shall be a NEMA Design B, three phase, alternating current, induction motor, continuous duty rated, with motor insulation as Class F for Class B Heat Rise.

Motor efficiencies shall be Premium Efficient as stated in NEMA MG 1, 2011 Part 12, Table 12-12 for the motor enclosure, open or closed.

Motor Service factor shall be 1.15 on the nameplate, reduced to 1.0 when used with variable frequency drives per NEMA MG 1 – 2011, Part 31.3.7.

The motor enclosure shall be Open Drip Proof (ODP).

Motors of 600 volts or less shall meet the requirements of NEMA MG 1 2011 Part 31.4.4.2 for ability to sustain voltage spikes when used with variable frequency drives under usual conditions

B.19 Piping - Transmission
The piping shall conform to AWWA Standard C-200.

Piping shall be steel and conform to material specification ASTM A-53(CW) for nominal pipe size 4 inch and smaller and ASTM A-53(ERW) Grade B for nominal pipe size 5 inches and larger. Steel butt-welding fittings shall conform to material specification ASTM A-234 Grade WPB and to the dimensions and tolerances of ANSI Standards B16.9 and B16.28 respectively.

Forged steel flanges shall conform to material specification ASTM A-105 Class 60 and/or ASTM A-181 for carbon steel forgings and to the dimensions and tolerances of ANSI Standards B16.5 as amended in 1992 for Class 150 and Class 300 flanges.

The piping sizes shall be as shown on the drawing:

- Size 10 inch and below - Schedule 40
- Size 12 inch through 20 inch - Standard weight (.375" wall)
- Size 24 inch and above - Standard weight (.500" wall)

B.20 Welding Wire
In all cases, use welding wire with a minimum tensile strength of 70,000 psi.

B.21 Pipe Supports
Pipe supports by minimum sizing for:

- 8" and smaller piping shall be 2" x 3" x 3/16" wall rectangular tubing;
- 10" and larger piping shall be 3" x 4" x 1/4" wall rectangular tubing;
- 6" and larger piping shall be provided with "kick" bracing projecting fully from the underside of the pipe to the floor at an angle of no less than 15E from vertical out at a right angle to the run of the pipe being supported. These "kick" braces shall be in addition to the vertical pipe supports called out above.

B.22 Fusion Bonded Epoxy Internal Pipe Coating
The powder coating product shall be National Sanitation Foundation (NSF) Standard 61 certified material.

Test	Requirement	Results
Specific Gravity	1.2 – 1.8	1.37 g/mL
Sieve Analysis	<2.0% on 100 mesh	0.14%
Gel time @ 400˚F	7-150 seconds	25 seconds
Thickness	12-16 mils	12-16 mils
Impact	>100 in/lb	>100 in/lb
Appearance	Smooth and defect free	Smooth, defect free
Bendability	Pass 2.4 inch bend	Pass 1.8 inch bend
Shear Adhesion	>3000 PSI	5300 PSI
Penetration	<10%	8%
Abrasion Resistance	<0.300 grams loss	0.15 gram loss
Water Soak	1-3 Rating	1 Rating
Volume Resistivity	>1.1x10e15	2x10e15
Dielectric Strength	>1000 V/mil	1160 V/mil

The epoxy powder coating shall be ELS8-800 Blue Epoxy Coating, latest revision from Valspar, Inc.; Tnemec; Sherwin-Williams.

Prior to shipment of the station, the station manufacturer shall provide in writing to the engineer certification that the fusion bonded epoxy coating has been applied to all internal surfaces of the steel piping using the proper method. Said certification shall show under the station manufacturer's letterhead:

- Date of application;
- Material manufacturer and product designation including a product data sheet for the coating;
- Applier of the fusion bonded coating, name, address and phone number;
- Signature of an officer of the station manufacturing company stating the fusion bonded epoxy coating was applied to AWWA Standard C213-91 or the latest revision.

B.23 Elastomer Pipe Connector

The elastomer connector shall be of single sphere design, constructed of neoprene and nylon with bias-ply tire reinforcing cord to provide a 225 psi working pressure rating to a minimum of 120 degrees F.

B.24 Line Pressure Gauges

Combination pressure gauges shall have a built-in pressure snubber and have 4-1/2" minimum diameter faces and turret style case, black fiberglass-reinforced thermoplastic with a clear acrylic window with Buna-N gasket. The movement shall be rotary; the bourdon tube shall be copper alloy C-type. The gauge shall have a 1/4" MNPT lower mount process connection and contain a 0.6mm copper alloy restrictor.

Gauge ranges, markings and gauge location shall be identified in the submittal documents.

B.25 Static and Sensing Lines
All gauge, switch and transmitter sensing lines shall be minimum 1/4" OD white polypropylene tubing run from the sensing point and a ball valve to the point of device mounting.

B.26 Valves
B.26.1 Ball Valves
For piping of less than 3" size ball valves shall be used. The ball valves shall meet or exceed ASTM Spec B124 No. C37700. The ball valves will be 2-piece forged brass body, blow out proof stem, TFE seats, TFE packing with adjustable stem packing gland. The valves will be NPT threaded pattern complete with lever operators. Maximum working pressure shall be 600 psi.

B.26.2 Butterfly Valves
Provide butterfly valves in accordance to AWWA Standard AWWA C504, latest revision, as Class 150B.

The flanged body shall be ASTM A125 cast iron for 150 psi working pressure.

The flanged valves shall be full faced and drilled in accordance to ANSI Standard B16.1, Class 125.

The valve disk shall be Class B cast iron or ductile iron for 150B valves.

Valve seals shall be either seat-on-body or seat-on-disk.

Valve shafts shall be through shafts and be of the stainless steel.

The valve body shall be coated internally with two-part alkyd epoxy conforming to NSF061.

Valves shall be by Pratt; Val-Matic; Mueller or equal.

B.26.3 Silent Check Valves – Globe Style
Silent check valves shall be globe style, non-slam and made to set between ANSI Class 125 flanges.

Sizes shall be as shown. (2" – 10")

The body of the check valve shall be cast iron. The plug and seat shall be bronze and conform to ASTM Designation B-584. The seat shall contain a Buna-N seal to provide zero leakage. The seal design shall provide for both a metal to metal low and high pressure without over-loading or damaging the Buna-N seal. The guide bushings shall be bronze copper alloy and conform to ASTM Designation B-584. The valve spring and seat retainers shall be stainless steel and conform to ASTM Designation A-313. The valve plug

shall be guided at both ends by a center shaft integral with the valve plug. Alignment of the center shaft shall be provided by guide bushings.

Silent Check Valve manufacturer:

A. Val-Matic Model 1800
B. APCO
C. Mueller

B.26.4 Meter Isolating Gate Valve

The meter inlet isolating valve as shown shall be a full ported gate valve meeting AWWA Standard C-509 with cast iron body, resilient seat and non-rising stem with handwheel operator, opening left.

The valve body shall be flanged and drilled to ANSI B16.1, Class 125.

Valve maximum working pressure rating shall be 200 psi.

Valve manufacturer:

A. M&H 4067-02
B. Mueller A-2360-6
C. APCO

B.26.5 Hydraulic Actuated Control Valves – General

The valve configuration as shown shall be hydraulically operated, single diaphragm actuated. The valve shall consist of three major components: the body with seat installed, the cover with bearing installed, and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls. Valve body and cover shall be epoxy coated. The stainless steel seat with integral bearing shall be of the solid, one piece design.

The diaphragm assembly shall contain a non-magnetic stainless steel stem of sufficient diameter to withstand high hydraulic pressures. The stem shall be fully guided through its complete stroke by a removable bearing in the valve cover and an integral bearing in the valve seat. No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary.

The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully open or fully closed position.

The pilot control system shall include CK2 isolation valves.

The pilot system shall include closing speed control on all valves.

Pilot controlled sensing shall be upstream of the pilot system strainer so accurate control may be maintained if the strainer is partially blocked.

The pressure relief pilot shall be a direct-acting, adjustable, spring-loaded, diaphragm valve designed to permit flow when controlling pressure exceeds in the adjustable spring setting. The pilot control is normally held closed by the force of the compression on the spring above the diaphragm and it opens when the pressure acting on the underside of the diaphragm exceeds the spring setting. The pressure relief valve shall be supplied with the Dura-Kleen® stem (KD option).

The Control Valve shall be a Cla-Val Model 50-01BKCKD.

B.27 Magnetic Flow Meter

The magnetic flowmeter shall be microprocessor-based, and flanged. It shall indicate, totalize, and transmit flow in full pipes.

The magnetic flowmeter shall utilize DC bi-polar pulsed coil excitation, automatically re-zeroing after every cycle.

The accuracy shall be ±0.25% of rate for velocities greater than 1.64 feet per second.

The electrode material shall be Alloy C; liner material shall be hard rubber; pipe spool shall be 316 stainless steel; meter housing material shall be carbon steel welded classification NEMA 4X.

Flanges shall be ANSI B16.5 class 150 raised flange carbon steel.

Coil power shall be pulsed DC.

The flowmeter shall be furnished with grounding rings.

A 4 x 20 character display with backlight shall indicate user-defined flow units and total flow. The amplifier shall be unidirectional or bidirectional with two separate totalizers. Analog output shall be 4-20 mA along with four digital outputs. The meter shall have empty pipe detection. The meter shall have RS232/RS485 Modbus RTU, Hart, and Profibus DP communication. All programming of the meter shall be through three buttons on the amplifier.

THE MAGNETIC FLOW METER SHALL BE BADGER METER MODEL M2000.

B.28 Electrical

B.28.1 Panel Mounting Hardware

Metal framing channel and hangers shall be used exclusively for mounting of electrical panels and electrical components except for those specifically designated otherwise.

B.28.2 Electrical Service

The electrical service provided for this station will be 480 volt, 3 phase, 60 Hertz, 4 wire.

B.28.3 Metering Pedestal

Provide a WE-Energies-approved metering pedestal. The pedestal shall be constructed of 14-gauge zinc-coated steel with a baked-on alkyd resin paint. The pedestal shall be complete with line connectors, meter socket per WEPCO standards, open-faced at bottom and removable upper panel, and load lay-in connectors. Refer to the latest revision of the Electric Service and Metering Manual. Note that a course of bricks will be added to the exterior of the building as shipped and the brick work may be done after the installation of the pedestal.

B.28.4 Electrical Distribution Panel

The distribution panel shall be a single section, bolt-on panelboard, bottom feed, surface mount, SE rated, NEMA 1 enclosure for three phase, four wire, 480 VAC power and with copper bus. Circuit Breakers are rated for 10 KAIC.

The main circuit breaker shall be rated for 200 amp service.

The distribution panel shall be complete with the following branch circuit breakers:

One 3-pole, 200 amp main breaker;
Three 3-pole, 80 amp domestic pump motor breakers;
One 3-pole, 30 amp surge protection breaker
One 3-pole, 30 amp primary transformer breaker;
One 3-pole, 30 amp HVAC breaker.

Nameplates will be provided in etched phenolic.

B.28.5 Ground Ring

Provide a bare 2/0 copper conductor ring as a grounding electrode conductor, around the building foundation.

B.28.6 Electrical Power Transformer

Balanced 460/208-120v three phase power for the lighting panel within the scope of each booster station shall be obtained by use of a 10 KVA dry, step down transformer. The transformer shall be wall mounting type, in a NEMA 3R non-ventilated weatherproof enclosure. Transformer shall operate with noise levels equal to or less than ANSI and NEMA standards. Transformer insulation shall be Class 180c.

The transformer shall meet the most recent standards for efficiency.

The unit shall be "UL" approved for indoor/outdoor application.

B.28.7 Electrical Lighting Panelboard

Provide circuit breaker panelboards meeting standards established by UL, NEMA PB-1, and the NEC. Provide panels rated for connection to an electric system having an available RMS symmetrical short circuit current of 10,000 amperes at 120/208V.

Furnish boxes large enough to provide a minimum wiring gutter space on both sides and top and bottom of 4 inches by 4 inches minimum. Provide flush- or surface-mounted boxes as indicated manufactured of code gauge, hot-dip galvanized sheet steel. Utilize front trim the same size as the box for surface-mounted panelboards and 3/4 inch larger all around than the box for flush-mounted panelboards. Provide sheet steel fronts finished with a prime coat of rust inhibitor and the manufacturer's standard baked enamel or lacquer finish and utilizing adjustable clamps as the means for fastening the front to the boxes. Utilize fronts having doors with concealed hinges and flush type lock and catch device. Provide multi-point locking devices for all doors over 30 inches in height. Furnish two milled type keys with each lock. Mount on door a metal directory frame with transparent plastic face and enclosed directory card. Furnish an engraved, laminated plastic nameplate screwed (no adhesives) to the cabinet exterior face indicating the panelboard designation, service voltage, and phases.

Utilize panelboard interiors that are factory assembled complete with circuit breakers as indicated. Furnish circuit breakers in positions where diagram or schedule indicates SPARE. Furnish only complete provisions for future circuit breakers where diagram or schedule indicates SPACE, and cover the resulting opening in the cabinet front with an easily removable metal cover. Utilize panelboards with interiors designed so that circuit breakers can be replaced without disturbing adjacent circuit breakers or without removing the main bus.

Provide bus bars of copper, sized in accordance to UL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C above an ambient of 40 degrees C maximum. Make complete provisions for mounting future circuit breakers throughout the full length of the bus provided regardless of number of units and spaces called for. Provide all machining, drilling, or tapping required to add or change circuit breakers in the future.

Furnish an insulated neutral bus bar rated the same as the phase bus bars and having at least one terminal screw for each branch circuit. Furnish a copper ground bus bar installed on the panelboard frame, bonded to the box, and containing at least one terminal screw for each circuit. Provide solderless main lugs for main, neutral, and ground bus bars. Make all lugs and connection points on phase, neutral, and ground busses suitable for copper or aluminum conductors.

Provide the following circuit breakers:

3P/30A Main breaker
3P/15A Phase monitor
1P/15A Control Panel
1P/15A Telemetry Panel – Dedicated receptacle for UPS
1P/20A Receptacles (Easterly and Southern walls)
1P/20A Receptacles (Northerly and Western walls)
1P/15A Lighting
1P/15A Dedicated to dehumidifier
1p/20A Spare
1P/20A Spare
3 Minimum Spaces

B.28.8 Discrete Suction Pressure Control Panel

Separate from the control logic, suction control of the pumping operation shall be provided by a bellows type, adjustable differential pressure switch. The switch shall be complete with a single pole, double throw contact block with 5 amp non-inductive rated contacts at 230 volts AC. The set points of the on/off cycle shall be independently adjustable through the full range of the switch rating.

1. Low Suction Cut-out, 4-150 psi.
1A. Adjustable Differential, 2-25 psi.

Provide solid state time delay relays having an adjustable time range of 10 seconds to 10 minutes. The relays shall be constructed to use a DIN rail mount socket so that the relays can be replaced without disturbing the wiring. The relay shall be complete with LED indicators for output and power. The switch and time delay relays shall be housed in a NEMA 12 enclosure.

Time Delay Relays

- Low Suction Timer (Minimum on)
- Low Suction Timer (Minimum off)

B.28.9 Electrical Phase Monitor

A phase monitor shall be supplied to protect three-phase equipment against phase loss, undervoltage and phase reversal conditions.

When a fault is sensed, the monitor output relay opens within two seconds or less to turn the equipment off and/or cause an audio or visual alarm. Both Delta and Wye systems may be monitored. The monitor shall have an automatic reset and shall also include an adjustable voltage delay.

The monitor shall have an indicator LED (glows when all conditions are normal and shall monitor phase sequence: ABC operate (will not operate CBA). The phase monitor shall be UL approved and CSA certified.

B.28.10 Electronic Pressure Indicating Transmitters

Provide for both the 1) pump station suction header and 2) the pump station discharge header. Both ranges to be 0-150 PSIG.

Manufacturer shall be Endress & Hauser, Model PMD78. Unit shall sense positive or negative pressures and shall be an electronic, two-wire, force transfer type transmitter with wetted parts of 316 stainless steel unless noted otherwise. Provide seals for hygienic processes. Measure process fluid is potable water. Process connections shall meet the requirements of 3A-Sanitary Standard No. 74 and certified by the European Hygienic Engineering and Development Group.

Process temperature range shall be: -20 degrees F to +120 degrees F minimum.Dampening: Fluid or electronically dampened with dampening adjustment. Output shall be 4 to 20 mA dc signal into a load impedance of 0 to 750 ohms with 24V dc supply and HART compatible. Range shall be adjustable and as noted above with no suppressed or elevated zero unless noted otherwise.

Accuracy shall be +/- 0.5 percent of calibrated span or better with a hysteresis and repeatability of 0.5 percent of calibrated span maximum. Enclosure to be NEMA 7 construction, unless otherwise noted.

Units shall be provided with brackets for pipe stand mounting. Units shall be provided with isolation valves for rigid calibration. Provide a 24V DC power supply for the transmitters. Supply power to be 120V, 1 phase and mounted in the telemetry interface panel.

B.28.11 Electrical Apparatus – Adjustable Frequency Drives

The variable frequency drives (hereafter referred to as VFDs) required under this Section shall be the low voltage pulse width modulated type. Variable frequency drives shall be designed, built and tested in accordance to the latest applicable editions of ANSI/IEEE, NEMA, UL, and NFPA. The variable frequency drives shall be UL listed.

VFDs specified shall employ a switching frequency pattern to minimize dV/dT related problems by preventing pulsed switches from adding due to timing of PWM waveform.

The VFDs shall be matched to the specific load requirements for each system, based on motor amp and horsepower calculations provided by driven equipment manufacturer. Motor terminator circuits must be available for long lead length applications.

Each VFD shall be provided with a free floor standing or wall mount enclosure with front access, suitable for mounting all components required of a given unit.

Enclosures shall be provided to meet NEMA /UL type 1.

Each enclosure shall provide adequate cooling for the components within and shall include positive ventilation. All enclosures shall be equipped with a fan control scheme to reduce filter maintenance, increase fan life, decrease audible noise and save energy. This is to be accomplished by employing a control relay to disable enclosure fans when drives are not in run mode.

Each enclosure door shall have a mounted operator interface / digital keypad and display.

B.28.11.1 General

The adjustable frequency controller shall be microprocessor-based, pulse width modulated design with switching logic power supply operating from the DC bus. The controller shall produce an adjustable AC voltage/frequency output so to vary the speed of the driven equipment. User Interface shall be common for all horsepower ratings The controller shall consist of the following sections:

- The controller switching frequency shall be adjustable and permit standard operation at 5,000 Hertz or less. The switching technology shall also include a scheme specifically design to reduce the dV/dT of the output supply.
- The controller shall be equipped with a minimum of a 3 percent DC bus reactor or input line reactor.
- The controllers' solid state converter input rectifier devices shall have a 1600 volt PIV rating.
- The controller shall have an overload rating of 110% variable torque, 150% constant torque for one minute.
- Controller shall be able to withstand repeated output terminal line-to-line short circuits without component failure.

B.28.11.2 Environment

- The controller's operating criteria shall be in accordance to the following:
- Operational ambient temperature range, 0°C to 40°C. Storage ambient temperature range: -40º C to 70º C (-40º to 158ºF). The relative humidity range is 5% to 95% non-condensing.
- Operational humidity, up to 90 percent non-condensing.
- Altitude, below 3,300 feet above sea level.
- De-rating values for operation above 3,300 feet.
- Nominal frequency, 60 Hertz plus or minus 3 Hz.
- Shock: 15G peak for 11ms duration.
- Vibration: 0.152 mm (0.006 inches) displacement, 1G peak.

B.28.11.3 Input Power

- The drive(s) shall be supplied as 6 pulse in configured packages. Nominal voltage, 480 volts plus ten percent or minus five percent, 3-phase, 3 wire. The controller shall include an under-voltage feature to permit trip-free operation down to 35 percent under-voltage.

- Displacement power factor for 6 pulse converters shall be limited to between 1.0 and 0.95, lagging, over the entire speed range.
- The drive shall include an MOV protection - phase to phase and phase to ground with provisions to remove ground connection if needed.

B.28.11.4 Features

1. The controller shall have features in accordance to the following:
    a. Digital keypad and display module shall provide parameter setting, adjustments and monitoring of control functions and faults. Display messages shall be in English.
    b. Independent acceleration/deceleration settings providing separate adjustments to allow either setting to be adjusted from 0.0 seconds to 3600.0 seconds. A second set of remotely selectable Accel/Decel settings shall be accessible through digital inputs. Programming capability shall allow the user to produce Accel/Decel profiles with linear or "S-Curve" characteristics that provide changing Accel/Decel rates.
    c. Power loss feature shall allow logic ride through capability.
    d. Time delay automatic restart shall allow restart after resettable controller fault conditions with programmable attempts.
    e. Coasting motor restart shall permit the controller to restart into a coasting motor without damage or tripping. The coasting motor restart feature shall allow switching from bypass mode to VFD mode while operating, without shutdown.
    f. Control inputs and outputs shall be isolated.
    g. An Economizer feature shall automatically reduces the output voltage when the drive is at a constant speed and partial load. The reduced voltage will minimize flux current in a lightly loaded motor and reduce kW usage. If the load increases, the drive shall automatically return to normal operation.
    h. Three adjustable set points shall be available to lock out continuous operation at frequencies, which may produce mechanical resonance. Set points shall have a bandwidth adjustable from 0Hz to 60Hz.
    i. A user programmable restart function shall be provided to automatically restart the equipment after restoration of power after an outage. A maintained 2-wire start input shall be required for this function.
    j. Start-Up Routines shall be included in the controller to allow the user to commission the drive quickly and accurately.
    k. A sleep / wake mode feature shall provide the capability to use an analog input as a Start – Stop command. This shall be a separate input or the speed reference. A signal level below the "sleep" level shall act as a stop command and signal level above the "wake" level as a start command. Sleep / wake time and level shall be fully programmable.

2. The controller shall have protective functions in accordance to the following:
    a. Input line side MOV (metal oxide varistor) transient protection.
    b. Electronic over-current trip instantaneous and inverse time overload protection.
    c. Over-temperature protection.
    d. Current limit trip protection.
    e. Input line over and under voltage trip protection.
    f. Ground fault trip protection.

B.28.11.5 Output Power

1. The output voltage shall be adjustable from 0 to rated motor. The inverter section will produce a pulse width modulated (PWM) waveform using IGBTs.
2. Drives shall have software to limit the reflected wave due to long cable lengths to a maximum of 2.25 times the bus voltage or 1600V, whichever is less, up to cable lengths of 600ft (183m).
3. Standard on all ratings up to 200HP; Common Mode Capacitors with jumpers for removal when used on an ungrounded system or resistive grounded system. Internal Common Mode Cores on the drive output.
4. Drive shall have a programmable current limit from .1 amps to 150% of drive rated amps. Current limit shall be active for all drive states including accelerating, constant speed and decelerating. Both the source of the current limit value and the gain for responsiveness adjustment shall be programmable. The drive shall employ a PI regulation scheme with an adjustable gain for smooth transition in and out of current limit.
    a. Output current shall be available as follows:
        Normal Duty ratings:
        110% Overload capability for up to 1 minute
        150% Overload capability for up to 3 seconds
        Heavy Duty ratings:
        150% Overload capability for up to 1 minute
        200% Overload capability for up to 3 seconds
5. The drive shall provide UL Listed Class 10 motor overload protection to comply with N.E.C. Article 430. Overload protection shall be speed sensitive and adjustable. To accommodate a variety of motors with different speed range capabilities, the frequency at which the overload begins to derate shall be programmable. A minimum of two different levels of accumulated overload shall be signaled as alarm conditions. A parameter shall be available to directly read the level of accumulated overload.

B.28.11.6 Control / Logic

Drive controller shall have the following capabilities:

1. Operation of the drive with motor disconnected.
2. Controlled shut down with no component failure in the event of an output phase to phase or phase to ground short circuit and annunciation of any fault condition.
3. Thermal manager to sustain operation and provide full protection of the power devices by reducing PWM frequency and output speed as needed.
4. PWM carrier frequency shall have a default setting with capability for adjustments within a range of 2-10 kHz (Output current de-rating is permitted for operation with carrier frequencies set higher than default.)
5. Multiple programmable stop modes including: Ramp, Coast, Fast Brake, DC-Brake, Ramp-to-Hold and S-curve.
6. Multiple acceleration and deceleration rates.
7. All adjustments to be made with the door closed.
8. Adjustable output frequency up to 420 Hz.
9. The digital interface shall be used for all set-up, operation and adjustment settings. All adjustments shall be stored in nonvolatile memory (EEPROM). No potentiometer adjustments shall be required. The drive shall provide EEPROM memory for factory default values.
10. The last eight fault codes shall be stored in the fault buffer. In addition, information about the drive's condition at the time of the last fault such as operating frequency, output current, dc bus voltage and other status conditions shall be stored at the time of fault. Information shall be maintained in the event of a power loss. The last eight alarm codes shall also be stored for additional troubleshooting reference.

B.28.11.7 Operator Interface

Interface to the drive shall be provided via a removable Human Interface Module (HIM) with integral display. This unit must have a minimum 7-line by 21-character backlit LCD display with graphics capability to display drive operating conditions, fault / alarm indications and programming information with full text support in multiple languages, including but not limited to English, German, French, Italian, Spanish, Portuguese and Dutch. The drive must also be capable of displaying all speed values in either Hertz or RPM.

The keypad shall include programming keys, drive operating keys (Start, Stop, Direction, Jog and Speed Control), numeric keys for direct entry and an ALT (alternate function) key to allow common drive programming or operating functions to be accessed directly.

B.28.11.8 Hard-Wired I/O

The following hardwired I/O shall be provided as a minimum:

1. Analog I/O:
   a. (Two) differential, isolated ±10V (bi-polar) / 20mA analog inputs , 11 bit plus sign, 160V common mode noise rejection with both Inputs fully user programmable for uses including; frequency command, process loop inputs and others. Inputs are programmable for function, scaling (including invert), offset, signal loss detect and square root.
   b. (Two) single-ended, ±10V (bi-polar)/20 mA analog output, 11 bit plus sign. Both inputs fully user programmable to be proportional to one of the following process parameters including output frequency, output current, encoder feedback, output power and others. Programming shall select either absolute or signed values of these parameters.
   c. (One) input for motor protection thermistor (1.8k ohm PTC). Drive will provide fault protection if temperature exceeds protection value.

2. Digital I/O
   a. (Six) digital inputs 24V DC or 115 VAC inputs configurable as sink or source, individually programmable for functions from a list that include Start (3-wire control), Run (2-wire control), Stop, External fault, Speed select, Jog, Process PI functions, Level-sensitive Run and others
   b. One input shall be capable of being set by a jumper to a hardware enable. In this state, no microprocessor control shall be required to disable the drive outputs.
   c. (Three) relay outputs , (1 - form C, 1 - form B, 1- form A) programmable to a minimum of the following fault conditions including Fault, Alarm, At Speed, Drive Ready, PI Excess Error.

3. Reference Signals
   a. The drive shall be capable of the following speed reference signals:
   - Digital MOP
   - Jog
   - HIM (Program/Control panel)
   - Analog Input signals (2)
   - Preset Speeds (7)
   - Communication module commands

   b. Analog input references shall be independently scaleable, both from the analog input side and from the speed reference side. A bi-polar analog signal (-10V to + 10V) may also be used to control direction.

c. In the event of loss of an analog input reference signal, the drive shall be programmable to act in the following way:
   - Fault the drive
   - Alarm and maintain last reference
   - Alarm and go to preset speed
   - Alarm and go to minimum speed
   - Alarm and go to maximum speed
   - Alarm and maintain last output frequency

d. Signal loss detection must be available regardless of the function of the analog input.

The variable frequency drive units shall be Allen Bradley Model Powerflex 700.

B.28.12 Telemetry Control Interface Panel

It will be the responsibility of the station manufacturer to provide the following as an adjunct to the supplied telemetry equipment.

1. 2 of 4” telemetry entrance RMC conduits through the floor to an elevation 12’ above the floor. Locate the stubs directly under the proposed location of the telemetry interface panel.
2. Size 12" x 12" NEMA 1 telemetry interface panel.
3. Separate 120 volt single phase power circuit in conduit to the telemetry interface panel.
4. Telemetry control circuits made up and in conduit from main control panel to telemetry interface panel terminal strip.
5. Metal framing channel to mount telemetry equipment.

B.28.13 Surge Protection Device

A secondary surge arrester shall be provided. Housing shall be ultrasonically sealed. Valve blocks shall be metal oxide with an insulating ceramic collar. Gap design shall be annular. The lead wire shall be permanently crimped to the upper electrode forming part of the gap structure.

Arresters shall be UL and CSA listed Lightning Protective Devices.

B.28.14 Electrical Conduit and Wiring

All service entrance power and signal conduits shall be rigid steel conduit, individually sized to accept the inbound service conductors and telemetry/telephone/radio cables.

Equipment enclosure conduits shall be rigid, heavy wall, Schedule 40 PVC with solvent weld moisture-proof connections, in minimum size 3/4" or larger, sized to handle the type, number and size of equipment conductors to be carried.

The conduit shall be in compliance with Article 347 of the National Electrical Code and NEMA TC-2, Federal WC-1094A and UL-651 Underwriters Laboratory Specifications.

Where flexible conduit connections are necessary, the conduit used shall be Liquid-tight, flexible, totally nonmetallic, corrosion resistant, nonconductive, U.L. listed conduit sized to handle the type, number and size of equipment conductors to be carried - in compliance with Article 351 of the National Electrical Code.

Motor circuit conductors shall be sized for load. All branch circuit conductors supplying a single motor of one (1) horsepower or more shall have an ampacity of not less than 125 percent of the motor full load current rating, dual rated type THHN/THWN, as set forth in Article 310 and 430-B of the National Electrical Code, Schedule 310-13 for flame retardant, heat resistant thermoplastic, copper conductors in a nylon or equivalent outer covering.

Control and accessory wiring shall be sized for load, type MTW/AWM (Machine tool wire/appliance wiring material) as set forth in Article 310 and 670 of the National Electrical Code, Schedule 310-13 and NFPA Standard 79 for flame retardant, moisture, heat and oil resistant thermoplastic, copper conductors in compliance with NTMA and as listed by Underwriters Laboratories (AWM), except where accessories are furnished with a manufacturer supplied UL approved rubber cord and plug.

B.28.15 Station Exterior Lighting

LED exterior lights shall be provided as located on the drawing. Unit shall be a single piece die cast aluminum housing with a die cast door frame with impact resistant tempered glass lens. Door frame to have a closed cell silicone gasket. Exterior surfaces to have a zinc-infused thermoset dark bronze powder coat finish of a minimum 3-mil thichness. The refractive acrylic shall have a Type II distribution. The LED shall provide a minimum of 5846 lumens while consuming 73 or less watts. With an approximate 4000K, 67 CRI color. Unit shall have an integral surge protector.

B.28.16 Station Interior Lighting

Provide ceiling mounted LED interior lights as located on the drawings. Units shall have a UV stabilized injection molded impact resistant frosted polycarbonate housing with continuous poured in place closed cell gasket. Provide a 20-gauge steel channel and channel cover. Provide a UV stabilized injection molded clear transparent polycarbonate lens providing an asymmetrical optical distribution with stainless steel latches. The enclosure shall have an IP65 rating. LEDs shall have a 4100 K color temperature driven by a multivolt (100V-277V) driver which includes a high temperature cut-out and surge protection. Power consumption for LEDs and driver shall be 80 watts or less and providing a minimum of 5700 initial lumens with a 350 Ma drive current. The light switch shall be of the night glow type and be located conveniently adjacent to the door.

B.29 Heating/Cooling/Exhaust Unit

The unit shall be one-piece, wall-mounted, factory-assembled, pre-charged, prewired, tested and ready-to-operate. The unit shall have a limited warranty of 2-years on parts and 1-year on compressor. Capacity and EER certified in accordance to ANSI/ARI Standard 390-2003.

1. One each exterior wall mounted, hard-wired as shown;
2. Enclosed weatherproof casing constructed of 20 gauge galvanized steel, finished with baked-on polyester enamel paint;
3. One washable filter;
4. Remote adjustable thermostat;
5. Refrigerant: 410A (HFC);
6. Minimum EER Rating: 9.00.

Cooling Capacity	BTUH	Breaker size	CFM @ 0.2" ESP, (Max/Min)	Heater	Bard Manufacturing Part Number
3 Ton	35,400	30	1285/885	15 KW	W36A2-C15BW

B.30 Dehumidifiers

1. One each, installed as shown.
2. Capacity 30 pints per 24 hours.
3. Compressor rated 115 volts, 60 Hz, 4.3 operating amps.
4. 106 CFM fan, 2 fan speed.
5. Humidity range 35 to 80% RH, ambient temperature range of 41 to 95 F, Type R410A refrigerant.
6. Washable filter.
7. Condensate piped direct to drain.
8. UL listed rubber cord.

C Construction

C.1 Buliding Mounting and Fastening

The building shall be fabricated up from and securely attached to a framework fabricated of 2" x 6" steel tubing welded at each corner to form a base frame serving as a stable base for handling and transporting the building prior to attaching the building to the station base skid. To hold the building framing to the 2" x 6" base frame, 5/8" anchor studs will be welded to the base frame. In assembling the building framing to the base frame a 3 1/4" x 4" x 1/4" thick anchor plate under a flat washer, lock washer and 5/8" nut shall be used to fasten the building framing to the framing base as shown. The base frame shall be grit blasted to a SP-6 finish and coated with the specified coating material.

The building enclosure shall be firmly and securely attached to the steel base structure by lag bolting from inside the station, through evenly spaced 9/32" holes pre-drilled into a 2" by 1-1/2" by 1/8" thick angle piece that has been continuously welded to the steel floor. The lag bolts shall screw into the 2" x 6" tubular base frame upon which the building has been built.

C.2 Exterior Housewrap

The station manufacturer shall apply a layer of housewrap to the exterior of the building.

The housewrap shall be stapled to the exterior sheathing.

Unless an additional exterior material is placed over the housewrap, nailer strips shall be nailed over the housewrap to keep the material from tearing away during shipment.

C.3 Factory Installed Trussed Roof System
Cover the 9/16" USF decking with a 26 gauge metal panel system to form a standing seam roof as shown.

Cover the ridgeline of the roof end to end with a broken edge panel open along the sides to create a roof vent along both sides of the entire ridge line. The top of the broken edge panel along the ridge line shall cover over the top of the standing seams to provide a finished appearance.

Install metal fascia and soffits on the building after installation of the field applied brick. These materials for the fascia and soffit shall be complimentary in color and texture and approved by the engineer. The station manufacturer shall ship the gutters, fascia and soffit loose with the pump station.

C.4 Bridge Crane System Supports
The supports for the bridge crane running beams shall be attached into the building structure or shall be supported by structural steel, vertical columns placed along the sidewalls in sufficient numbers to fully support the bridge crane structure and any lifted load at any point within the building.

C.5 Skid Insulation
Apply the insulation in each of the spaces between the structural members and the interior perimeter of the skid by spray and other approved methods.

C.6 Floor Drains
Install a 17' long and 10" wide trench drain as shown on the drawing.

Where floor drains must connected to a sanitary sewer system, the floor drain shall be a 10" opening for a 6" drain line and grate in the floor plate into which has been fully welded a four inch long piece of pipe to finish flush with the floor. The installing contractor shall install the sewer line without the catch grate so that the sewer line shall project up above the floor level when the building is set. The installing contractor shall cut off the pipe and slip on the catch grate and grout closed the opening around the catch grate in a workmanlike manner.

C.7 Piping Floor Penetrations
Where suction and discharge piping, or any other pressure piping, passes through the station floor plate and base sub-structure, that area of the floor shall be provided with a grout sleeve made up of steel pipe of 9" height and of sufficient annular diameter to pass a full size pipe flange for the pipe size shown.

Weld the steel sleeve into the floor plate with a 1” projection above the floor in the station. Following installation of the inlet and outlet pipes, the installing contractor shall be responsible for furnishing and installing grout to close the opening around the installed pipe.

C.8 Safety Floor Matting

Cover the walkway areas (that space from the control panel and the entire NEC clearance area) with a rubber drainage runner. Do not glue the runner to the floor.

C.9 Pipes

C.9.1 Pipe Welding

All pipe welds shall be performed by certified welders employed by the pump station manufacturer. As part of the equipment submittal, the pump station manufacturer shall provide copies of the welding certificates of the employees who are to perform the pipe welds.

Shop welders shall be certified in accordance to ASME BPVC Section IX or AWS D1.1. Certification shall be done by an independent testing laboratory giving certification for the weld positions for which the tests were performed.

C.9.2 Pipe Surface Preparation

All piping inside and outside surfaces shall be prepared by grit blasting, or other abrasive blasting, prior to any welds taking place to minimum SP-6 finish.

C.9.3 Pipe Cutting

Piping of 4" diameter and smaller may be cut by saw.

Piping of 6" diameter and larger shall be bevel cut, and Oxyfuel or Plasma-arc cutting techniques shall be used to assure and facilitate bevel pipe cuts.

C.9.4 Pipe Supports

Pipe supports are to be fully welded at both end points to the pipe and steel floor where required.

Where components are to be supported and may require disassembly at some time, the supports for these components shall be welded at the bottom and bolted at the top by use of a bolt yoke welded to the top of the support and bolted into the flange connection picking up at least three bolts.

C.9.5 Riser Pipe Vertical Supports

All of the inlet and outlet vertical riser pipes shall be provided each with, two structural steel, angle pipe support welded to the weldment plates on the vertical riser pipe to down to the floor. These supports shall be opposed by at least 120 degrees around the pipe. The minimum member size for these supports shall be 3” x 4” x 1/4” tubular steel.

C.9.6 Fusion Bonded Epoxy Internal Pipe Coating
The internal surfaces of piping to be fusion bonded coated shall be grit blasted to an SP-10 finish with the finish profile required by the coating material manufacturer.

The internal, wetted surfaces of the steel transmission piping shall have applied to it a Fusion Bonded Epoxy Coating on the interior pipe surface. The coating shall be applied and meet the testing requirements of Table 1 and Table 2 with the exception of Table 2 section 7 per AWWA C-213.

C.9.7 Service Connections on Internal Piping
All plumbed devices within the station eventually requiring service, such as meters, control valves, pumps and like equipment, shall be easily removed from the piping by the presence of appropriately placed and sufficient quantity of adaptors and couplings as shown on the drawings; no less than the quantity of couplings and adaptors shown shall be allowed.

C.9.8 Restraining Points
The main inlet and outlet piping to the station shall each be provided with two restraining points as welded on "eyes" or similar device welded to the underside of the base structure framing as shown to facilitate the attachment of joint restraint tie rods or other device to be used in retarding any pipe movement at the connections.

C.9.9 Compression Couplings
The station piping shall include a variety of compression type, flexible coupling to prevent binding and facilitate removal of associated equipment. These couplings are to be where shown on the plans. In lieu of a compression coupling, a flanged coupling adapter (FCA) may be used.

Grooved fittings may not be used under any circumstance.

All compression couplings or flanged coupling adapters (FCA), and flexible connectors/expansion joints shall include a minimum of two zinc coated steel threaded rods across the joint with appropriate bolted restraining points.

C.9.10 Elastomer Pipe Connector
The inlet side of each booster pump shall include an elastomer connector. The elastomer connector shall pass through the plate steel flanges designed to grip the connector so the connector seals without gaskets when the flange bolts are drawn up.

A control joint limiting pipe connector movement shall be supplied with each pipe connector.

C.10 Tank/Wall Penetration Coating Protection Sleeve
Where a fusion bonded epoxy interior coated pipe passes through the steel tank shell or a steel wall section, prior to fusion bonded coating of that pipe, a pipe sleeve shall be welded over the pipe in the area where the pipe passes through the steel sheet.

The sleeve shall be 1/2 inch thickness and fit closely over the transmission pipe. The sleeve shall be seal welded to the transmission pipe at each end with a full and continuous fillet weld.

Following the welding of the sleeve to the transmission piping, the sleeve welds and the sleeve shall be grit blasted to an SP-6 finish so the pipe is prepared for fusion bonded epoxy coating by the process specified elsewhere in these documents.

C.11 Coatings

C.11.1 Corrosion Protection

All interior and exterior surfaces of the exposed steel structure, transmission piping, and fittings shall be gritblasted equal to commercial blast cleaning (SSPC-SP6). Following fabrication all exposed surfaces of the station, interior and exterior, shall be coated according to the following requirements.

C.11.2 Weldment Prime Coating

All weldments will be pretreated by hand to provide additional corrosion protection using the same product as the base coat. Following the pretreatment full coating application shall take place.

C.11.3 Base Coating

The base coating shall take place immediately after surface preparation. The protective coating shall consist of a two-component, high solids, high build, fast drying epoxy system for protection and finishing of steel and having excellent corrosion resistant properties. The epoxy system shall be self-priming and require no intermediate coatings.

C.11.4 Top Coating

Following the base coating application, a full finish coating application shall take place. The protective coating shall consist of a two-component, high solids, high build, fast drying epoxy system for protection and finishing of steel and having excellent corrosion resistant properties. The epoxy system shall be self-priming and require no intermediate coatings. The base and finish coats shall provide a total dry mil thickness of 8.0 mils.

C.11.5 Post-Assembly Coating

Following assembly and just prior to shipping, there shall take place a thorough cleaning of the floor of the station followed by a rolled on coating of the two part epoxy coating to cover over any scuffing or scaring that might have occurred during assembly.

C.12 Line Pressure Gauges

Combination pressure gauge range and scale graduations shall be in psi and feet of water as follows:

Gauge ranges shall be established by the engineer for each of the suction and discharge gauges for each pump station.

All gauges will be panel mounted off the pipeline and be connected to their respective sensing point. The gauge trim tubing shall be complete with both isolating and vent valves and the tubing shall be so arranged as to easily vent air and facilitate gauge removal. Gauges mounted directly to the pipeline or at the sensing point will not be accepted.

C.13 Static and Sensing Lines
The pilot tubing shall be run in a workmanlike manner with elastomeric/stainless steel mounting straps to securely hold the tubing to be free of stress and vibration. The alignment and organization of the sensing lines shall be continuously rising.

C.14 Sample Tap
A single, right angle outlet, smooth nose, brass sample tap shall be affixed to the manual vent ball valve for the low suction lockout and suction pressure gauge assembly.

C.15 Hose Bibb with Vacuum Breaker
Provide a standard hose bibb with valve and vacuum breaker on the suction piping. The hose bibb connection shall be through a pressure regulator if the header pressure would exceed 60 psi.

C.16 Manual Valve Actuators
Manually operated butterfly valves size 6" and smaller shall be equipped with lever style operators capable of withstanding 450 ft. lbs. of input torque and mounted to the valve trunnion with 4 bolts.

Manually operated butterfly valves size 8" and larger shall be equipped with travelling nut style handwheel operators capable of withstanding 450 ft. lbs. of input torque and mounted to the valve trunnion with 4 bolts.

C.17 Pressure Testing
When the station plumbing is completed, the pressure piping within the station (including valves, pumps, control valves, and fittings), connections as make up the entire system shall be hydrostatically tested at a pressure of 150 psi or a pressure equal to the lowest test pressure rating of the equipment within the tested system, whichever is lesser pressure. The test pressure shall be applied for a minimum of 20 minutes, during which time all joints, connections and seams shall be checked for leaking. Any deficiencies found shall be repaired and the system shall be retested.

The results of this testing shall be transmitted in writing to the engineer prior to shipment of the station and shall note test pressure, time at full pressure and be signed by the Quality Control Manager or test technician.

C.18 Equipment Grounding
Each electrical equipment item in the station shall be properly grounded per Section 250 of the National Electrical Code. Items to be grounded include, but are not limited to, pump motor frames, control panel, transformer, convenience receptacles, dedicated receptacle

for heater, air conditioner, dehumidifier, lights, light switch, exhaust fans and pressure switches.

All ground wires from installed equipment shall be in conduit and shall lead back to the appropriate distribution or lighting panel to a copper ground buss specific for grounding purposes and so labeled. The ground buss shall be complete with a lug large enough to accept the installing electrician's bare copper earth ground wire. The bus shall serve as a bond between the earth ground and the equipment ground wires.

C.18.1 Ground Ring

Provide a 10'x 5/8" copper ground rod at each corner, minimum of 5'-0" from the building slab. Provide an exothermic weld for each ground rod. Provide a connect to both the pump station's influent and effluent piping. Connect also to steel framing of the building near the service entrance and on the opposite side of the building. Connect the grounding electrode conductor to the distribution panel.

C.19 Discrete Suction Pressure Control Panel

A pressure gauge shall be sub-panel mounted adjacent to the low suction pressure switch. The gauge and switch shall be so plumbed with the suction header sensing line that a common blow off valve can relieve pressure in both simultaneously for purposes of checking and calibrating the low suction lock-out.

C.20 Electrical Conduit and Wiring

The building shall be completely prewired and shall only require the connection to the electrical service and communications.

These service entrance conduits shall be installed from the main power or control panel through the building floor and terminate exterior to the equipment enclosure as a thread hub. The service entrance exterior conduit connection points shall be capped or plugged for shipment.

All wiring within the equipment enclosure and outside of the panel enclosures shall be run in conduit except where watertight flexible conduit is properly used to connect pump drivers, fan motors, solenoid valves, limit switches, etc., where flexible connections are best utilized.

D Measurement

The department will measure Adler Water Booster Station as a single complete lump sum unit of work, completed in accordance to the contract and accepted.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.5000	Adler Water Booster Station	LS

Payment is full compensation for furnishing and installing all materials including the factory built water booster station, heavy duty steel doors, lag bolts, trussed roof system, chain hoist and trolley, delivery lifting device, building substructure, skid insulation, safety floor matting, pump station, pumps including vibration isolation pads and support stands, piping, pipe supports, pipe coating, pipe connectors, welding wire, pressure gauges, static and sensing lines, valves, magnetic flow meter, heating/cooling/exhaust unit, dehumidifiers; for providing and installing all electrical including service, panel mounting hardware, metering pedestal, distribution panel, ground ring, power transformer, lighting panelboard, discrete suction pressure control panel, phase monitor, pressure indicating transmitters, adjustable frequency drives, telemetry control interface panel, surge protection device, conduit, wiring, interior and exterior lighting; for making all connections; for providing all connectors, including fuses, fuse holders, spices, tape, sealant, wire nuts and lugs; for providing shop drawings, samples, factory start-up service, training and follow-up, operation and maintenance manuals; for the complete design, fabrication, handling, transportation and installation of the water booster station; for providing and installing exterior house wrap, nailing strips, gutters, fascia, brick, mortar, soffit, insulation, floor drains, drain line hook-up, grout for floor penetrations; for pipe welding, preparation, cutting, supports, connections, restraining points, couplings and sleeves; for providing coatings; for providing and installing gauges, static and sensing lines, mounting straps, sample tap, hose bibb with valve and vacuum breaker, manual valve actuators; for pressure testing, equipment grounding; for preparing the foundation; for furnishing and placing all reinforcement and concrete; for furnishing all excavating, bedding, backfilling and disposing of surplus materials.

381. Removing Old Booster Station, Item SPV.0105.5001.

A Description

This special provision describes completely removing the existing underground City of Milwaukee water booster station located north of Adler Street between Station 1010AD+80 and Station 1011AD+10, 23’ LT to 33’ LT and disposing of all debris and resulting materials in accordance to standard spec 204, and as hereinafter provided. The booster station is a concrete vault with 8-inch thick walls that measures 10 feet in width and 30 feet in length. The concrete vault is approximately 11 feet deep not including the 2-foot sump.

Proper abandonment of connected utilities will be in accordance to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest Edition.

B Materials

Furnish Backfill Granular in accordance to the pertinent requirements of standard spec 209 for use as backfill material.

C Construction

C.1 General

Existing booster station drawings are shown in the plans.

Milwaukee Water Works will salvage the existing SCADA control system. At least five working days prior to the start of Removing Old Booster Station, notify Mr. Dave Goldapp, at (414) 286-6301, to arrange for the removal of salvaged items and materials by Milwaukee Water Works. Anticipate up to three days for city forces to remove and salvage materials. Begin Removing Old Booster Station after Milwaukee Water Works has finished salvaging materials.

C.2 Demolition and Removal

Perform work in accordance to standard spec 204 and as hereinafter provided. The contractor is responsible for the safe methods and sequence of controlled removal operations.

Notify public utility companies serving the booster station in sufficient time, before removal operations, to allow them to disconnect and remove their facilities from the vault. WE Energies will remove the cabinet located immediately west of the booster station.

Shut off municipal water service lines by closing the two 12-inch gate valves located north of the 16-inch water main in Adler Street. Cut and remove the booster station's 12-inch water service lines and the 4-inch soil pipe sump drain from inside the concrete vault to a distance of 5 feet outside the concrete vault and bulkhead all pipes.

Safely disconnect power and remove lighting and electrical appurtenances. Remove all materials inside the booster station not salvaged by Milwaukee Water Works including but not limited to bolts, pipes, valves, pumps, pumping units, nozzles, hoses, drains, gauges, controls, and stairs. Remove the booster station concrete vault and outside materials attached to the booster station including but not limited to brick manholes, manhole frames and covers, foundations, concrete slabs and doors. Dispose of all removed material at an offsite location.

Until standing walls have been razed, safely brace existing walls at all times to ensure complete safety during the removal operations. Excavate as required to remove the booster station structure from the ground. Break and remove entirely from the site all walls, floors and footings.

C.3 Disposal of Material

Remove all material from the premises in a safe manner and in compliance with all applicable laws and ordinances. Do not disturb adjacent property.

All materials generated during removal activities are the property of the contractor. Dispose of removed material as specified for disposing of materials in standard spec 203.3.4.

C.4 Backfill

Backfill exposed openings in accordance to standard spec 204.3.1.2.

C.5 Protecting the Site

Prior to Removing Old Booster Station, prepare the site, including the installation and maintenance of all barriers, barricades, warning signs, fencing, and all other items as required for the proper protection of persons on the site and members of the public.

At the end of each day's work, leave site in a safe and secure condition so that no part of the existing booster station is in danger of toppling or falling and unauthorized admittance is prohibited.

After removing the booster station, leave no hazard unmarked and unprotected. Furnish and erect suitable fencing around the exposed openings resulting from excavation, to protect and safeguard the public from all hazardous conditions created by the operations. Install the fencing in such a manner to ensure that the public is prevented from falling into any openings. Remove the fencing after all open excavations have been backfilled satisfactorily and approved by the engineer.

D Measurement

The department will measure Removing Old Booster Station as a single complete lump sum unit of work, completed in accordance to the contract and accepted.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.5001	Removing Old Booster Station	LS

Payment for Removing Old Booster Station is full compensation for furnishing all excavating; for contacting utility companies; for contacting Milwaukee Water Works to coordinate the removal of salvaged materials; for turning off water valves; for disconnecting and abandoning utilities, drain pipes, and water services; for cutting, removing, abandoning, and bulkheading pipes; for furnishing all removals including the concrete vault and foundations; for design and erection and removal of temporary supports, shoring and bracing; for furnishing, placing, and compacting Backfill Granular; for disposing of all removed materials including loading, transporting, and unloading; for restoring the work site; for furnishing, installing and removing fencing, barriers, barricades, warning signs, and all other items as required for proper protection.

382. Burleigh Water Booster Station, Item SPV.0105.5002.

A Description

This special provision describes furnishing, installing and maintaining a temporary water booster pump system at Burleigh Street and includes the installation of two riser pipes connected to the existing 16-inch water main as detailed in the plans along with the required pumping system needed to maintain the required system pressure. This system will need to be tested and operational before the existing 24-inch water main at Wisconsin Avenue can be taken out of service.

Perform work under this item in accordance to the plans, standard specifications, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), and as hereinafter provided and these special provisions.

B Materials

B.1 Water Main

All materials and work required for water main will conform to the SSSW.

Supply two riser pipes for connection to the existing 16-inch water main and two ½-inch sample ports with pressure gauges ranging from 0 psi to 100 psi as shown on the plans. The lower riser pipe assembles will be capped off and left in place after construction.

Provide 2-foot by 2-foot concrete thrust blocks conforming to section 4.3.13 of the SSSW.

Furnish a temporary potable water booster pump system consisting of a high head pump with electric drive, pressure transducer, 8-inch by 8-inch fittings for suction and 6-inch by 6-inch fittings for discharge, and approximately 40 feet of 6-inch flanged ductile iron pipe and 20 feet of 8-inch flanged ductile iron pipe with fittings and support system pressure tested to 150 psi. The potable water booster pump system must be capable of supplying 1850 GPM at 90 psi with a minimum inlet pressure of 40 psi. Provide an automatic pressure monitoring and control system capable of controlling the pump speed via a variable frequency drive control panel rated at 200 HP.

Reserve the pump upon receiving the contract Notice to Proceed.

Furnish concrete conforming to standard spec 501 for use as a concrete pad.

Power the pumping system using a portable generator with cable.

B.2 Backfill

B.2.1 Clear Stone

Furnish ¾-inch clear stone in accordance to the pertinent requirements of section 8.43.6 of the SSSW.

B.2.2 Backfill Slurry

Use fine aggregate and number 1 coarse aggregate conforming to standard spec 501.2.5.3, and water conforming to standard spec 501.2.4 in the Backfill Slurry mix. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily. Submit a mix design for the engineers review prior to placement. Backfill Slurry is considered as mix class III and the department accepts the mix by certification. Mix acceptance and testing in the field is not required.

C Construction

C.1 Water Main

At least twenty working days prior to beginning work on the Burleigh Water Booster Station, contact Mr. Jim Wojcehowicz, Water Superintendent for the City of Wauwatosa Water Utility, 7725 W. North Ave, Wauwatosa, WI, 53213, at (414) 479-8965. Set up and attend a preconstruction meeting with the City of Wauwatosa and the engineer.

Install two riser pipes connected to the existing 16-inch water main as shown on the plans. The two riser pipes are located one on each side of an existing pressure reducing valve (PRV). The PRV steps down the water pressure from 90 psi to 40 psi. During construction of the new 24-inch water main at Wisconsin Avenue, the 90 psi zone will lose service, and the booster pump will need to maintain this zone pressure.

The existing PRV will need to be adjusted before the temporary booster pump can be made operational. The existing PRV will provide relief during low water usage.

Install all fittings, valves, reducers, flanges, ductile iron pipe, concrete thrust blocks, and sample ports required to complete the project as shown on the plans.

Excavate and install a 12-foot by 5-foot concrete pad having a minimum thickness of 5 inches as shown on the plans. Bolt and secure the pump skid to the concrete pad in accordance to the manufacturer's recommendations or as directed by the engineer.

When the temporary booster pump system is in operation, provide an operator on site for 24 hours per day for the entire duration the 24-inch water main at Wisconsin Avenue is out of service.

All equipment shall be suitably protected from the environment and freezing. Provide a heated air enclosure if the operating temperature in below 32 degrees Fahrenheit.

Flush the system after the ductile iron piping connections are complete. Pressure test the system to 150 psi. Collect and test water samples. Submit reports for two safe water samples taken 24 hours apart to the City of Wauwatosa. The City of Wauwatosa will review the results and provide acceptance no later than 48 hours from receiving the reports. The City of Wauwatosa must confirm the safe water results before the temporary booster pump system can be operated. After the safe water results are confirmed, test the temporary booster pump system for a 24 hour trial run before the system can be put into service.

Provide a portable restroom facility outside the roadway within right-of-way at a location approved by the engineer. Do not obstruct sight distance for the traveling public.

After the engineer determines the temporary water booster station is no longer required, remove and salvage the upper riser pipe assembles and flanged ductile iron piping located above existing grade. Store the upper riser pipe assembles and the flanged ductile iron piping at locations approved by the engineer. Contact Jim Wojcehowicz at (414) 479-8965

to arrange for the pickup of salvaged materials. Install a flange plate flush with existing ground to cap the lower riser pipe assembles. Remove water from the 12-inch riser pipes before capping.

C.2 Backfill
Place ¾-inch clear stone to 1-foot above the water main piping as shown on the plans.

Place Backfill Slurry above the ¾-inch clear stone to 6 inches below surface grade as shown on the plans. Prior to placement of Backfill Slurry, provide for positive drainage of the area to be backfilled. Discharge from the truck in a manner to prevent segregation. Consolidation or compaction effort will not be required. Twelve hours shall elapse before covering the backfill.

C.3 Restoration
Install erosion control devices and restore disturbed areas as directed by the engineer. Erosion control and restoration will be paid for under their standard bid items.

C.4 Traffic Control
Install traffic control devices as directed by the engineer in accordance to the pertinent provisions of standard spec 643.3 and as hereinafter provided. For the delivery of equipment and materials, place traffic control devices conforming to the standard detail drawings for Traffic Control, Single Lane Closure, Non-Freeway/Expressway and Traffic Control, Intersection within Single Lane Closure. Do not impact traffic on Burleigh Street during peak hours.

C.5 Protecting the Site
Prior to beginning water main work, install items required for the proper protection of persons on the site and members of the pubic including but not limited to barricades, warning signs, and safety fencing.

Excavate for the asphaltic surface temporary and base aggregate dense on which temporary precast concrete barrier will be placed as shown on the plans. Delivery and installation of the temporary precast concrete barrier will be paid for under their standard bid items.

After the portable generator has been removed and work on the Burleigh Water Booster Station has been satisfactorily completed and approved by the engineer, remove all items required to protect the site.

D Measurement
The department will measure Burleigh Water Booster Station as a single lump sum unit of work for pump system assembly, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.5002	Burleigh Water Booster Station	LS

Payment for Burleigh Water Booster Station is full compensation for contacting the City of Wauwatosa; for setting up and attending a preconstruction meeting with the City of Wauwatosa; for furnishing all excavating and disposal of removed materials including existing conduits; for installing riser pipes; for capping the lower riser pipe assembles and leaving them in place after the work is complete; for furnishing and installing all fittings, valves, valves boxes, flanges, tees, reducers, risers, bends, ductile iron pipe, concrete thrust blocks, sample ports, pressure gauges, and concrete pads; for bolting and securing the pump skid; for furnishing, running, maintaining and removing a portable generator; for furnishing, maintaining and installing the temporary booster station as shown in the plans; for providing a heated air enclosure; for furnishing all safe water and pressure testing; for collecting water samples and submitting water sample reports to the City of Wauwatosa; for adjusting the existing PRV; for testing the temporary booster pump system for a 24 hour trial run; for providing an operator on site for 24 hours per day for the entire duration the 24-inch water main at Wisconsin Avenue is out of service; for furnishing, maintaining and removing a portable restroom facility; for furnishing and placing ¾-inch clear stone and Backfill Slurry; for removing, salvaging, and storing the upper riser pipe assembles and flanged ductile iron piping located above existing grade; for contacting the City of Wauwatosa to arrange for pickup of the upper riser pipe assembles and the flanged ductile iron piping; for furnishing, installing, maintaining and removing all traffic control devices required to complete this work; for furnishing, installing and removing items required for the proper protection of the site including but not limited to barricades, warning signs, and safety fencing.

383. Control of Water, Item SPV.0105.8098.

A Description

This section addresses the provision for designing, furnishing all labor and material needed to control, handle, dispose and treat groundwater and surface water that may be encountered in all excavations as required for performance of the work as shown in the plans.

This special provision does not cover temporary drainage. Conform to standard specification standard spec 205 for temporary drainage.

B Materials

The contractor is responsible to determine materials required to meet this special provision.

C Construction

C.1 Submittals

C.1.1 General

The discharge permits and water control plan shall be submitted to the engineer at least 30 days prior to start of excavation, unless otherwise noted.

C.1.2 Subsurface Conditions

Manholes Z2822 to Z2431: The contractor shall review pertinent geotechnical reports for groundwater information and soil types.

C.1.3 Submittals

Discharge Permit: Submit discharge and well permit applications to Wisconsin Department of Natural Resources (WDNR) if dewatering wells are to be used. Also submit design and calculations for the sedimentation tank or clarifier system to be utilized to reduce sediment levels to minimum levels required by WDNR prior to discharging.

Water Control Plan: Water control plan shall be coordinated with requirements of special provisions, articles Shaft Excavation and Support, Tunnel Excavation, and Geotechnical Instrumentation. The following items shall be included in the water control plan, as a minimum.

a. Descriptions of proposed groundwater and surface water control facilities including, but not limited to, equipment; methods; installation; standby equipment and power supply, pollution control facilities including silt removal facilities, discharge locations to be utilized; removal of water control systems; provisions for immediate temporary water supply as required by this section.
b. The contractor shall submit shop drawings showing locations, dimensions, and relationships of elements of each water control system.
c. Design calculations demonstrating dewatering zone of influence, and adequacy of proposed water control systems and components. The contractor may be required to demonstrate the systems proposed in the water control plan and to verify that adequate equipment, personnel, and materials are provided to dewater the excavations at all locations and times required. The contractor shall provide manufacturer's literature describing installation, operation, and maintenance procedures for all components of the water control system.
d. Monitoring plans including measurement of: pumping rates at excavated locations and wells, reading of piezometers, and water quality sampling of discharge.
e. Method(s) to measure discharge quantities.
f. If system is modified during installation or operation, revise or amend and resubmit Water Control Plan.

Quality Control: During construction, submit rate of discharge, pumping rate measurements, water level readings taken at piezometers, groundwater quality data, and sediment content test results. Contractor’s readings shall be performed in addition to any readings taken by the engineer. Submit the data and test results within 24 hours of readings.

C.1.4 Acceptance

All Information Submittals should be submitted to the engineer. The engineer can reject the submittals which do not contain adequate detail, as required herein. The contractor shall resubmit the rejected submittals within 7 days upon the receipt of the engineer’s rejection notice.

C.2 General Requirements
The contractor shall continuously control, handle, treat and dispose water at all times during the course of construction, and provide adequate backup systems to accomplish control of water in conformance with this special provision to obtain satisfactory working conditions and to maintain the progress of the work. Water to be controlled includes groundwater, contaminated groundwater; and surface water (precipitation and run-off.

For shaft at manhole Z2683, the contractor shall provide the above Work and shall continuously control, handle, and dispose water at all times until the project 1060-33-81 contractor mobilizes. The department will notify the contractor when the project 1060-33-81 contractor mobilizes.

All required drainage, pumping, treatment, and disposal shall be done without damage to adjacent property or structures and without interference with the operations of other contractors, or the rights of public and private owners, or pedestrian and vehicular traffic.

The contractor shall modify the water control system at their own expense if, after installation and while in operation, it causes or threatens to cause damage to adjacent property or to existing buildings, structures, or utilities.

C.3 Regulatory Requirements
Storm water discharge to storm sewers, watercourses, lakes, and wetlands shall conform to the requirements of local, state, and Federal regulations. Water from excavations shall be kept separate from storm water discharge associated with surface construction.

In the event that contaminated waters are encountered, the contractor is required to notify the department prior to discharging contaminated water. Comply with WDNR regulations regarding disposal of contaminated groundwater. Obtain additional permits, if required. Notify the Milwaukee Metropolitan Sewerage District for any discharge of contaminated water into the sewer system, and provide laboratory test results documenting contaminant concentrations.

C.4. Surface Water Control
Intercept and divert surface drainage away from the work sites by the use of dikes, curbwalls, ditches, sumps, or other means. Design surface drainage systems to prevent erosion either on or off the site. Control surface runoff to prevent entry of surface water into excavations and to prevent erosion either on or off the site. Remove drainage systems when no longer needed.

C.5 Water Control in Excavations
Use water control methods that are appropriate, as determined by the contractor, to permit conditions, ground conditions, construction operations, and requirements of these plans and special provisions. The methods shall involve removal of water accumulating within excavations from precipitation and groundwater infiltration, and may involve removal of water outside excavations by means such as the use of dewatering or pressure relief wells.

Water control measures shall minimize adverse effects of elevated or reduced water pressure on the work, the surrounding ground and adjacent facilities and structures. Design and operate the water control measures to prevent removal of in-situ materials (development of lost ground), or loosening or softening of subgrade soils within excavations.

The water control methods shall be of such capacity that they will lower and maintain the free water and piezometric levels, to an elevation at least 2 feet below excavation bottoms regardless of the water volume. The methods shall have sufficient capacity to accomplish this desired result allowing for normal variations in precipitation and soil and aquifer properties.

Control groundwater and surface water such that the construction of tunnels and shafts excavations, trenches and other structures can be performed without adverse effects of water on the facilities being constructed, including prevention of hydrostatic uplift pressures on the new facilities until construction has been adequately completed. If soil stratification is such that the water level cannot be maintained at the specified levels, contractor shall, at no additional cost to the department, control seepage of groundwater by whatever means are necessary to assure that there is no loss of ground by erosion or piping of fines with seepage through shoring or lagging into excavated areas and no instability of slopes due to seepage. Control water during periods when excavating, installing ground support systems, installing subgrade protection measures, placing concrete (except tremie concrete), placing pipe, and at such other times as is necessary for efficient and safe execution of the work.

Should water enter the excavation in amounts that could adversely affect the performance of the work or that has the potential to cause loss or damage to adjacent property or structures, take immediate steps to control the water inflow.

Provide standby pumps and standby power supply where disruption of water control systems could allow water inflows to threaten the work or the safety of personnel.

C.6 Monitoring of Groundwater Levels

Monitor groundwater levels as necessary to evaluate the sufficiency of the control of water system. A system of construction piezometers is required to monitor free water surface elevations and piezometric elevations to evaluate the effectiveness of the water control system in fulfilling the requirements specified herein. Piezometers shall be of adequate numbers and in suitable arrangements and depths for determining the free water surface elevations and piezometric elevation over the area. A minimum of one piezometer per four dewatering wells or one per excavation location shall be installed with the dewatering system at locations and depths proposed by the contractor.

Drilling method utilized for piezometer installation shall be direct rotary with drilling fluid that does not impact the development of the piezometer and shall conform to ASTM D5783. During the drilling, soil sampling at intervals of 2.5 feet or less using standard penetration tests shall be formed in accordance to ASTM D1586. The contractor shall

install and develop piezometers in accordance to ASTM D5092. Develop each installation a minimum of 24 hours after completion. The contractor's engineer will determine the depth of the sensing zone for each piezometer installed based upon observations of retained soil samples.

The contractor shall make a minimum of one reading at each piezometer, per 24-hour period, 5 days per week during the period of dewatering activities (including dewatering by pumping seepage from sumps within shafts or other excavation areas) and one reading at each piezometer per week until the end of construction during periods of no dewatering.

C.7 Dewatering Wells

Obtain a site-specific dewatering discharge or construction site storm water discharge permit if the WDNR has specific concerns that are not addressed by other permits that might otherwise apply.

Obtain a WDNR permit for operation of any well or well system that has a combined pumping capacity of 70 gallons per minute or more (a high capacity extraction system). For purposes of permitting, a well is defined as any opening made in the ground where the depth of the opening is greater than its largest surface dimension and extends more than 10 feet below ground surface. The permit will require that wells be constructed, operated, and abandoned in accordance to Chapter NR 812, Wis. Adm. Code.

Keep dewatering influence zone to the minimum necessary for execution of the work. Obtain any additional geotechnical information necessary for design of a dewatering well system, including performing pump tests, grain size analyses, groundwater chemical analyses, and subsurface investigations. Design and operate wells so as to prevent removal of fine soils with seepage through backpack material and screens. Provide means by which water discharge from each well can be measured and flow rates adjusted. Construct and operate wells in accordance to WDNR requirements. Monitor the rate of discharge from each well on a daily basis with an accuracy of at least 2 percent of the flow.

The wells shall be designed, installed and operated in a manner that will preclude removal of materials from the foundation by the pumping operation (hereafter referred to as "piping of fines"). After installation, each well shall be individually pump-tested at maximum design flow to verify acceptability with respect to piping of fines (sediment mostly consisting of silt and sand) as measured using a centrifugal tester. Any well or wellpoint segment found to be causing piping of fines at a rate exceeding 2 parts per million (ppm) by volume during the individual pump-test at the maximum design flow shall be replaced in a manner acceptable to the engineer, and at no additional cost to the department. Each well shall be checked for sediment piping using a centrifugal tester immediately after installation and at least once per month during operation. Measure the sediment content of the total dewatering effluent using a centrifugal tester at least every 30 days. If the sediment content of the total effluent is greater than 1 ppm, contractor shall identify and abandon wells that are producing excessive sand and replace them if necessary. All sediment content tests shall be performed in the presence of the engineer.

C.8 Ground Loss from Removal or Disturbance of Groundwater

Immediately support any structure including, but not limited to, buildings, bridges, freeway surfaces, streets, and utilities, or portions of such structure, including footings, foundations, basements, walls or concrete driveways that become unstable or vulnerable to settlement due to removal or disturbance of groundwater. Cease excavation and other construction operations that result or have the potential to result in further settlement until corrective measures are implemented. Support shall include but not be limited to shoring; sheeting; bracing; underpinning; compaction grouting; driving piles; excavating, backfilling, and placing new structural concrete beneath or adjacent to the unstable structure; or other means necessary to rectify the particular problem involved.

The contractor shall bear the costs of all loss or damage arising from removal or disturbance of groundwater including, but not limited to claims for subsidence and loss of structure support that may occur in the prosecution of the work. If the contractor fails to correct the damage resulting from his operations, the engineer may deem the work to be unacceptable work as defined in standard spec 105.3.2.2.

C.9 Treatment and Disposal of Water

Discharge all water removed from the construction site through pipes or hoses. Do not convey water in open ditches or trenches. Discharge water in a manner that will not cause soil erosion at the discharge point. Discharge shall not cause sediment accumulation or flooding in any stream, storm sewer, or on adjacent properties.

Treat all water to remove suspended solids, oils, cement, bentonite, and other contaminants by use of settling basins, on-site treatment plant, or other means selected by the contractor. Design the treatment systems for the maximum discharge rates. Treatment systems shall be capable of expansion if greater capacity becomes necessary during the course of the work. As requested by the engineer, the contractor shall provide copies of all records required by the WDNR.

Obtain permission to use storm sewers or drains for water disposal purposes from the authority having jurisdiction. Protection of storm sewers and drains shall be in conformance with the Wisconsin Construction Site Best Management Practices Handbook, latest revision and the requirements by authority having jurisdiction. Any requirements and costs for such use shall be the responsibility of the contractor. Do not cause flooding by overloading or blocking the flow in the drainage facilities, and leave the facilities unrestricted and as clean as originally found. Document the condition of the drainage facilities prior to and subsequent to their use. The engineer may independently verify the condition of such facilities. Repair or restore any damage to facilities as a result of the contractor's operations as directed by the authority having jurisdiction, at the contractor's expense.

Should requirements of any permit be different than requirements herein, the more stringent requirements shall control.

Ventilate enclosures around wells and water discharge points to prevent the accumulation of combustible gas that may escape from solution in groundwater.

On completing the work, clean out and dispose of all sediments and residues in settling basins, treatment facilities, and the like. Dispose of sediments and residues in accordance to applicable regulations.

C.10 Abandonment of Piezometers and Dewatering Wells
Abandon the design phase piezometers and all piezometers and dewatering wells installed during construction in accordance to standard spec 204.3.3.3 and in accordance to NR 812 Wis. Adm. Code, whichever is more stringent.

D Measurement
The measurement of Control of Water will be on lump sum unit of work, acceptably completed. The contractor is responsible for removing all surface and ground water regardless of the quantity during construction to accomplish the work.

E Payment
The department will pay for Control of Water at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.8098	Control of Water	LS

Payment for Control of Water shall be full compensation for, but not limited to complete dewatering system design, installation, monitoring, discharge, and all necessary incidental work as specified in this special provision.

384. Geotechnical Instrumentation, Item SPV.0105.8099.

A Description
This special provision includes requirements to develop the geotechnical instrumentation plan, furnish, install, maintain and remove when applicable, the geotechnical instrumentation for the tunnel and working shafts of Storm Sewer Pipe between manholes Z2683, Z2791, Z2815, Z2817, Z2820 and Z2822. The purpose of the instrumentation program is to monitor ground movements within and around the tunnel and shafts. The instrumentation program specified herein is not intended to be used to ensure the safety of the work.

A.1 Personnel Qualifications
Technicians: A qualified technician shall be licensed surveyor registered in the State of Wisconsin and have a minimum of 5 years of experience in the installation of geotechnical instrumentation similar to those specified herein.

Instrumentation Engineer: The contractor shall hire a professional civil or geotechnical engineer or engineering geologist, with a minimum of 5 years of experience in the installation of instrumentation specified herein.

B Materials

Protective Cover: Protective covers shall be guard casings or valve boxes depending upon installation location, as specified in this special provision. Each protective cover shall be 2 inches larger than the instrument within, or a minimum of 4 inches in inside diameter. Guard casing shall consist of Schedule 40 steel pipe, or equal. Guard casing shall be of such length that it will have a minimum depth below ground surface of 2 feet, and a height above ground surface of 2 feet to 4 feet, or as instructed by the engineer. Guard casing shall have a bolting or screw-type cover that is free of sharp edges and burrs, and is easy to remove for monitoring. Valve boxes shall be cast iron or steel designed to resist traffic loading typical for roadway installation. Valve boxes shall be of such length to have a minimum depth below ground surface of 1.5 feet when installed flush with the ground surface. The valve box shall have a bolting cover.

Inclinometers (INC): Inclinometer casing shall be grooved plastic 2.75-inch OD casing that is compatible with the inclinometer being provided. The casing shall be complete with necessary rigid self-aligning couplings and end plugs. The inclinometer monitoring system shall include a probe, 100 feet of cable, cable relief, pulley assembly, cable hold, and readout. The inclinometer readout shall measure inclinations at any depth selected by the operator and shall digitally store, process and report the data (by display and downloadable digital files) as lateral movements from a stored baseline reading. The cable connecting the sensor and indicator shall have a stranded steel core to take the stress of pulling so as not to break any connectors or wires. The cable shall be jacketed with a waterproof material and marked externally at 1-foot intervals for accurate depth determination. The cable guide pulley shall mount to the top of the inclinometer casing.

Utility Settlement Markers (UM): Subsurface settlement markers for monitoring utility movement shall consist of a 0.75-inch solid rod or No. 6 steel reinforcing rod set within a 2-inch Schedule 80 PVC pipe casing as depicted on a detail in the plans. The upper end of the rod shall have a rounded head or cap set perpendicular to the rod axis. Equivalent types of subsurface settlement markers may be used subject to the engineer’s approval.

Ground Settlement Markers (GM): Surface settlement markers in paved areas shall be hardened steel markers treated or coated to resist corrosion, with an exposed convex head having a minimum diameter of 1/2 inch and similar to surveyor's PK nails. Surface settlement markers in unpaved areas shall be a 2-inch by 2-inch by 18-inch long hardwood hub driven to grade.

C Construction

C.1 Submittals

C.1.1 General

Prepare and submit the qualifications, instrumentation plan and shop drawings, and at least 21 calendar days prior to start of instrumentation installation. The engineer will accept the submittal as submitted or return the submittal with requested revisions. Do not start any work until the engineer provides acceptance of qualifications and instrumentation plan and

shop drawings. Acceptance of the submittals does not relieve the contractor of responsibility for successful completion of the tunnels.

C.1.3 Submittals for Approval

Qualifications: Submit qualifications of the technicians and the instrumentation engineer.

Instrumentation Plan and Shop Drawings: The instrumentation plan and shop drawings shall be prepared by the instrumentation engineer and shall ear the seal, signature and date of the instrumentation engineer. As a minimum, include the following:

a. Shop drawings detailing locations (coordinates), depths, types, details, and other pertinent information showing the installation details for each type of instrumentation required.
b. Shop drawings that indicates the locations of control points and benchmarks associated with surveys for monitoring geotechnical instrumentation.
c. Description of methods for installing and protecting all instruments.
d. Materials and mix portions for cement-bentonite or cement-lime grout for installing subsurface settlement markers and inclinometers.
e. Schedule of instrument installation and baseline related to significant activities or milestones in the overall project.
f. Manufacturer's literature describing installation, operation, and maintenance procedures for all instruments, materials, readout units, and accessories.
g. Submit permits and consents from authority having jurisdiction, if applicable, for drilling holes from ground surface and conducting monitoring activities.
h. Plans for geotechnical instrumentation to be installed at contractor’s option.
i. Contingency plan when monitoring Threshold Limits are exceeded.

As-built Plans: Following installation of the instruments and prior to the start of underground construction, submit as-built drawings showing the exact installed location (coordinates and elevation), inclinometer’s groove orientation relative to the shaft, the instrument identification number, the instrument type, the installation date and time, the heading station or portal or shaft excavation depth on the installation date, when applicable, and the anchor or tip elevation and instrument length, when applicable, and installed locations of control points and benchmarks associated with surveys for monitoring geotechnical instrumentation. Include details of installed instruments, accessories, and protective measures including all dimensions and materials used.

C.1.3 Information Submittals

Certificates: Submit for each instrument to be installed, as applicable, a certificate issued by the instrument's manufacturer stating that the manufacturer has inspected and tested each instrument before it leaves the factory to confirm that the instrument is working correctly and has no defects or missing parts.

Reports and Records:

a. Drilling and installation logs for instrumentation installations prepared by the instrumentation engineer.
b. Submit copies of completed DNR abandonment forms for subsurface settlement markers and inclinometers as soon as possible after instruments are installed or abandoned.
c. Submit pre-construction assessment report prior to start of any construction or dewatering activities. The pre-construction assessment report shall document the condition of the existing roadway, utilities, and any structures within the zone of influence defined herein.
d. Submit post-construction assessment report at the end of construction.
e. Submit initial/baseline readings specified herein to the engineer, at least 15 days prior to the start of any construction activity within 50 of the tunnel alignment centerline or edge of the shafts or dewatering within 100 feet of the instrument.
f. Weekly monitoring report by the instrumentation engineer shall be submitted on a weekly basis as specified herein. Supply copies of field notes if requested. As a minimum, construction status (dewatering activity, excavation depth, tunnel progress etc.), monitoring data (with comparison to the baseline readings), interpreted results, exceedances and comments, and impact assessment to adjacent roadway/structure based on monitored movement shall be included in the weekly monitoring report.
g. The contractor shall submit monthly reports, prepared by the contractor's excavation support system design engineer, which include his/her field observation on performance of shaft excavation support systems and review of relevant instrumentation monitoring data.

C.1.4 Acceptance

The engineer will evaluate the Submittals for Approval with the requirements of this special provision. Within 14 calendar days after receipt of the Submittals of Approval, The engineer will notify the contractor of the acceptance of the submittal, or if additional information and/or changes are required. Any unacceptable part of the Submittals of Approval will require resubmission. The contractor must resubmit the Submittals of Approval for evaluation and review with the necessary changes or additional information provided. The engineer will provide a written notice of acceptance or rejection of contractor's resubmitted Submittal for Approval within 14 calendar days after its receipt.

After the engineer's acceptance of Submittal of Approval, no changes to the Submittal of Approval can be made without written consent of the engineer.

All Information Submittals should be submitted to the engineer. The engineer can reject the submittals which do not adequate detail, as required herein. The contractor shall resubmit the rejected submittals within 7 days upon the receipt of the engineer's rejection notice.

C.2 General Requirement

The contractor shall develop the instrumentation plan based on the following requirements:

a. Monitoring shall be performed within tunnel and shaft zone of influence. Tunnel zone of influence shall be defined as a theoretical slope of 1.5H:1V from the spring lines of tunnel excavation. Shaft zone of influence shall be defined as a theoretical slope of 1H:1V from the bottom of shaft excavation.
b. INCs shall be installed at the following locations:
    i. within the shaft zone of influence at Z2683.
    ii. within the shaft zone of influence at Z2791.
    iii. within the shaft zone of influence at Z2822.
c. UMs shall be installed for all active utilities larger than 18-inch diameter and deeper than 5 feet below ground surface to the crown which are located within the defined zone of influence.
d. GMs shall be installed at the following locations:
    i. within 5 ft. from edge of the shaft on four sides of the shaft
    ii. at 100-foot spacing along each tunnel centerline
    iii. above the utilities which do not require UM installation
    iv. on the existing Hank Aaron State Trail and Schlinger Avenue above the tunnel centerline
    v. immediately adjacent to any existing structure which located within the tunnel and shaft zone of influence as defined herein, and dewatering zone of influence as specified in the special provisions, article Control of Water.

The contractor shall install instruments as per the approved submittals. The instrumentation engineer shall supervise and direct technicians and be responsible for instrument installation required. The instrumentation engineer shall be physically present at the installation sites to supervise the installations.

The contractor shall abandon all instruments upon completion of the work.

C.3 Installation

Geotechnical instrumentation shall be installed and baseline readings shall be completed:

a. before commencing any control of water activity, for the instruments are located within the dewatering zone of influence.
b. before installation of shaft excavation support systems, for the instruments within 50 feet from the edge of shaft.
c. before excavation work for shafts and tunnels, for the instruments within 50 feet from the tunnel alignment centerline or edge of shaft.

The contractor shall locate conduits and underground utilities in all areas where borings are to be drilled and instruments installed. Instrument locations shall be modified, as approved by the instrumentation engineer, to avoid interference with the existing conduits and utilities. Repair damage to existing utilities resulting from instrument installations at no additional cost to the department.

All instruments shall be clearly marked, permanently labeled, and protected to avoid being obstructed or otherwise damaged by construction operations or the general public. Protective housing and box or vault covers shall be marked.

After installation of each instrument, survey the as-built location to define the vertical and lateral positions of the exposed parts.

Provide a protective cover for all instruments installed in boreholes from the ground surface. Maintain exposed parts of installed instruments as necessary to ensure their availability for use for the duration of the work. Replace, at no cost to the department, instrumentation in place that becomes damaged, inaccessible, or unreadable as a result of the contractor's means and methods of construction or changes in the contractor's means and methods of construction that could have been anticipated by the contractor prior to installation. The locations of replacement instruments shall be jointly determined by the engineer and the contractor. Complete the repair or replacement as soon as practical.

C.4 Tremie Grouting

Perform tremie grouting by pumping grout through a tremie pipe positioned 3 to 5 feet above the bottom of the space to be grouted. Keep the bottom end of the tremie pipe submerged in grout as the grout level is brought up to the ground surface. The density of the grout flowing from the space at the ground surface shall be the same as the density of the grout being placed. Allow the grout to set for a minimum 12-hour period before additional materials are placed on top of the grout. Top off any settling of grout.

C.5 Installing Inclinometer

Drilling method utilized for INC installation shall be hollow-stem augers per ASTM D6151. Drill borings for inclinometers using 6-inch minimum inside diameter casing and water or, where ground conditions permit, using drilling mud in a 6-inch minimum diameter borehole. During the drilling, soil sampling at intervals of 2.5 feet or less using standard penetration tests shall be formed in accordance to ASTM D1586.

Install the inclinometer casing completed with end plug as shown on the plans. Install the inclinometer casing at least 10 feet below bottom of shaft excavation. Carefully orient the casing grooves as instructed by the instrumentation engineer. Grout the inclinometer casing in place. Place grout by tremie method. If steel drill casing has been used to support the borehole, remove the drill casing in increments, and top off the grout level with each increment.

Perform tremie grouting by pumping grout through a tremie pipe positioned 3 to 5 feet above the bottom of the space to be grouted. Keep the bottom end of the tremie pipe submerged in grout as the grout level is brought up to the ground surface. The density of the grout flowing from the space at the ground surface shall be the same as the density of the grout being placed. Allow the grout to set for a minimum 12-hour period before additional materials are placed on top of the grout. Top off any settling of grout.

The grout shall consist of a cement to water ratio ranging from 2.5 to 1 for hard soil and 6.6 to 1 for soft soil by weight. The specific ratio to be used will be determined by the instrumentation engineer. The bentonite to cement ratio will be approximate 0.3 to 1, by weight, adjusted to produce grout with the consistency of heavy cream. Mix cement and water first. Add bentonite as necessary to achieve the specified consistency.

Provide the top of each inclinometer casing with a cap. The cap shall be easy to remove.

Perform a groove tracking test after the installation has been completed to ensure that the inclinometer casing has been properly installed. Lower the inclinometer sensor to the bottom of the casing in all four possible orientations, verifying that on rising to the top of the casing the inclinometer orientation is unchanged.

C.6 Utility Settlement Markers

UMs shall be installed to 3 feet above the crown of the utility. Potholing methods shall be used to carefully advance a minimum 4-inch diameter hole to the upper surface of the utility to be monitored for installation of a utility settlement marker. Temporary casing shall be set if necessary. Great care shall be taken to prevent damage to the utility.

Potholing is defined as use of vacuum excavating or low pressure water jetting and vacuum excavating to advance holes with low risk of utility damage to confirm utility locations or to advance holes for grout pipes or geotechnical instrumentation to depths below utilities of concern.

A 6-inch minimum thickness bentonite seal shall be placed at the bottom of the borehole to prevent annular backfill and surrounding soil from entering the PVC casing The bentonite shall be hydrated with water prior to placement.

A PVC casing shall be inserted to the bottom of the borehole, and the annular space outside the PVC casing shall be backfilled with coarse sand or grout. Sand shall be placed in maximum 1-foot lifts and tamped with a rod. Grout shall be placed by tremie method. Grout for subsurface settlement markers shall consist of cement and water, with the minimum amount of water necessary to allow pumping. Any temporary casing set in conjunction with potholing shall be withdrawn in a manner to prevent collapse of the borehole. After the annular space is filled, the PVC casing shall be flushed with clean water to remove any soil and grout. A steel rod or pipe with centralizers that is cut to the required length shall be set in firm contact with the top of the utility. A protective cover shall be installed. The installation shall conform to the details shown in the plans.

C.7 Ground Settlement Markers

The method of installation shall be the contractor's option; however, the marker shall be rigidly affixed so as not to move relative to the surface to which it is attached.

C.8 Monitoring Instruments

Horizontal and vertical survey accuracy shall be 1/8 inch or less.

The contractor shall take a minimum of two sets of initial readings. After initial readings are approved by the instrumentation engineer, the average from the initial readings shall be used to establish the baseline reading.

For shafts, monitor all instruments within shaft zone of influence as follows:

a. Monitor all instruments daily within 50 feet of the outer edge of shaft or within dewatering zone of influence, whichever zone is larger, beginning when shaft construction, or dewatering activity begins, whichever comes first.
b. Monitor daily or once per shift, whichever is more frequent during active excavation of shaft, tunnel launching, and tunnel break through.
c. Monitor twice per week during all other construction activities until backfill and removal of shaft excavation support systems.
d. Monitor all GMs and INC within zone of influence of shaft Z2683 once per week after completion of project 1060-33-80 tunnel until project 1060-33-81 contractor mobilizes. The department will notify the contractor when project 1060-33-81 contractor mobilizes

For tunnels, monitor all instruments within tunnel zone of influence as follows:

a. Monitor twice daily or twice per shift, whichever is more frequent during active tunnel excavation beginning when tunnel excavation approaches within 50 feet of the station of the instrument location. Continue monitoring at the same frequency until excavation advances 100 feet beyond the station of the instrument location or the tunnel drive is completed, i.e. tunnel shield or tunnel boring machine completely enters the receiving shaft. The monitoring shall be performed at a maximum interval of 4 hours.
b. Upon completion of the tunnel drive, monitoring daily until contact grouting to fill exterior voids is complete.
c. Continue to monitor weekly until backfill and removal of shaft excavation support systems are completed.

The monitoring threshold limits for all instruments are established as follows:

Facilities Monitoring	**Threshold Limit Level 1**	**Threshold Limit Level 2**
Pavement Settlement	1 inch	1.5 inch
Open Area Settlement	1 inch	2 inch
Underground Utilities	0.75 inch	1 inch
Inclinometer	0.50 inch	1 inch
Excavation Support System Deflection	0.75 inch	1.5 inch

Use whatever means and methods are necessary to limit ground movements, settlements, and damage of utilities, structures and other facilities. These means and methods include, but are not limited to excavation support systems, tunneling methods, underpinning of vulnerable facilities, grouting and other forms of ground improvement.

C.9 Actions to Mitigate Excess Ground Movements

If movement of an instrument reaches the Threshold Limit Level 1, the contractor shall proceed with the approval contingency plan. The likely cause of the movement shall be promptly discussed with the engineer and the contractor's excavation support system design engineer when applicable. The contractor shall increase the monitoring frequency where the Threshold Limit Level 1 was exceeded, as directed by the engineer or the contractor's excavation support system design engineer.

If movement of an instrument reaches the Threshold Limit Level 2, the contractor shall immediately report to the engineer and cease excavation or other construction operations that result in further movement until additional operational changes are made to reduce ground loss around excavation. The approved contingency plan shall be implemented immediately. The likely cause of the displacement shall be discussed with the engineer and the contractor's excavation support system design engineer when applicable. The contractor shall increase the monitoring frequency where the Threshold Limit Level 1 was exceeded, as directed by the engineer or the contractor's excavation support system design engineer. The contractor shall not resume the construction until the ground movement is stabilized, as determined by the instrumentation engineer. If the contractor has exhausted all measures in the approved contingency plan and is not able to stabilize the ground movement, the contractor shall submit a correction plan to the engineer. Upon the engineer's acceptance of the correction plan, the contractor shall implement the correction plan immediately.

The cost of actions required for complying with Threshold Limits and to repair any damage to adjacent facilities shall be borne by the contractor with no additional cost to the department.

D Measurement

The department will measure Geotechnical Instrumentation as a single lump sum unit of work, acceptably completed.

E Payment

The department will pay for the measured quantities or revised quantities if agreed to in advance of placement by the department, at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.8099	Geotechnical Instrumentation	LS

Payment for Geotechnical Instrumentation shall be full compensation for furnishing and installing each instrument which includes all materials, labor, tools and equipment necessary for providing submittals, furnishing materials, installation, testing, protection, maintenance, replacement or repair of damaged instruments, initial readings, subsequent monitoring, abandonment, and all other specified items of work for which no separate bid item is provided.

385. Timber Lagging, Item SPV.0110.4600.

A Description

Work under this item consists of furnishing, delivering, and installing all timber lagging for soldier pile and lagging walls. Perform work in accordance to pertinent parts of the standard specifications, the plans, and these special provisions.

B Materials

Use materials that conform to lumber as specified in standard spec 507 except that preservative treatments according to standard spec 507.2.2.6 are not required and untreated lumber may be used. Use Douglas fir or Southern pine construction grade rough-cut lumber with a minimum thickness of 3-inches. Where necessary provide certification that the timber conforms to the grade, species, and other specified requirements.

C Construction

Place timber lagging from the top-down in sufficiently small lifts immediately after excavation to prevent erosion of materials into excavation. Before placing lagging, smooth the soil face to create a contact surface for the lagging. Backfill and compact large voids behind the lagging. Maintain a minimal gap between each vertically adjacent board for drainage between adjacent lagging sections. Never place lagging in tight contact to adjacent lagging.

D Measurement

The department will not measure Timber Lagging. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0110.4600	Timber Lagging	MBM

Payment is full compensation for Timber Lagging; for furnishing, framing, installing, and the timber lagging.

386. Vibration Monitoring, Item SPV. 0135.0001.

A Description

This special provision describes developing a vibration monitoring plan, deploying seismographs for continuous monitoring, documentation, and reporting for the entire project work site. Vibration Monitoring establishes vibration recordings at the closest affected locations beginning the first day of operations for various vibration inducing activities identified in Section C.1 and lasting the entire duration of said activities unless monitored readings are sufficiently below nuisance limits(shown within), and engineer determines that continued monitoring will be at the contractor’s discretion without further payment.

B (Vacant)

C Construction

C.1 Equipment

Monitor the following operations with a seismograph meeting the requirements of Wisconsin Department of Safety and Professional Services SPS307.43:

- Bridge and sign bridge pile driving or bridge demolition
- Sheet pile installation and removal
- MSE wall compaction
- Asphalt compaction
- Pavement breaking
- All compaction activities utilizing large vibratory rollers
- Any other activities that may cause vibration damage to adjacent buildings, structures, or utilities.

C.2 Preconstruction Survey

The engineer will conduct preconstruction surveys of structures that may be potentially affected by vibration prior to any work. The engineer will visually inspect and record all existing defects in the structures before construction. Photographs and/or video may be used to assist in documentation.

The contractor may conduct and document pre-construction surveys of any additional nearby buildings or structures not identified by the engineer at no additional cost. Provide results to engineer prior to construction. Any damage resulting from excessive vibration-causing operations or claims of damage during construction is the responsibility of the contractor to resolve.

C.3 Monitoring Plan

Submit a monitoring plan that includes the following:

- Location of each vibration-inducing activity to be monitored.
- Locations at which the approved seismographs will be placed.
- Anticipated vibration levels at the closest building(s) or other sensitive facility during the various activities.
- Anticipated monitoring duration for each monitoring location.
- Maximum allowable vibration limits.
- Mitigation plan to reduce potentially excessive vibration levels to acceptable limits.

Obtain the engineer's acceptance seven calendar days before any vibration-inducing activity for the project.

C.4 Monitoring and Recording

Ensure that a qualified person operates the vibration monitoring equipment.

Monitor between the construction vibration source and the closest structure or other sensitive facility subject to vibration damage, and as close as practical to the subject structure or facility. Monitor vibration levels in accordance to the figure 1 and SPS 307.43:

Compare the measured peak particle velocity and frequency data to the nuisance limits specified in Figure 1. Record peak particle velocity and frequency in three mutually perpendicular directions. If any vibration levels exceed the nuisance levels shown, immediately halt the vibration-inducing work, and notify the engineer.

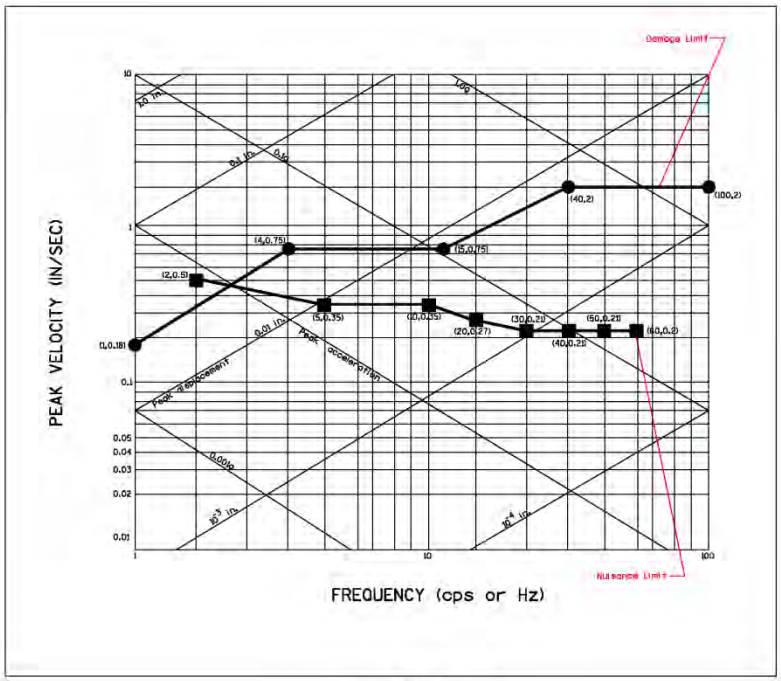


Figure 1
Amplitude of Vertical Vibrations

C.5 Reporting

Furnish a weekly bound report of data recorded at each location to the engineer by 4 PM CST every Friday. Additionally, provide a separate daily report documenting any work that was halted prior to the next vibration-causing workday. Include the following in both reports:

- Date vibration monitoring operations began for each location with an associated compilation of total days currently monitored at each site.
- Identification of vibration inducing activities monitored each day at each location.
- Serial number of vibration monitoring instrument used and record of latest calibration.
- Description of contractor's equipment.

- Name of qualified observer and interpreter.
- Distance and direction of recording station from vibration source.
- Surficial material type at recording station.
- Principal frequency and particle velocity in each component direction.
- Copy of records of seismograph readings, dated and signed by the person qualified to perform vibration monitoring.
- Contractor documentation of any operational changes necessary to reduce vibration levels below nuisance levels.

D Measurement
The department will measure Vibration Monitoring by months, or partial months where applicable, for each seismograph monitoring site, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0135.0001	Vibration Monitoring	Month

Payment of the item Vibration Monitoring is full compensation for setting up and removal of recording unit, an approved vibration monitoring plan, continuous monitoring and recording vibrations, and reporting. No payment for Vibration Monitoring will be paid for without agreement on recommended locations.
SEF 14_0325

387. Traffic Control Fixed Message Signs Left In Place, Item SPV.0165.0500.

A Description
This special provision describes furnishing and installing fixed message signs including posts as shown on the plans.

Traffic Control Fixed Message Signs Left In Place become property of the department after final acceptance by the engineer.

B Materials
This work shall be in accordance to the pertinent provisions of standard spec 643.2 and as hereinafter provided.

C Construction
This work shall be in accordance to the pertinent provisions of standard spec 643.3, as shown on the plans, and as hereinafter provided.

D Measurement
The department will measure Traffic Control Fixed Message Signs Left In Place by the square foot, acceptably completed measured as area of the sign face.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.0500	Traffic Control Fixed Message Signs Left In Place	SF

Payment is full compensation for furnishing and installing the Traffic Control Fixed Message Signs Left In Place.

388. Wall Modular Block Mechanically Stabilized Earth LRFD, Item SPV.0165.0900.

A Description

This special provision describes designing, furnishing materials and erecting a permanent earth retention system in accordance to the lines, dimension, elevations and details as shown on the plans and provided in the contract. The design life of the wall and all wall components shall be 75 years.

B Materials

B.1 Proprietary Mechanically Stabilized Earth Modular Block Wall Systems

The supplied wall system must be from the department's approved list of modular block mechanically stabilized earth wall systems.

Proprietary wall systems may be used for this work, but must conform to the requirements of this specification and be pre-approved for use by the department's Bureau of Structures, Structures Design Section. The department maintains a list of pre-approved systems of retaining walls. To be eligible for use on this project, a system must have been pre-approved and added to that list prior to the bid opening date. The name of the companies supplying pre-approved material shall be furnished within 25 days after the award of contract.

Applications for pre-approval may be submitted at any time. Applications must be prepared in accordance to the requirements of current Chapter 14 of the department's LRFD Bridge Manual. Information and assistance with the pre-approval process can be obtained by contacting the Structures Design Section in Room 601 of the Hill Farms State Transportation Building in Madison or by calling (608) 266-8494.

B.2 Design Requirements

It is the responsibility of the contractor to supply a design and supporting documentation as required by this special provision for review by the department to show the proposed wall design is in compliance with the design specifications.

The design/shop plans shall be prepared on reproducible sheets 11 inch x 17 inch, including borders. Each sheet shall have a title block in the lower right corner. The title block shall include the project identification number and structure number. Design calculations and notes shall be on 8 ½ inch x 11 inch sheets, and shall contain the project

identification number, name or designation of the wall, date of preparation, initials of designer and checker, and page number at the top of the page. All plans and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

The wall shall be designed for the heights shown on the plans. The design shall be in compliance with the *AASHTO LRFD Design Specifications* 5th *Edition* 2010 (AASHTO LRFD) with latest interim specifications for Mechanically Stabilized Earth Walls, WisDOT's current *Standard Specifications for Highway and Structure Construction (*Standard Specifications), Chapter 14 of the WisDOT LRFD Bridge Manual and standard design procedures as determined by the department. Loads, load combinations and load and resistance factors shall be as specified in AASHTO LRFD Section 11. The associated resistance factors shall be defined in accordance to Table 11.5.6-1 in AASHTO LRFD.

The design shall include a minimum overburden surcharge of 100 psf in accordance to Chapter 14 of the WisDOT LRFD Bridge Manual or as shown on the plans. The maximum value of the angle of internal friction of the wall backfill material used for design shall be assumed to be 30 degrees without a certified report of tests. If a certified report of tests yields an angle of internal friction greater than 30 degrees, the larger test value may be used for design, up to a maximum value of 36 degrees.

An external stability check at critical wall stations is performed by the department or its design consultant and the Capacity Demand Ratio (CDR) for sliding, eccentricity, and bearing check is provided by the department or its consultant and shown on the plans.

The design of the Wall Modular Block Mechanically Stabilized Earth shall consider the internal stability of the wall mass (tensile stress, pullout resistance, and tensile stress at the connection with the facing) within each layer of reinforcement for the applicable strength limit and extreme event limit states. Maximum factored loads applied to reinforcements for pullout and the connection to the wall face shall be calculated using the Simplified Method or Coherent Gravity Method, as presented in AASHTO LRFD. In addition, compound stability shall be computed for the applicable strength limit and extreme event limit states in accordance to AASHTO LRFD.

The minimum embedment to the top of the leveling pad shall be as specified in the plans. Potential depth of frost penetration at the wall location shall not be considered in designing the wall for depth of leveling pad.

100% of the soil reinforcement shall be connected to the wall facings. The minimum length of soil reinforcement measured from the back face of the wall shall be equal to 0.7 of the wall height or as shown on the plans. In no case shall this length be less than 6 feet. The soil reinforcement shall extend a minimum of 3 feet beyond the theoretical failure plane in all cases. The maximum vertical spacing of soil reinforcement layers shall be two times the block depth (front face to back face) or 32 inches, whichever is less. The first (bottom) layer of reinforcement shall be placed no further than 12 inches above the top of the leveling pad or the height of the block, but at least one block height above the

leveling pad. The last (top) layer of soil reinforcement shall be no further than 21 inches below the top of the uppermost block.

Submit the following to the engineer for review: complete design calculations, explanatory notes, supporting materials, specifications, and detailed plans and shop drawings for the proposed wall system. The design calculations and notes shall clearly indicate the Capacity to Demand Ratios (CDR) for all internal stabilities as defined in AASHTO LRFD.

The wall submittal package shall be submitted electronically to the engineer and Structures Design Section. Submit all required information no later than 30 days prior to beginning construction of the wall. The detailed plans and shop drawings shall include all details, dimensions, quantities and cross-sections necessary to construct the walls.

B.3 Wall System Components

Materials furnished under this contract shall conform to the requirements of this specification. All certifications related to material and components of the wall systems specified in this subsection shall be submitted to the engineer.

B.3.1 Leveling Pad

The leveling pad shall step to follow the general slope of the ground line. The leveling pad steps shall keep the bottom of the wall below the minimum embedment. Additional embedment that is greater than the minimum embedment will not be measured for payment. The leveling pad shall be as wide as the proposed blocks or a minimum of 12 inches, whichever is greater. The bottom row of blocks shall be horizontal and 100% of the block surface shall bear on the leveling pad.

Provide a 6 inches deep by 12 inch (minimum) wide wall leveling pad that consists of poured concrete masonry, Grade A , A-FA, A-S, A-T, A-IS, or A-IP concrete conforming to standard spec 501 as modified in standard spec 716. Provide QMP for leveling pad concrete as specified in standard spec 716. A concrete leveling pad shall be provided in following scenarios:

- When the wall height measured from the top of the leveling pad to the top of the wall exceeds 5 feet at any point along the entire wall length.
- A structure number has been assigned (such as R-XX-XXX), regardless of wall height.

Additionally, for walls that are less than or equal to 5 feet in height and do not have a wall number assigned to them, a compacted 1 foot deep by 2 foot wide leveling pad made from base aggregate dense 1¼-inch in conformance with standard spec 305 may be used.

B.3.2 Wall Facing

Wall facing units shall consist of precast modular concrete blocks. All units shall incorporate a mechanism or devices that develop a mechanical connection between vertical block layers. Units that are cracked, chipped, or have other imperfections in accordance to ASTM C1372, or have excessive efflorescence shall not be used within the

wall. A single block type and style shall be used throughout each wall. The color and surface texture of the block shall be as given on the plan or chosen by the engineer.

The top course of facing units shall be a solid precast concrete unit designed to be compatible with the remainder of the wall. The finishing course shall be bonded to the underlying facing units with a durable, high strength, flexible adhesive compound compatible with the block material. A formed cast-in-place concrete cap may also be used to finish the wall. A cap of this type shall be designed to have texture, color, and appearance that complement the remainder of the wall. The vertical dimension of the cap shall not be less than 3½ inches. Expansion joints shall be placed in the cap to correspond with each 24 inch change in vertical wall height and at maximum spacing of 10 feet. Concrete for all cast-in-place caps shall be Grade A and shall conform to the requirements of standard spec 501.

Block dimensions may vary no more than ±1/8 inch from the standard values published by the manufacturer in accordance to ASTM C1372. Blocks must have a minimum depth (front face to back face) of 12 inches. The minimum front face thickness of blocks shall be 4 inches measured perpendicular from the front face to inside voids greater than 4 square inches. The minimum allowed thickness of any other portions of the block is 1¾ inches. The front face of the blocks shall conform to plan requirements for color, texture, or patterns.

Cementitious materials and aggregates for modular blocks shall conform to the requirements of ASTM C1372 Section 4.1 and 4.2. Modular blocks shall meet the following requirements.

Test	Method	Requirement
Compressive Strength (psi)	ASTM C140	5000 min.
Water Absorption (%)	ASTM C140	6 max.
Freeze-Thaw Loss (%) 40 cycles, 5 of 5 samples 50 cycles, 4 of 5 samples	ASTM C1262[1]	 1.0 max.[2] 1.5 max.[2]

[1] Test shall be run using a 3% saline solution.

[2] Test results that meet either of the listed requirements for Freeze-Thaw Loss are acceptable.

All blocks shall be certified as to strength, absorption, and freeze-thaw requirements unless, due to contract changes after letting, certified blocks are not available when required. At the time of delivery of certified blocks, furnish the engineer a certified test report from a department-approved independent testing laboratory for each lot of modular blocks. The certified test report shall clearly identify the firm conducting the sampling and testing, the type of block, the date sampled, the name of the person who conducted the sampling, the represented lot, the number of blocks in the lot, and the specific test results for each of the stated requirements of this specification. The tests should have been conducted not more than 18 months prior to delivery. A lot shall not exceed 5000 blocks or fraction thereof produced in day. The certified test results will represent all blocks

within the lot. Each pallet of blocks delivered shall bear lot identification information. Block lots that do not meet the requirements of this specification or blocks without supporting certified test reports will be rejected and shall be removed from the project at no expense to the department.

A department-approved independent testing laboratory shall control and conduct all modular block sampling and testing for certification. Prior to sampling, the manufacturer's representative shall identify all pallets of modular blocks contained in each lot. All pallets of blocks within the lot shall be numbered and marked to facilitate random sample selection.

The representative of the independent testing laboratory shall identify five pallets of blocks by random numbers and shall then select one block from each of these pallets. Solid blocks used as a finishing or top course shall not be selected. The selected blocks shall remain under the control of the person who conducted the sampling until shipped or delivered to the testing laboratory. All pallets of blocks within a lot shall be strapped or wrapped to secure the contents and tagged or marked for identification. The engineer will reject any pallet of blocks delivered to the project without intact security measures. At no expense to the department, the contractor shall remove all rejected blocks from the project.

The department may conduct testing of certified or non-certified modular blocks lots delivered to the project. The department will not conduct freeze-thaw testing on blocks less than 45 days old. If a random sample of five blocks of any lot tested by the department fails to meet any of the requirements of this specification (nonconforming), the contractor shall remove from the project site all blocks from the failed lot not installed in the finished work at no cost to the department, unless the engineer allows otherwise. Nonconforming blocks installed in the finished work will be considered approved by the department as stated in standard spec 106.5(2) and any adjustment to the contract price will not exceed the price of the blocks charged by the supplier.

B.3.3 Geogrids

Geogrid supplied as reinforcing members shall be manufactured from long chain polymers limited to polypropylene, high-density polyethylene, polyaramid, and polyester. Geogrids shall form a uniform rectangular grid of bonded, formed, or fused polymer tensile strands crossing with a nominal right angle orientation. The minimum grid aperture shall be 0.5 inch. The geogrid shall maintain dimension stability during handling, placing, and installation. The geogrid shall be insect, rodent, mildew, and rot resistant. The geogrid shall be furnished in a protective wrapping that shall prevent exposure to ultraviolet radiation and damage from shipping or handling. The geogrid shall be kept dry until installed. Each roll shall be clearly marked to identify the material contained.

The wall supplier shall provide the nominal long-term design strength (T_{al}) and nominal long-term connection strength, T_{alc} as discussed below.

Nominal Long-Term Design Strength (T_{al})

The wall supplier shall supply the nominal long-term design strength (T_{al}) used in the design for each reinforcement layer and shall be determined by dividing the Ultimate Tensile Strength (T_{ult}) by the factors RF_{ID}, RF_{CR}, RF_D.

Hence,

$$T_{al} = \frac{T_{ult}}{RF_{ID} x RF_{CR} x RF_D}$$

where:

T_{ult} = ultimate tensile strength of the reinforcement determined from wide width tensile tests (ASTM D6637) for geogrids based on the minimum average roll value (MARV) for the product

RF_{ID} = strength reduction factor to account for installation damage to the reinforcement. In no case shall RF_{ID} be less than 1.1.

RF_{CR} = strength reduction factor to prevent long-term creep rupture of the reinforcement. In no case shall RF_{CR} be less than 1.2.

RF_D = strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation. In no case shall RF_D be less than 1.1.

Values for RF_{ID}, RF_{CR}, and RF_D shall be determined from product specific test results. Guidelines for determining RF_{ID}, RF_{CR}, and RF_D from product specific data are provided in FHWA Publication No. FHWA-NHI-10-024 and FHWA –NHI-10-025 "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes".

Nominal Long-term Connection Strength T_{ac}

The nominal long term connection strength, $T_{ac,}$ shall be based on laboratory geogrid connection tests between wall facing and geogrids. T_{ac} shall be as given below

$$T_{ac} = \frac{T_{ult} * CR_{cr}}{RF_D}$$

where:

T_{ac} = nominal long-term reinforcement facing connection strength per unit reinfrocment width at a specified confining pressure

T_{ult} = ultimate tensile strength of the reinforcement for geogrids defined as the minimum average roll value (MARV) for the product

CR_{cr} = long term connection strength reduction factor to account for reduced ultimate strength resulting from connection.

RF_D = strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation.

T_{ac} shall be developed from the tests conducted by an independent laboratory on the same facing blocks and geogrids as proposed for the wall and shall cover a range of overburden pressures comparable to those anticipated in the proposed wall. The connection strength reduction factor CR_{cr} shall be determined in accordance to long-term connection test as described in Appendix B of FHWA Publication No. FHWA-NHI 10-025 "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes". CR_{cr} may also be obtained from the short term connection test meeting the requirements of NCMA test method SRWU-1 in Simac et al 1993 or ASTM D4884.

The contractor shall provide a manufacturer's certificate that the Tult (MARV) of the supplied geogrid has been determined in accordance to ASTM D4595 or ASTM D6637 as appropriate. Contractor shall also provide block to block and block to reinforcement connection test reports prepared and certified by an independent laboratory. Also provide calculations in accordance to AASHTO LRFD, and using the results of laboratory tests, that the block-geogrid connections shall be capable of resisting 100% of the maximum tension load in the soil reinforcements at any level within the wall, for the design life of the wall system.

B.3.4 Galvanized Metal Reinforcement

In lieu of polymeric geogrid earth reinforcement, galvanized metal reinforcement may be used. Design and materials shall be in accordance to Section 11.10.6.4.2 of the current *AASHTO LRFD* Specifications. The design life of steel soil reinforcements shall also comply with AASHTO LRFD.

B.3.5 Pins

If pins are used to align modular block facing units, they shall consist of a non-degrading polymer, or hot dipping galvanized steel and be made for the express use with the modular block units supplied, to develop mechanical interlock between facing unit block layers. Connecting pins shall be capable of holding the geogrid in the proper position during backfilling. Furnish documentation that establishes and substantiates the design life of such devices.

B.3.6 Backfill Materials

Wall Backfill, Type A, shall comply with the requirements for Coarse Aggregate No. 1 as given in 501.2.5.4.4 of the Standard Specifications. All backfill placed within a zone from the base of the leveling pad to the top of the final layer of wall facing units and within 1 foot behind the back face of the wall shall be Wall Backfill, Type A. This includes all material used to fill openings in the wall facing units.

Wall Backfill, Type B, shall comply with the requirements for Grade 1 Granular Backfill as contained in standard spec 209.2.2. All backfill placed in a zone extending horizontally from 1 foot behind the back face of the wall to 1 foot beyond the end of the reinforcement and extending vertically from the base of the leveling pad to the top of the final layer of all facing units shall be Wall Backfill, Type B.

Backfill within the reinforced zone shall meet the following requirements:

Test	Method	Value
pH	AASHTO T-289	4.5 – 9.0
Sulfate content[1]	AASHTO T-290	200 ppm max.
Chloride content[1]	AASHTO T-291	100 ppm max.
Electrical Resistivity[1]	AASHTO T-288	3000 ohm/cm min.
Angle of Internal Friction	AASHTO T-236	30 degrees min.
Organic Content[1]	AASHTO T-267	1.0% max.

[1] Requirement does not apply to walls with non-metallic reinforcement.

Prior to placement of the backfill, obtain and furnish to the engineer certified report of test results that the backfill material complies with the requirements of this specification. When backfill characteristics and/or sources change, a certified report of tests must be provided for the new backfill material.

All other backfill materials required to finish the wall and restore the ground surface may be select material available on the project that meets the engineer's approval.

C Construction

C.1 General

Place the wall facing units in accordance to the manufacturer's instructions and to the lines, elevations, batter, and tolerances as shown on the plans. Center the initial layer of facing units on the leveling pad; then level them and properly align them. Fill formed voids or openings in the facing units with wall backfill, Type A. Remove all debris on the top of each layer of facing units, before placing the next layer of facing units.

Install all pins, rods, clips, or other devices used to develop mechanical interlock between facing unit layers in accordance to the manufacturer's directions.

All excavation for the Wall Modular Block Mechanically Stabilized Earth shall conform to standard spec 206. At the end of each working day, provide good temporary drainage such that the backfill shall not become contaminated with run-off soil or water if it should rain. Do not stockpile or store materials or large equipment within 10 feet of the back face of the wall.

C.2 Backfill

Place backfill materials in the areas as indicated on the plans and as detailed in this specification. Backfill lifts shall be no more than 8-inches in depth. Backfilling shall closely follow erection of each course of wall facing units. Compact wall backfill Type A

with at least three passes of lightweight manually operated compaction equipment acceptable to the engineer.

Compact wall backfill Type B as specified in standard spec 207.3.6. Compact Wall Backfill Type B to 95.0% of maximum density as determined by AASHTO T-99, Method C. Perform compaction testing on the backfill. When performing nuclear testing, use a nuclear gauge from the department's approved list, ensure that the operator is a HTCP certified Nuclear Density Technician I, and conform to CMM 8.15 for testing and gauge monitoring methods. Conduct testing at a minimum frequency of 1 test per 2 feet of vertical wall height, per 200 feet length of wall, or major portion thereof. A minimum of one test for every 2-foot layer of vertical wall height is required. Test sites shall be selected using ASTM Method D3665. Deliver documentation of all compaction testing results to the engineer at the time of testing.

Conduct backfilling operations in such a manner as to prevent damage or misalignment of the wall facing units, soil reinforcement, or other wall components. At no expense to the department, correct any such damage or misalignment as directed by the engineer. A field representative of the wall supplier shall be available during wall construction to provide technical assistance to the contractor and the engineer.

Place and compact the MSE backfill to the level of the next higher layer of MSE reinforcement before placing the MSE reinforcement or connecting it to the wall facing. The MSE reinforcement shall lay horizontally on top of the most recently placed and compacted layer of MSE backfill.

Do not operate tracked or wheeled equipment on the backfill within 3 feet from the back face of modular blocks. The engineer may order the removal of any large or heavy equipment that may cause damage or misalignment of the wall facing units.

C.3 Soil Reinforcement

Place soil reinforcement at the positions and to the lengths as indicated on the accepted shop drawings. Take care that backfill placement over the positioned soil reinforcement elements does not cause damage or misalignment of these elements. Correct any such damage or misalignment as directed by the engineer. Do not operate wheeled or tracked equipment directly on the soil reinforcement. A minimum cover of 6 inches is required before such operation is allowed.

C.4 Geogrid Layers

Place and anchor geogrid material between wall unit layers in the same manner as used to determine the Geogrid Block-to-Connection Strength. Place the grid material so that the machine direction of the grid is perpendicular to the wall face. Each grid layer shall be continuous throughout the lengths indicated on the plans. Join grid strips with straps, rings, hooks or other mechanical devices to prevent movement during backfilling operations. Prior to placing backfill on the grid, pull the grid taunt and hold in position with pins, stakes or other methods approved by the engineer.

C.5 Steel Layers
Place the steel reinforcement full width in one piece as shown on the plans. No splicing will be allowed. Maintain elements in position during backfilling.

C.6 Geotechnical Information
Geotechnical data to be used in the design of the wall is given on the wall plan. After completion of wall excavation, notify the department and allow two days for the Regional Soil Engineer to review the foundation.

D Measurement
The department will measure Wall Modular Block Mechanically Stabilized Earth LRFD in area by the square foot, acceptably completed, measured as the vertical area within the pay limits the contract plan show. No other measurement of quantities shall be made in the field unless the engineer directs in writing a change to the limits indicated on the contract plans.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.0900	Wall Modular Block Mechanically Stabilized Earth LRFD	SF

Payment is full compensation for supplying a design and shop drawings; preparing the site, including all necessary excavation and disposal of surplus materials; supplying all necessary wall components to produce a functional system including cap, copings and leveling pad; constructing the retaining system and wall drainage systems if applicable; providing backfill, backfilling and compacting, and for performing compaction testing. Parapets, railings, and other items above the wall cap or coping will be paid for separately.

Any required topsoil, fertilizer, seeding or sodding and mulch will be paid for at the contract unit price of topsoil, fertilizer, seeding or sodding and mulch, respectively.
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389. Longitudinal Grooving Bridge Deck, Item SPV.0165.4700.

A Description
Provide longitudinal deck grooves parallel to the centerline of the roadway prior to opening the bridge to traffic as directed by the engineer.

B Materials
Use a grooving machine containing blades mounted on a multi-blade arbor on a self-propelled machine built for grooving hardened concrete surfaces.

Use a grooving machine with a depth control device that detects variations in the deck surface and adjusts the cutting head height to maintain a specified depth of groove.

Equip the grooving machine with a guide device to control multi-pass alignment.

C Construction

Groove the pavement longitudinally without damaging the concrete deck surface.

Complete a longitudinal grooving operation that results in a uniformly grooved deck surface.

Cut grooves continuously across the deck width to within 18 inches of the barrier rail, curb line, or median divider. If metal floor drains extend more than 18 inches from the barrier rail, curb line, or median divider, all grooves on the bridge deck surface are to end within 6 inches of the floor drain perimeter.

At skewed metal edged expansion joints in the bridge deck surface, end all grooves on the bridge deck surface within 6 inches of the joint leaving no ungrooved surface adjacent to each side of the joint greater than 6 inches in width on the deck side of the expansion joints.

Produce grooves that are continuous across construction joints or other joints in the concrete deck surface less than ½-inch wide.

Construct longitudinal grooves with the following criteria:

Width (In)	Depth (In)	Spacing C-C (In)	Width Tolerance (In)	Depth Tolerance (In)	Spacing Tolerance (In)
1/8	3/16	3/4	0 to 1/16	± 1/16	± 1/16

Collect, remove and dispose of solid material residue and liquid waste resulting from grooving operations by vacuuming in a manner satisfactory to the engineer.

D Measurement

The department will not measure Longitudinal Grooving Bridge Deck. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.4700	Longitudinal Grooving Bridge Deck	SF

Payment is full compensation for providing the required machinery and operators; for grooving, for collecting, removing and properly disposing of all waste materials.

SEF Rev. 13_0812

390. Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP Pilot, Item SPV.0165.4710.

A Description

This special provision describes designing, furnishing materials and erecting a permanent earth retention system in accordance to the lines, dimension, elevations and details as shown on the plans and provided in the contract. The design life of the mechanically stabilized earth (MSE) wall and all wall components shall be 75 years minimum.

This special provision describes the quality management program (QMP) for MSE walls. A quality management program is defined as all activities, including process control, inspection, sampling and testing, and necessary adjustments in the process that are related to the construction of the MSE wall, which meets all the requirements of this provision.

This special provision describes contractor quality control (QC) sampling and testing for backfill density testing, compaction, documenting those results, and documenting related production and placement process changes. This special provision also describes department quality verification (QV), independent assurance (IA), and dispute resolution.

Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes sampling and testing procedures. The contractor may obtain the CMM from the department's web site at:

http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm

B Materials

B.1 Proprietary Mechanically Stabilized Earth Concrete Panel Wall Systems

The supplied wall system must be from the department's approved list of Concrete Panel Mechanically Stabilized Earth Wall systems (Concrete Panel MSE Walls).

Proprietary wall systems may be used for this work, but must conform to the requirements of this specification and be pre-approved for use by the department's Bureau of Structures, Structures Design Section. The department maintains a list of pre-approved Concrete Panel Mechanically Stabilized Earth Wall systems. To be eligible for use on this project, a system must have been pre-approved and added to that list prior to the bid opening date. The name of the pre-approved proprietary wall system selected shall be furnished to the engineer within 25 days after the award of contract. The location of the plant manufacturing the concrete panels shall be furnished to the engineer at least 14 days prior to the start of panel production.

To receive pre-approval, the retaining wall system must comply with all pertinent requirements of this provision. Applications for pre-approval may be submitted at any time. Applications must be prepared in accordance to the requirements of Chapter 14 of the department's LRFD Bridge Manual. Information and assistance with the pre-approval process can be obtained by contacting the Structures Design Section in Room 601 of the Hill Farms State Transportation Building in Madison or by calling (608) 266-8494.

B.2 Design Requirements

It is the responsibility of the contractor to supply a design and supporting documentation as required by this special provision, for review by the department, to show the proposed wall design is in compliance with the design specifications. Four copies of the following shall be submitted to the engineer for review and acceptance no later than 60 days from the date of notification to proceed with the project.

The plans and shop drawings shall be prepared on reproducible sheets 11 inch x 17 inch, including borders. Each sheet shall have a title block in the lower right corner. The title block shall include the project identification number and structure number. Design calculations and notes shall be on 8 ½ inch x 11 inch sheets, and shall contain the project identification number, name or designation of the wall, date of preparation, initials of designer and checker, and page number at the top of the page. All plans, shop drawings, and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

The design of the Concrete Panel MSE wall shall be in compliance with the *AASHTO LRFD Bridge Design Specifications 5th Edition 2010*, (AASHTO LRFD) with latest interim specifications for Mechanically Stabilized Earth Walls, WisDOT's current *Standard Specifications for Highway and Structure Construction* (Standard Specifications), Chapter 14 of the WisDOT LRFD Bridge Manual and standard engineering design procedures as determined by the department. Loads, load combinations, load and resistance factors shall be as specified in AASHTO LRFD Section 11. The associated resistance factors shall be defined in accordance to Table11.5.6-1 LRFD.

Design and construct the walls in accordance to the lines, grades, heights and dimensions shown on the plans, as herein specified, and as directed by the engineer. Where walls or wall sections intersect with an included angle of 130 degrees or less, a vertical corner element separate from the standard panel face shall abut and interact with the opposing standard panels. The corner element shall have ground reinforcement connected specifically to that panel and shall be designed to preclude lateral spread of the intersecting panels. If the wall is installed in front of a bridge abutment or wing, it shall also be designed to resist the applied abutment/bridge lateral forces specified on the contract plans.

Walls parallel to supporting highway traffic shall be designed for the effects of highway surcharge loading equivalent of 2 feet soil surcharge weight or 240 psf. The design shall also consider the traffic barrier impact where applicable. Walls that do not carry highway traffic shall be designed for a live load surcharge of 100 psf in accordance to Chapter 14 of the WisDOT LRFD Bridge Manual or as stated on the plans.

A maximum value of the angle of internal friction of the wall backfill material used for design shall be assumed to be 30 degrees without a certified report of tests. If a certified report of tests yields an angle of internal friction greater than 30 degrees, the larger test value may be used for design, up to a maximum value of 36 degrees.

An external stability check at critical wall stations showing Capacity Demand Ratios (CDR) for sliding, eccentricity, and bearing checks is performed by the department and are provided on the wall plans. If the contractor utilizes an angle of internal friction greater than 30 degrees for the design, external stability checks at critical wall stations showing Capacity Demand Ratios (CDR) for sliding, eccentricity, and bearing checks are required to be analyzed by the contractor.

The design of the Concrete Panel Mechanically Stabilized Earth Wall by the contractor shall consider the internal and compound stability of the wall mass in accordance to AASHTO LRFD 11.10.6. The internal stability shall include soil reinforcement pullout, soil reinforcement rupture, and panel-reinforcement connection failure at each soil reinforcement level. The design shall be performed using the Simplified Method or Coherent Gravity Method. Calculations for factored stresses and resistances shall be based upon assumed conditions at the end of the design life. Compound stability shall be computed for the applicable strength limits.

Facing panels shall meet the design requirements of AASHTO LRFD 11.10.2.3. The Facing panels shall also be designed to resist compaction stresses that occur during the wall erection. The minimum thickness of the Facing panel shall be 5.5 inches. The surface area of a standard single panel cannot exceed 60 square feet. The maximum height of a standard panel shall be 5 feet. The top and bottom panels may exceed 5 foot in height based on site topography subject to the approval by the Structures Design Section. The design of the steel reinforcement within the panels shall be based on one-way bending action. Design the wall panels and joints between panels to accommodate a maximum differential settlement of 1 foot over a 100-foot length, unless the plans indicate other.

The minimum length of soil reinforcement measured from the back face of the wall shall be equal to 0.7 times the wall height or as shown on the plan. In no case shall this length be less than 8 feet. The soil reinforcement length shall be the same from the bottom to the top of the wall. The soil reinforcement shall extend a minimum of 3.0 feet beyond the theoretical failure plane in all cases. The maximum vertical spacing of soil reinforcement layers shall be 31 inches. The uppermost layer of the reinforcement shall be located between 6 inches and 18 inches below the bottom of an overlying slab, footing or top of the wall. The upper layers of the soil reinforcement shall also be checked to verify that they have sufficient tensile resistance against traffic barrier impact where applicable.

All soil reinforcement steel required for the reinforced soil zone shall be connected to the face panels. The reinforcement and the reinforcement/facing connection strength shall be designed to resist maximum factored reinforcement loads in accordance to AASHTO LRFD Section 11.10.6. Facing connection strength shall be defined as the resistance factor times the failure load, or the load at 0.5 inch deformation times 0.9, whichever is less. The nominal long term design strength in steel reinforcement and connections shall be based upon assumed conditions at the end of the design life.

Soil reinforcement shall be prefabricated into single or multiple elements before galvanizing. Soil reinforcement shall be fabricated or designed to avoid piling, drainage structures or other obstacles in the fill without field modifications. Cutting or altering of the basic structural section of either the strip or grid at the site is prohibited unless approved by the Structures Design Section. A minimum clearance of 3" shall be maintained between any obstruction and reinforcement unless otherwise approved by the Structures Design Section. Splicing steel reinforcement is not allowed, unless approved by the Structures Design Section.

MSE facing panels shall be installed on concrete leveling pads. The minimum cross section of the leveling pad shall be 6-inches deep by 1-foot wide. Potential depth of frost penetration at the wall location shall not be considered in designing the wall for depth of leveling pad.

Submit the following to the engineer for review: complete design calculations, explanatory notes, supporting materials, specifications, and detailed plans and shop drawings for the proposed wall system. Sample analyses and hand output shall be submitted to verify the output by the software. The design calculations and notes shall clearly indicate the Capacity to Demand Ratios (CDR) for all internal stabilities as defined in AASHTO LRFD.

The wall submittal package shall be submitted electronically to the engineer and Structures Design Section. Submit all required information no later than 30 days prior to beginning construction of the wall. The detailed plans and shop drawings shall include all details, dimensions, quantities and cross-sections necessary to construct the walls.

B.3 Wall System Components

Materials furnished for wall system components under this contract shall conform to the requirements of this specification. All certifications related to material and components of the wall systems specified in this subsection shall be submitted to the engineer.

B.3.1 General

The walls shall have modular precast concrete face panels produced by a wet cast process, and have cast-in-place concrete pads or footings. The concrete panels shall have a minimum strength of 4000 psi at 28 days. The concrete for the panels shall be air entrained, with an air content of 6% +/- 1.5%. All materials for the concrete mixture for the panels shall meet the requirements of Section 501 of the WisDOT Standard Specifications for Highway and Structure Construction. The panel edges shall be configured so as to conceal the joints. The detail shall be a shiplap, tongue and groove or other detail adequate to prevent vandalism or ultraviolet light damage to the backside of the wall joint covering. Joints between panels shall be no more than 0.75 inch. Use full wall height slip joints at points of differential settlement when detailed on the plan. Horizontal joints must be provided with a compressible bearing material to prevent concrete to concrete contact.

A minimum of two bearing pads shall be used per panel. The allowable bearing stress shall not exceed 900 psi. The bearing pads shall be preformed EPDM rubber conforming to ASTM D-2000, Grade 2, Type A, Class A with a minimum Durometer Hardness of 80, or high- density polyethylene pads with a minimum density of 0.034 lb/in^3 in accordance to ASTM 1505.

An 18-inch wide geotextile shall be used on the backface of the wall panels to cover all panel joints. The geotextile shall meet the physical requirements stated in standard spec 645.2.4 for Geotextile Fabric, Type DF, Schedule B, except that the grab tensile strength shall be a minimum of 180 pounds in both the machine and cross-machine directions. The geotextile shall be attached with a standard construction adhesive suitable for use on concrete surfaces and cold temperatures. The adhesive shall be applied to the panels, not to the geotextile.

When Alternate Wall Backfill Type B (Coarse Aggregate No.1) is used in the reinforced zone as backfill, as required for construction during freezing weather, a geotextile shall be placed to separate the Alternate Wall Backfill Type B from the retained soil. If the wall is constructed in stages where portions of wall backfill consist of Wall Backfill Type A and adjacent portions consist of Alternate Wall Backfill Type B (Coarse Aggregate No.1), a geotextile must also be placed at the interface of and between the two different backfill materials for the entire height of the backfill to prevent migration of finer soil. The geotextile shall also be placed on top of the Alternate Wall Backfill Type B to provide separation from the fill above the wall reinforced zone. Adjoining sections of geotextile should be overlapped by a minimum of 12 in. The geotextile shall meet the physical requirements stated in standard spec 645.2.4 for Geotextile Fabric, Type DF, Schedule B. Where geotextile is used it cannot be placed directly on top of wall reinforcement and it must be placed at one-half of the backfill lift thickness over the reinforcement.

All steel portions of the wall system exposed to earth shall be galvanized. All soil reinforcement and attachment devices shall be carefully inspected to ensure they are true size and free from defects that may impair the strength and durability.

For cast in place sections of cap and coping, use poured concrete masonry Grade A, A-FA, A-S, A-T, A-IS or A-IP concrete conforming to standard specification standard spec 501 as modified in standard specification standard spec 716. Provide QMP for cast in place cap and coping concrete as specified in standard specification standard spec 716, Class II Concrete.

Use a wall leveling pad that consists of poured concrete masonry, Grade A, A-FA, A-S, A-T, A-IS or A-IP concrete conforming to standard specification standard spec 501 as modified in standard specification standard spec 716. Provide QMP for leveling pad concrete as specified in standard specification standard spec 716, Class III Concrete.

The minimum embedment to the top of the leveling pad shall be 1 foot 6 inches or as given on the plan or given in AASHTO LRFD 11.10.2.2 whichever is greater. Step the leveling pad to follow the general slope of the ground line. The leveling pad's steps shall keep the bottom of the wall within one half the panel heights of the minimum embedment i.e. the minimum embedment plus up to one half the height of one panel. Additional embedment may be detailed by the contractor, but will not be measured for payment.

B.3.2 Backfill

Furnish and place backfill for mechanically stabilized earth concrete panel walls as shown on the plans and as hereinafter provided. The entire wall must be constructed using the same backfill material unless otherwise approved by the engineer.

In addition to gradation requirements hereinafter provided, backfill material within the reinforced zone shall meet the following requirements.

Test	Method	Value
pH	AASHTO T-289	5 – 10.0
Sulfate content	AASHTO T-290	200 ppm max.
Chloride content	AASHTO T-291	100 ppm max.
Electrical Resistivity	AASHTO T-288	3000 ohm/cm min.
Organic Content	AASHTO T-267	1.0% max.
Angle of Internal Friction	AASHTO T-236*	30 degrees min. (At 95.0% of maximum density and optimum moisture, per AASHTO T99, or as modified by C.2.)

*If the amount of P-4 material is greater than 60%, use AASHTO 236 with a standard-size shear box. Test results of this method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

If the amount of P-4 material is less than or equal to 60%, two options are available to determine the angle of internal friction. The first method is to perform a fractured faces count, per ASTM 5821, on the R-4 material. If more than 90% of the material is fractured on one face and more than 50% is fractured on two faces, the material meets the specifications and the angle of internal friction can be assumed to be 30 degrees. The second method allows testing all P-1" material, as per AASHTO T-236, with a large shear box. Test results of this second method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

Prior to placement of the backfill, obtain and furnish to the engineer a certified report of test results that the backfill material complies with the requirements of this specification.

Specify the method used to determine the angle of internal friction. This certified report of test shall be less than 6 months old. Tests will be performed by a certified independent laboratory. In addition, when backfill characteristics and/or sources change, provide a certified report of tests for the new backfill material. Additional certified reports of tests (except Angle of Internal Friction test), are also required. These additional backfill tests may be completed at the time of material production or material placement, with concurrence of the engineer. If this additional testing is completed at the time of material production, complete testing for every 2000 cubic yards of backfill or portion thereof. If this additional testing is completed at the time of material placement, complete testing for every 2000 cubic yards of backfill, or portion thereof, used per wall. All certified report of test results shall be less than 6 months old and performed by a certified independent laboratory.

B.3.2.1 Wall Backfill Type A

For typical wall backfill, provide and use backfill that consists of natural sand or a mixture of sand with gravel, crushed gravel or crushed stone. It shall not contain recycled or milled asphalt, recycled concrete, foundry sand, bottom ash, blast furnace slag or other potentially corrosive material.

Provide material conforming to the following gradation requirements as per AASHTO T27.

Sieve Size	Percentage by Weight Passing
1 inch	100
No. 40	0 - 60
No. 200	0 - 15

The material shall have a liquid limit not greater than 25, as per AASHTO T89, and a plasticity index not greater than 6, as per AASHTO T90. Provide the percent by weight, passing the #4 sieve.

B.3.2.2 Wall Backfill Type B

If the project schedule is such that the wall must be constructed during freezing weather, the engineer may allow use of alternate wall backfill materials. The alternate wall backfill materials will only be utilized when approved by the engineer. Alternate Wall Backfill, Type B shall comply with the requirements for Coarse Aggregate No.1 as given in 501.2.5.4.4 of the Standard Specifications. The alternate wall backfill must consist of crushed stone or crushed gravel.

For Alternate Wall Backfill, Type B, provide material conforming to the following gradation requirements as per WisDOT Standard Specifications for Highway and Structure Construction.

Sieve Size	Percentage by Weight Passing
	Size No. 1 Coarse Aggregate, Standard spec 501.2.5.4.4
1”	100
¾”	90-100
3/8”	20-55
#4	0-10
#8	0-5

C Construction

C.1 Excavation and Backfill

Excavation will encompass preparing the leveling pad foundation and the area below the reinforcing strips in accordance to standard spec 206. The volume of excavation covered is limited to the width of the reinforced mass and to the depth of the leveling pad unless shown or noted otherwise on the plan. At the end of each working day, provide good temporary drainage such that the backfill shall not become contaminated with run-off soil or water if it should rain. Do not stockpile or store materials or large equipment within 10 feet of the back of the wall.

C.2 Compaction Compact all backfill behind the wall as specified in standard spec 207.3.6. Compact the backfill to 95.0% of maximum dry density as determined by AASHTO T-99 (modified to compute densities to the nearest 0.1 pcf), or as modified as follows. If the gradation of the granular backfill is such that the P-200 material is less than 7% and the P-40 is less than 30%, a one-point Proctor test can be conducted in place of the 5-point Proctor. To complete this one-point test, compact the sample at a moisture content of 6%, then compute the actual (as-tested) sample moisture after completion of the test. Use Method B or D, and perform this test without removing oversize particles and without correction for coarse particles, as per AASHTO T224. The one-point as-tested moisture content represents the optimum moisture, and the measured one-point density represents the maximum wet density of the material. From these values, the maximum dry density can be computed.

If the engineer allows and approves use of alternate wall backfill material, the compaction of Alternate Wall Backfill Type B (Coarse Aggregate No.1) should be performed with at least three passes of a vibratory compactor in two mutually perpendicular directions (at least 6 passes total), such that with additional compactive effort, no further densification is obtained as visually determined by the engineer. If additional densification is observed after three passes in the two directions, then the material must be re-compacted until no further visual densification is observed. The initial three passes of the compactor must be in the direction parallel to the wall alignment followed by the three passes in the direction perpendicular to the wall alignment. Density testing is not required for Alternate Wall Backfill Type B.

Ensure adequate moisture is present in the backfill during placement and compaction to prevent segregation and to help achieve compaction.

Compaction of backfill within 3 feet of the back face of the wall should be accomplished using lightweight compaction devices. Use of heavy compaction equipment or vehicles should be avoided within 3 feet of the panels.

Place and compact the MSE backfill to the level of the next higher layer of MSE reinforcement before placing the MSE reinforcement or connecting it to the wall facing. The MSE reinforcement shall lay horizontally on the top of the most recently placed and compacted layer of MSE backfill. Bending of MSE reinforcement that result in a kink in the reinforcement shall not be allowed. If skewing of the reinforcement is required due to obstructions in the reinforced fill, the maximum skew angle shall not exceed 15 degrees from the normal position unless a greater angle is shown on the plans. The adequacy of the skewed reinforcement in such a case shall be addressed by supporting calculations.

C.3 Panel Tolerances

As backfill material is placed behind a panel, maintain the panel in its proper inclined position according to the supplier specifications and as approved by the engineer. The supplier shall specify the back batter so that the final position of the wall is vertical. Vertical tolerances and horizontal alignment tolerances shall not exceed ¾-inch when measured along a 10-foot straight edge. The maximum allowable offset in any panel joint shall be ¾-inch. The overall vertical tolerance of the wall (plumbness from top to bottom) shall not exceed ½-inch per 10 feet of wall height. Erect the precast face panels to ensure that they are located within 1 inch from the contract plan offset at any location to ensure proper wall location at the top of the wall. Provide a ¾-inch joint separation between all adjacent face panels to prevent direct concrete-to-concrete contact. Maintain this gap by the use of bearing pads and/or alignment pins. Failure to meet this tolerance shall cause the engineer to require the contractor to disassemble and re-erect the affected portions of the wall. In addition, imperfect molding, honeycombing, cracking or severe chipping of panels shall be cause of panel rejection.

C4 Quality Management Program

C.4.1 Quality Control Plan

Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not perform MSE wall construction work before the engineer reviews and accepts the plan. Construct the project as the plan provides.

Do not change the quality control plan without the engineer's review and acceptance. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in the contractor's laboratory as changes are adopted. Ensure that the plan provides the following elements:

- An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
- The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication process that will be used, and action time frames.

- A list of source locations, section and quarter descriptions, for all aggregate materials requiring QC testing.
- Descriptions of stockpiling and hauling methods.
- An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.
- Location of the QC laboratory, retained sample storage, and other documentation.
- A summary of the locations and calculated quantities to be tested under this provision.

C.4.2 Quality Control Personnel

Perform the quality control sampling, testing, and documentation required under this provision using HTCP certified technicians. Have a HTCP Level I Grading Technician, Level I Aggregate Technician, or Assistant Certified Aggregate Technician (ACT) present at the each grading site during all wall backfill placement, compaction, and nuclear testing activities. Have a HTCP Level I Nuclear Density Technician or Assistant Certified Nuclear Density Technician (ACT) perform field density and field moisture content testing. The HTCP Level I Grading Technician, Level I Aggregate Technician, or Assistant Certified Aggregate Technician (ACT) must also be present to document and confirm the required number of passes of the compaction equipment for the Alternate Wall Backfill Type B during wall backfill placement and compaction activities.

If an Assistant Certified Technician (ACT) is performing sampling or testing, a certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

C.4.3 Equipment

Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the CMM and maintain a calibration record at the laboratory.

Furnish nuclear gauges from the department's approved product list at http://www.atwoodsystems.com/materials. Ensure that the gauge manufacturer or an approved calibration service calibrates the gauge the same calendar year it is used on the project. Retain a copy of the calibration certificate with the gauge.

Conform to ASTM D 6938 and CMM 8.15 for density testing and gauge monitoring methods. Perform nuclear gauge measurements using gamma radiation in the backscatter or direct transmission position. Perform each test for 4 minutes of nuclear gauge count time.

Split each Proctor sample and identify so as to provide comparison with the department's test results. Unless the engineer directs otherwise, retain the QC split samples for 14 calendar days and promptly deliver the department's split samples to the department

C.4.4 Quality Control (QC) Testing

Perform compaction testing on the backfill. Conform to CMM 8.15 for testing and gauge monitoring methods. Conduct density testing at a minimum frequency of 1 test per 150 cubic yards of backfill, or major portion thereof. A minimum of one test for every lift is required. Deliver documentation of all compaction testing results to the engineer at the time of testing. Density testing is not required for Alternate Wall Backfill Type B.

Perform 1 gradation test every 750 cubic yards of fill and one 5-point Proctor test (or as modified in C.2) every 2000 cubic yards of fill. Provide the region split samples of both within 72 hours of sampling, at the region laboratory. Test sites shall be selected using ASTM Method D3665. Provide Proctor test results to the engineer within 48 hours of sampling. Provide gradation test results to the engineer within 24 hours of sampling.

Observe the compaction and densification process for the Alternate Wall Backfill Type B. The material must be compacted using the minimum number of passes of the compaction equipment until no further densification is obtained as visually determined. Provide documentation that the compaction met the required number of passes of the compaction equipment for the Alternate Wall Backfill Type B.

C.4.5 Department Testing

C.4.5.1 General

(1) The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project, and provide test results to the contractor within 2 business days after the department obtains the sample.

C.4.5.2 Quality Verification (QV) Testing

(1) The department will have an HTCP technician, or ACT working under a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in C.4.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.

(2) The department will conduct QV tests at the minimum frequency of 30% of the required contractor density, Proctor and gradation tests.

(3) The department will locate density tests and gradation samples randomly, at locations independent of the contractor's QC work. The department will split each Proctor and gradation QV sample, testing half for QV, and retaining the remaining half for 10 business days.

(4) The department will conduct QV Proctor and gradation tests in a separate laboratory and with separate equipment from the contractor's QC tests. The department will use the same methods specified for QC testing.

(5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to this special provision, the department will take no further action. If density QV test results are nonconforming, the area shall be reworked until the density requirements of this special provision are met. If the gradation test results are nonconforming, standard spec 106.5 will apply. Differing QC and QV nuclear density values of more than 1.5 pcf will be investigated and resolved. QV density tests will be based on the appropriate QC Proctor test results, unless the QV and QC Proctor result difference is greater than 3.0 pcf. Differing QC and QV Proctor values of more than 3.0 pcf will be investigated and resolved.

(6) The department will also provide personnel to be onsite and confirm the required number of passes of the compaction equipment for the Alternate Wall Backfill Type B during wall backfill placement and compaction activities on a random basis. This work does not relieve the contractor of the responsibility to observe and document fill placement and compaction as required in C.4.2 and C.4.4.

C.4.5.3 Independent Assurance (IA)

(1) Independence assurance is unbiased testing the department performs to evaluate the department's QV and the contractor's QC sampling and testing, including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department's independent assurance program. That review may include one or more of the following:

1. Split sample testing.
2. Proficiency sample testing.
3. Witnessing sampling and testing.
4. Test equipment calibration checks.
5. Reviewing required worksheets and control charts.
6. Requesting that testing personnel perform additional sampling and testing.

(2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in C.4.5.4.

C.4.5.4 Dispute Resolution

(1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.

(2) Production test results, and results from other process control testing, may be considered when resolving a dispute.

(3) If the project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product or work, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

C.5 Geotechnical Information

Geotechnical data to be used in the design of the wall is given on the wall plan. After completing wall excavation of the entire reinforced soil zone, notify the department and allow the Regional Geotechnical Engineer two working days to review the foundation.

D Measurement

The department will not measure Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP Pilot. The department will use pay plan quantity according to the Pay Plan Quantity article. No measurement of quantities shall be made in the field. Unless the engineer directs in writing, a change to the limits indicated on the contract plan, wall area constructed above or below these limits will not be measured for payment.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.4710	Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP Pilot	SF

Payment is full compensation for supplying a design and shop drawings; preparing the site, including all necessary excavation and disposal of materials; supplying all necessary wall components to produce a functional system including cap and copings; constructing the retaining system including drainage system; providing backfill (Type A or Type B), backfilling, compacting, developing/completing/documenting the quality management program, performing compaction testing/observation. Parapets, railings, abutment bodies and other items above the wall cap or coping will be paid for separately. Vehicle barrier and its support will be paid separately.

Any required topsoil, fertilizer, seeding or sodding and mulch will be paid for at the contract unit price of topsoil, fertilizer, seeding or sodding and mulch, respectively.

391. Wall Concrete Panel Mechanically Stabilized Earth LRFD/LFCF, Item SPV.0165.4720.

A Description

This special provision describes designing, furnishing materials and erecting a permanent earth retention system in accordance to the lines, dimension, elevations and details as shown on the plans and provided in the contract. The design life of the mechanically stabilized earth (MSE) wall and all wall components shall be 75 years minimum.

This special provision describes using Lightweight Foamed Concrete Fill (LFCF) for the MSE wall backfill in lieu of the engineered granular backfill typically specified for MSE walls. Place LFCF to the limits shown in the plans. Engineered granular backfill is required as designated and shown on the plans in the wall transition zones where the MSE wall backfill transitions from LFCF to conventional engineered granular backfill.

This special provision describes the quality management program (QMP) for MSE walls. A quality management program is defined as all activities, including process control, inspection, sampling and testing, and necessary adjustments in the process that are related to the construction of the MSE wall, which meets all the requirements of this provision.

This special provision describes contractor quality control (QC) sampling and testing for LFCF cast density and compressive strength and granular backfill density testing, documenting those results, and documenting related production and placement process changes. This special provision also describes department quality verification (QV), independent assurance (IA), and dispute resolution.

Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes sampling and testing procedures. The contractor may obtain the CMM from the department's web site at:

http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm

B Materials

B.1 Proprietary Mechanically Stabilized Earth Concrete Panel Wall Systems

The supplied wall system must be from the department's approved list of Concrete Panel Mechanically Stabilized Earth Wall systems (Concrete Panel MSE Walls).

Proprietary wall systems may be used for this work, but must conform to the requirements of this specification and be pre-approved for use by the department's Bureau of Structures, Structures Design Section. The department maintains a list of pre-approved Concrete Panel Mechanically Stabilized Earth Wall systems. To be eligible for use on this project, a system must have been pre-approved and added to that list prior to the bid opening date. The name of the pre-approved proprietary wall system selected shall be furnished to the engineer within 25 days after the award of contract. The location of the plant manufacturing the concrete panels shall be furnished to the engineer at least 14 days prior to the start of panel production.

To receive pre-approval, the retaining wall system must comply with all pertinent requirements of this provision. Applications for pre-approval may be submitted at any time. Applications must be prepared in accordance to the requirements of Chapter 14 of the department's LRFD Bridge Manual. Information and assistance with the pre-approval process can be obtained by contacting the Structures Design Section in Room 601 of the Hill Farms State Transportation Building in Madison or by calling (608) 266-8494.

B.2 Design Requirements

It is the responsibility of the contractor to supply a design and supporting documentation as required by this special provision, for review by the department, to show the proposed wall design is in compliance with the design specifications. Four copies of the following shall be submitted to the engineer for review and acceptance no later than 60 days from the date of notification to proceed with the project.

The plans and shop drawings shall be prepared on reproducible sheets 11 inch x 17 inch, including borders. Each sheet shall have a title block in the lower right corner. The title block shall include the project identification number and structure number. Design calculations and notes shall be on 8 ½ inch x 11 inch sheets, and shall contain the project identification number, name or designation of the wall, date of preparation, initials of designer and checker, and page number at the top of the page. All plans, shop drawings, and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

The design of the Concrete Panel MSE wall shall be in compliance with the *AASHTO LRFD Bridge Design Specifications 5th Edition 2010*, (AASHTO LRFD) with latest interim specifications for Mechanically Stabilized Earth Walls, WisDOT's current *Standard Specifications for Highway and Structure Construction* (Standard Specifications), Chapter 14 of the WisDOT LRFD Bridge Manual and standard engineering design procedures as determined by the department. Loads, load combinations, load and resistance factors shall be as specified in AASHTO LRFD Section 11. The associated resistance factors shall be defined in accordance to Table11.5.6-1 LRFD.

Design and construct the walls in accordance to the lines, grades, heights and dimensions shown on the plans, as herein specified, and as directed by the engineer. Where walls or wall sections intersect with an included angle of 130 degrees or less, a vertical corner element separate from the standard panel face shall abut and interact with the opposing standard panels. The corner element shall have ground reinforcement connected specifically to that panel and shall be designed to preclude lateral spread of the intersecting panels. If the wall is installed in front of a bridge abutment or wing, it shall also be designed to resist the applied abutment/bridge lateral forces specified on the contract plans.

Walls parallel to supporting highway traffic shall be designed for the effects of highway surcharge loading equivalent of 2 feet soil surcharge weight or 240 psf. The design shall also consider the traffic barrier impact where applicable. Walls that do not carry highway

traffic shall be designed for a live load surcharge of 100 psf in accordance to Chapter 14 of the WisDOT LRFD Bridge Manual or as stated on the plans.

Use LFCF as MSE backfill within the limits shown on the plans. The design of the wall and reinforced backfill zone behind this wall is to be based on an equivalent backfill area of assumed granular backfill with a maximum angle of internal friction of 30 degrees and unit weight density equal to the unit weight density of the LFCF backfill. All design and geomtric requirements specified by AASHTO and hereinafter for MSE walls with granular backfill, including minimum length of MSE reinforcement will apply to this wall backfilled with LFCF material in lieu of the granular backfill.

A maximum value of the angle of internal friction used for design for the wall granular backfill placed in the wall transition zones shall be assumed to be 30 degrees.

An external stability check at critical wall stations showing Capacity Demand Ratios (CDR) for sliding, eccentricity, and bearing checks is performed by the department and are provided on the wall plans.

The design of the Concrete Panel Mechanically Stabilized Earth wall by the contractor shall consider the internal and compound stability of the wall mass in accordance to AASHTO LRFD 11.10.6. The internal stability shall include soil reinforcement pullout, soil reinforcement rupture, and panel-reinforcement connection failure at each soil reinforcement level. The design shall be performed using the Simplified Method or Coherent Gravity Method. Calculations for factored stresses and resistances shall be based upon assumed conditions at the end of the design life. Compound stability shall be computed for the applicable strength limits.

Facing panels shall meet the design requirements of AASHTO LRFD 11.10.2.3. The Facing panels shall also be designed to resist fluid pressures due to LFCF placement and compaction stresses that occur during the wall erection. The minimum thickness of the Facing panel shall be 5.5 inches. The surface area of a standard single panel cannot exceed 60 square feet. The maximum height of a standard panel shall be 5 feet. The top and bottom panels may exceed 5 foot in height based on site topography subject to the approval by the Structures Design Section. The design of the steel reinforcement within the panels shall be based on one-way bending action. Design the wall panels and joints between panels to accommodate a maximum differential settlement of 1 foot over a 100-foot length, unless the plans indicate other.

The minimum length of soil reinforcement measured from the back face of the wall shall be equal to 0.7 times the wall height or as shown on the plan; whichever is greater. In no case shall this length be less than 8 feet. The soil reinforcement length shall be the same from the bottom to the top of the wall. The soil reinforcement shall extend a minimum of 3.0 feet beyond the theoretical failure plane in all cases. The maximum vertical spacing of soil reinforcement layers shall be 31 inches. The uppermost layer of the reinforcement shall be located between 6 inches and 18 inches below the bottom of an overlying slab, footing or top of the wall. The upper layers of the soil reinforcement shall also be checked

to verify that they have sufficient tensile resistance against traffic barrier impact where applicable.

All soil reinforcement steel required for the reinforced soil zone shall be connected to the face panels. The reinforcement and the reinforcement/facing connection strength shall be designed to resist maximum factored reinforcement loads in accordance to AASHTO LRFD Section 11.10.6. Facing connection strength shall be defined as the resistance factor times the failure load, or the load at 0.5 inch deformation times 0.9, whichever is less. The nominal long term design strength in steel reinforcement and connections shall be based upon assumed conditions at the end of the design life.

Soil reinforcement shall be prefabricated into single or multiple elements before galvanizing. Soil reinforcement shall be fabricated or designed to avoid piling, drainage structures or other obstacles in the fill without field modifications. Cutting or altering of the basic structural section of either the strip or grid at the site is prohibited unless approved by the Structures Design Section. A minimum clearance of 3" shall be maintained between any obstruction and reinforcement unless otherwise approved by the Structures Design Section. Splicing steel reinforcement is not allowed, unless approved by the Structures Design Section.

MSE facing panels shall be installed on concrete leveling pads. The minimum cross section of the leveling pad shall be 6-inches deep by 1-foot wide. Potential depth of frost penetration at the wall location shall not be considered in designing the wall for depth of leveling pad.

Submit the following to the engineer for review: complete design calculations, explanatory notes, supporting materials, specifications, and detailed plans and shop drawings for the proposed wall system. Sample analyses and hand output shall be submitted to verify the output by the software. The design calculations and notes shall clearly indicate the Capacity to Demand Ratios (CDR) for all internal stabilities as defined in AASHTO LRFD.

The wall submittal package shall be submitted electronically to the engineer and Structures Design Section. Submit all required information no later than 30 days prior to beginning construction of the wall. The detailed plans and shop drawings shall include all details, dimensions, quantities and cross-sections necessary to construct the walls.

B.3 Wall System Components

Materials furnished for wall system components under this contract shall conform to the requirements of this specification. All certifications related to material and components of the wall systems specified in this subsection shall be submitted to the engineer.

B.3.1 General

The walls shall have modular precast concrete face panels produced by a wet cast process, and have cast-in-place concrete pads or footings. The concrete panels shall have a minimum strength of 4000 psi at 28 days. The concrete for the panels shall be air

entrained, with an air content of 6% +/- 1.5%. All materials for the concrete mixture for the panels shall meet the requirements of standard spec 501. The panel edges shall be configured so as to conceal the joints. The detail shall be a shiplap, tongue and groove or other detail adequate to prevent vandalism or ultraviolet light damage to the backside of the wall joint covering. Joints between panels shall be no more than 0.75 inch. Use full wall height slip joints at points of differential settlement when detailed on the plan. Horizontal joints must be provided with a compressible bearing material to prevent concrete to concrete contact.

A minimum of two bearing pads shall be used per panel. The allowable bearing stress shall not exceed 900 psi. The bearing pads shall be preformed EPDM rubber conforming to ASTM D-2000, Grade 2, Type A, Class A with a minimum Durometer Hardness of 80, or high- density polyethylene pads with a minimum density of 0.034 lb/in^3 in accordance to ASTM 1505.

An 18-inch wide geotextile shall be used on the backface of the wall panels to cover all panel joints. The geotextile shall meet the physical requirements stated in standard spec 645.2.4 for Geotextile Fabric, Type DF, Schedule B, except that the grab tensile strength shall be a minimum of 180 pounds in both the machine and cross-machine directions. The geotextile shall be attached with a standard construction adhesive suitable for use on concrete surfaces and cold temperatures. The adhesive shall be applied to the panels, not to the geotextile.

All steel portions of the wall system exposed to earth or LFCF backfill shall be galvanized. All soil reinforcement and attachment devices shall be carefully inspected to ensure they are true size and free from defects that may impair the strength and durability.

For cast in place sections of cap and coping, use poured concrete masonry Grade A, A-FA, A-S, A-T, A-IS or A-IP concrete conforming to standard spec 501 as modified in standard spec 716. Provide QMP for cast in place cap and coping concrete as specified in standard spec 716, Class II Concrete.

Use a wall leveling pad that consists of poured concrete masonry, Grade A, A-FA, A-S, A-T, A-IS or A-IP concrete conforming to standard spec 501 as modified in standard spec 716. Provide QMP for leveling pad concrete as specified in standard spec 716, Class III Concrete.

The minimum embedment to the top of the leveling pad shall be 1 foot 6 inches or as given on the plan or given in AASHTO LRFD 11.10.2.2 whichever is greater. Step the leveling pad to follow the general slope of the ground line. The leveling pad's steps shall keep the bottom of the wall within one half the panel heights of the minimum embedment i.e. the minimum embedment plus up to one half the height of one panel. Additional embedment may be detailed by the contractor, but will not be measured for payment.

B.3.2 Backfill
Furnish and place backfill for mechanically stabilized earth concrete panel walls as shown on the plans and as hereinafter provided.

B.3.2.1 LFCF Backfill
Furnish LFCF backfill for mechanically stabilized earth concrete panel walls LRFD LFCF as shown on the plans and as hereinafter provided. Provide LFCF material meeting the requirements specified in SPV Article Lightweight Foamed Concrete Fill Grade 1 and Lightweight Foamed Concrete Fill Grade 2 included in the contract.

B.3.2.3 Transition Zone Backfill
In the LFCF transition zone indicated on the plans, where the MSE wall backfill transitions from LFCF backfill to conventional MSE granular backfill, provide and use backfill that consists of natural sand or a mixture of sand with gravel, crushed gravel or crushed stone. It shall not contain recycled or milled asphalt, recycled concrete, foundry sand, bottom ash, blast furnace slag or other potentially corrosive material.

Provide material conforming to the following gradation requirements as per AASHTO T27.

Sieve Size	Percentage by Weight Passing
1 inch	100
No. 40	0 – 60
No. 200	0 – 15

The material shall have a liquid limit not greater than 25, as per AASHTO T89, and a plasticity index not greater than 6, as per AASHTO T90. Provide the percent by weight, passing the #4 sieve.

In addition, backfill material shall meet the following requirements.

Test	Method	Value
pH	AASHTO T-289	5 – 10.0
Sulfate content	AASHTO T-290	200 ppm max.
Chloride content	AASHTO T-291	100 ppm max.
Electrical Resistivity	AASHTO T-288	3000 ohm/cm min.
Organic Content	AASHTO T-267	1.0% max.
Angle of Internal Friction	AASHTO T-236*	30 degrees min. (At 95.0% of maximum density and optimum moisture, per AASHTO T99, or as modified by C.2.)

*If the amount of P-4 material is greater than 60%, use AASHTO 236 with a standard-size shear box. Test results of this method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

If the amount of P-4 material is less than or equal to 60%, two options are available to determine the angle of internal friction. The first method is to perform a fractured faces count, per ASTM 5821, on the R-4 material. If more than 90% of the material is fractured on one face and more than 50% is fractured on two faces, the material meets the specifications and the angle of internal friction can be assumed to be 30 degrees. The second method allows testing all P-1" material, as per AASHTO T-236, with a large shear box. Test results of this second method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

Prior to placement of the backfill, obtain and furnish to the engineer a certified report of test results that the backfill material complies with the requirements of this specification. Specify the method used to determine the angle of internal friction. This certified report of test shall be less than 6 months old. Tests will be performed by a certified independent laboratory. In addition, when backfill characteristics and/or sources change, provide a certified report of tests for the new backfill material. Additional certified reports of tests (except Angle of Internal Friction test), are also required. These additional backfill tests may be completed at the time of material production or material placement, with concurrence of the engineer. If this additional testing is completed at the time of material production, complete testing for every 2000 cubic yards of backfill or portion thereof. If this additional testing is completed at the time of material placement, complete testing for every 2000 cubic yards of backfill, or portion thereof, used per wall. All certified report of test results shall be less than 6 months old and performed by a certified independent laboratory.

C Construction

C.1 Excavation and Backfill

Excavation will encompass preparing the leveling pad foundation and the area below the reinforcing strips in accordance to standard spec 206. The volume of excavation covered is limited to the width of the reinforced mass and to the depth of the leveling pad unless shown or noted otherwise on the plan. At the end of each working day, provide good temporary drainage such that the backfill shall not become contaminated with run-off soil or water if it should rain. Do not stockpile or store materials or large equipment within 10 feet of the back of the wall.

C.2 Backfill

C.2.1 LFCF Backfill

Submit an LFCF placement plan, trial batch test results, and quality assurance samples per C.1 of the SPV Article Lightweight Foamed Concrete Fill Grade 1 and Lightweight Foamed Concrete Fill Grade 2 included in the contract. Place LFCF backfill in accordance to the requirement specified in SPV Article Lightweight Foamed Concrete Fill Grade 1 and Lightweight Foamed Concrete Fill Grade 2 included in the contract.

C.2.2 Transition Zone Granular Backfill Compaction

Place and compact all granular backfill placed in the LFCF transition zone indicated on the plans behind the wall as specified in standard spec 207.3.6. Compact the backfill to 95.0% of maximum dry density as determined by AASHTO T-99 (modified to compute densities to the nearest 0.1 pcf), or as modified as follows. If the gradation of the granular backfill is such that the P-200 material is less than 7% and the P-40 is less than 30%, a one-point Proctor test can be conducted in place of the 5-point Proctor. To complete this one-point test, compact the sample at a moisture content of 6%, then compute the actual (as-tested) sample moisture after completion of the test. Use Method B or D, and perform this test without removing oversize particles and without correction for coarse particles, as per AASHTO T224. The one-point as-tested moisture content represents the optimum moisture, and the measured one-point density represents the maximum wet density of the material. From these values, the maximum dry density can be computed.

Ensure adequate moisture is present in the backfill during placement and compaction to prevent segregation and to help achieve compaction.

Compaction of backfill within 3 feet of the back face of the wall should be accomplished using lightweight compaction devices. Use of heavy compaction equipment or vehicles should be avoided within 3 feet of the panels.

C.2.3 MSE Reinforcement

Bending of MSE reinforcement that result in a kink in the reinforcement shall not be allowed. If skewing of the reinforcement is required due to obstructions in the reinforced fill, the maximum skew angle shall not exceed 15 degrees from the normal position unless a greater angle is shown on the plans. The adequacy of the skewed reinforcement in such a case shall be addressed by supporting calculations.

For embedment in LFCF backfill, place MSE reinforcement that will become embedded in the next lift of LFCF prior to placing the LFCF lift. Provide temporary supports to hold the MSE reinforcement a minimum of 4” above the previously placed LFCF backfill so that the MSE reinforcement becomes fully encapsulated in the subsequent LFCF lift placement. Provide adequate supports to hold the MSE reinforcement in an approximate horizontal position with no kinks, sharp bends or abrupt changes in direction in the reinforcement. Do not lay the MSE reinforcement directly on the top of the prior LFCF placement or otherwise locate the MSE reinforcement along cold joints between LFCF placements.

For embedment of MSE reinforcements in granular backfill, place and compact the MSE backfill to the level of the next higher layer of MSE reinforcement before placing the MSE reinforcement or connecting it to the wall facing. The MSE reinforcement shall lay horizontally on the top of the most recently placed and compacted layer of MSE backfill.

C.3 Panel Tolerances

As backfill material is placed behind a panel, maintain the panel in its proper inclined position according to the supplier specifications and as approved by the engineer. The supplier shall specify the back batter so that the final position of the wall is vertical. Vertical tolerances and horizontal alignment tolerances shall not exceed ¾-inch when measured along a 10-foot straight edge. The maximum allowable offset in any panel joint shall be ¾-inch. The overall vertical tolerance of the wall (plumbness from top to bottom) shall not exceed ½-inch per 10 feet of wall height. Erect the precast face panels to ensure that they are located within 1 inch from the contract plan offset at any location to ensure proper wall location at the top of the wall. Provide a ¾-inch joint separation between all adjacent face panels to prevent direct concrete-to-concrete contact. Maintain this gap by the use of bearing pads and/or alignment pins. Failure to meet this tolerance shall cause the engineer to require the contractor to disassemble and re-erect the affected portions of the wall. In addition, imperfect molding, honeycombing, cracking or severe chipping of panels shall be cause of panel rejection.

C4 Quality Management Program

C.4.1 Quality Control Plan

Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not perform MSE wall construction work before the engineer reviews and accepts the plan. Construct the project as the plan provides.

Do not change the quality control plan without the engineer's review and acceptance. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in the contractor's laboratory as changes are adopted. Ensure that the plan provides the following elements:

1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication process that will be used, and action time frames.
3. A list of source locations, section and quarter descriptions, for all aggregate materials requiring QC testing.
4. Descriptions of stockpiling and hauling methods.
5. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.
6. Location of the QC laboratory, retained sample storage, and other documentation.
7. A summary of the locations and calculated quantities to be tested under this provision.

C.4.2 Quality Control Personnel

Perform the quality control sampling, testing, and documentation required under this provision using HTCP certified technicians. Have a HTCP Level I Grading Technician, Level I Aggregate Technician, or Assistant Certified Aggregate Technician (ACT) present at the each grading site during all wall backfill placement, compaction, and nuclear testing

activities. Have a HTCP Level I Nuclear Density Technician or Assistant Certified Nuclear Density Technician (ACT) perform field density and field moisture content testing.

If an Assistant Certified Technician (ACT) is performing sampling or testing, a certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

C.4.3 Equipment

Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the CMM and maintain a calibration record at the laboratory.

Furnish nuclear gauges from the department's approved product list at http://www.atwoodsystems.com/materials. Ensure that the gauge manufacturer or an approved calibration service calibrates the gauge the same calendar year it is used on the project. Retain a copy of the calibration certificate with the gauge.

Conform to ASTM D 6938 and CMM 8.15 for density testing and gauge monitoring methods. Perform nuclear gauge measurements using gamma radiation in the backscatter or direct transmission position. Perform each test for 4 minutes of nuclear gauge count time.

Split each Proctor sample and identify so as to provide comparison with the department's test results. Unless the engineer directs otherwise, retain the QC split samples for 14 calendar days and promptly deliver the department's split samples to the department

C.4.4 Quality Control (QC) Testing

C4.4.1 LFCF Backfill

C4.4.1.1 Cast Density of Field Installed LFCF

Test cast density in accordance to ASTM C 796

1. Prior to placement of the initial batch, the installer shall check the density and adjust the mix as required to obtain the manufacturer's specified cast density at point of placement.
2. At hourly intervals during placement, monitor the density and adjust as necessary to maintain the specified cast density.

C.4.4.1.2 Strength Testing

Conduct strength testing in accordance to ASTM C 796 except do not oven dry the test specimens.

1. Furnish a sufficient quantity of molded and cured cylinders measuring 3-inches in diameter by 6-inches high for required strength tests. Provide molds, and a similar curing environment of the LFCF being tested. Prepare cylinders in accordance to ASTM C1064.
2. Provide certified strength test results to the engineer for acceptance. At a minimum, conduct a set of three (3) strength tests at 1, 2, and 28 day intervals for each 500 cubic yards of LFCF placed and a minimum of two sets of four cylinders each per day
3. Perform the compressive strength testing at a department qualified laboratory meeting the requirements of C.5 in SPV Article Lightweight Foamed Concrete Fill Grade 1 and Lightweight Foamed Concrete Fill Grade 2 included in the contract.

C4.4.2 Granular Backfill

Perform compaction testing on the granular backfill. Conform to CMM 8.15 for testing and gauge monitoring methods. Conduct testing at a minimum frequency of 1 test per 150 cubic yards of backfill, or major portion thereof. A minimum of one test for every lift is required. Deliver documentation of all compaction testing results to the engineer at the time of testing.

Perform 1 gradation test every 750 cubic yards of fill and one 5-point Proctor test (or as modified in C.2) every 2000 cubic yards of fill. Provide the region split samples of both within 72 hours of sampling, at the region laboratory. Test sites shall be selected using ASTM Method D3665. Provide Proctor test results to the engineer within 48 hours of sampling. Provide gradation test results to the engineer within 24 hours of sampling.

C.4.5 Department Testing

C.4.5.1 General

(1) The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project, and provide test results to the contractor within 2 business days after the department obtains the sample.

C.4.5.2 Quality Verification (QV) Testing

(1) The department will have an HTCP technician, or ACT working under a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in C.4.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.

(2) The department will conduct QV tests at the minimum frequency of 30% of the required contractor cast density, compressive strength, density, Proctor and gradation tests.

(3) The department will obtain LFCF material for cast density and compressive strength tests at random intervals independent of the contractor's QC work. For granular backfill the department will locate density tests and gradation samples randomly, at locations independent of the contractor's QC work. The department will split each Proctor and gradation QV sample, testing half for QV, and retaining the remaining half for 10 business days.

(4) The department will conduct cast density, compressive strength, QV Proctor and gradation tests in a separate laboratory and with separate equipment from the contractor's QC tests. The department will use the same methods specified for QC testing.

(5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to this special provision, the department will take no further action. If density QV test results are nonconforming, the area shall be reworked until the density requirements of this special provision are met. If the cast density, compressive strength or gradation test results are nonconforming, standard spec 106.5 will apply. Differing QC and QV nuclear density values of more than 1.5 pcf will be investigated and resolved. QV density tests will be based on the appropriate QC Proctor test results, unless the QV and QC Proctor result difference is greater than 3.0 pcf. Differing QC and QV Proctor values of more than 3.0 pcf will be investigated and resolved. Differing QC and QV cast density and compressive strength test values of more than 4% will be investigated and resolved.

C.4.5.3 Independent Assurance (IA)

(1) Independence assurance is unbiased testing the department performs to evaluate the department's QV and the contractor's QC sampling and testing, including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department's independent assurance program. That review may include one or more of the following:

1. Split sample testing.
2. Proficiency sample testing.
3. Witnessing sampling and testing.
4. Test equipment calibration checks.
5. Reviewing required worksheets and control charts.
6. Requesting that testing personnel perform additional sampling and testing.

(2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in C.4.5.4.

C.4.5.4 Dispute Resolution

(1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.

(2) Production test results, and results from other process control testing, may be considered when resolving a dispute.

(3) If the project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product or work, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

C.5 Dampproofing

Apply dampproofing conforming to standard spec 516 to the final horizontal and vertical surfaces of the LFCF material at locations designated on the plans.

C.6 Geotechnical Information

Geotechnical data to be used in the design of the wall is given on the wall plan. After completing wall excavation of the entire reinforced soil zone, notify the department and allow the Regional Geotechnical Engineer two working days to review the foundation.

D Measurement

The department will not measure Wall Concrete Panel Mechanically Stabilized Earth LRFD/LFCF. The department will use pay plan quantity according to the Pay Plan Quantity article. No measurement of quantities shall be made in the field. Unless the engineer directs in writing, a change to the limits indicated on the contract plan, wall area constructed above or below these limits will not be measured for payment.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.4720	Wall Concrete Panel Mechanically Stabilized Earth LRFD/LFCF	SF

Payment is full compensation for supplying a design and shop drawings; preparing the site, including all necessary excavation and disposal of materials; supplying all necessary wall components to produce a functional system including cap and copings; constructing the retaining system including drainage system; providing and placing LFCF and granular backfill, compacting, developing/completing/documenting the quality management program, performing cast density, compressive strength and compaction testing. Parapets, railings, abutment bodies and other items above the wall cap or coping will be paid for separately. Vehicle barrier and its support will be paid separately.

Any required topsoil, fertilizer, seeding or sodding and mulch will be paid for at the contract unit price of topsoil, fertilizer, seeding or sodding and mulch, respectively.

Dampproofing will be measured and paid for separately in accordance to standard spec 516.

392. Temporary Wall Wire Faced Mechanically Stabilized Earth LRFD/QMP Pilot, Item SPV.0165.4740.

A Description

This special provision describes designing, furnishing materials and erecting a temporary earth retention system in accordance to the lines, dimension, elevations and details as shown on the plans and provided in the contract.

This special provision describes the quality management program (QMP) for MSE walls. A quality management program is defined as all activities, including process control, inspection, sampling and testing, and necessary adjustments in the process that are related to the construction of the MSE wall, which meets all the requirements of this provision.

This special provision describes contractor quality control (QC) sampling and testing for backfill density testing, documenting those results, and documenting related production and placement process changes. This special provision also describes department quality verification (QV), independent assurance (IA), and dispute resolution.

Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes sampling and testing procedures. The contractor may obtain the CMM from the department's web site at:

http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm

B Materials

B.1 Proprietary Wire Faced Mechanically Stabilized Earth Wall Systems

The supplied wall system must be from the department's approved list of Wire Faced Mechanically Stabilized Earth Wall systems (Wire Faced MSE Walls).

Proprietary wall systems may be used for this work, but must conform to the requirements of this specification and be pre-approved for use by the department's Bureau of Structures, Structures Design Section. The department maintains a list of pre-approved Wire Faced

Mechanically Stabilized Earth (Wire Faced MSE) Wall systems. The name of the pre-approved proprietary wall system selected shall be furnished to the engineer within 25 days after the award of contract.

To receive pre-approval, the retaining wall system must comply with all pertinent requirements of this provision. Applications for pre-approval may be submitted at any time. Applications must be prepared in accordance to the requirements of Chapter 14 of the department's current LRFD Bridge Manual. Information and assistance with the pre-approval process can be obtained by contacting the Structures Design Section in Room 601 of the Hill Farms State Transportation Building in Madison or by calling (608) 266-8494.

B.2 Design Requirements

It is the responsibility of the contractor to supply a design and supporting documentation as required by this special provision for review by the department to show the proposed wall design is in compliance with the design specifications. Four copies of the following shall be submitted to the engineer for review and acceptance no later than 60 days from the date of notification to proceed with the project.

The plans and shop drawings shall be prepared on reproducible sheets 11 inch x 17 inch, including borders. Each sheet shall have a title block in the lower right corner. The title block shall include the project identification number and structure number. Design calculations and notes shall be on 8 ½ inch x 11 inch sheets, and shall contain the project identification number, name or designation of the wall, date of preparation, initials of designer and checker, and page number at the top of the page. All plans, shop drawings, and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

The design of the Wire Faced MSE Walls shall be in compliance with the *AASHTO LRFD Bridge Design Specifications 5th Edition 2010*, (AASHTO LRFD) with latest interim specifications for Mechanically Stabilized Earth Walls, WisDOT's current *Standard Specifications for Highway and Structure Construction* (Standard Specifications), Chapter 14 of the WisDOT LRFD Bridge Manual and standard engineering design procedures as determined by the department. Loads, load combinations, load and resistance factors shall be as specified in AASHTO LRFD Section 11. The associated resistance factors shall be defined in accordance to Table 11.5.6-1 LRFD.

Design and construct the walls in accordance to the lines, grades, heights and dimensions shown on the plans, as herein specified, and as directed by the engineer. If the wall is installed in front of a bridge abutment or wing, it shall also be designed to resist the applied abutment/bridge lateral forces specified on the contract plans.

Walls parallel to supporting highway traffic shall be designed for the effects of highway surcharge loading equivalent of 2 feet soil surcharge weight or 240 psf. The design shall also consider the traffic barrier impact where applicable. Walls that do not carry highway

traffic shall be designed for a live load surcharge of 100 psf in accordance to Chapter 14 of the WisDOT LRFD Bridge Manual or as stated on the plans.

A maximum value of the angle of internal friction of the wall backfill material used for design shall be assumed to be 30 degrees without a certified report of tests. If a certified report of tests yields an angle of internal friction greater than 30 degrees, the larger test value may be used for design, up to a maximum value of 36 degrees.

An external stability check at critical wall stations showing Capacity Demand Ratios (CDR) for sliding, eccentricity, and bearing checks is performed by the department and are provided in the wall plans.

The design of the Wire Faced MSE Walls by the contractor shall consider the internal and compound stability of the wall mass in accordance to AASHTO LRFD 11.10.6. The internal stability shall include soil reinforcement pullout, soil reinforcement rupture, and panel-reinforcement connection failure at each soil reinforcement level. The design shall be performed using the Simplified Method or Coherent Gravity Method. Calculations for factored stresses and resistances shall be based upon assumed conditions at the end of the design life. Compound stability shall be computed for the applicable strength limits.

The minimum embedment of the Wire Faced MSE wall shall be 1 foot 6 inches, or as given on the contract plan. Frost depth shall not be considered. Additional embedment may be detailed by the contractor, but will not be measured for payment. The wall facings shall be designed in accordance to AASHTO 11.10.2.3. A fine metallic screen and a geotextile filter fabric shall be used at the front face of the wall to retain the fines of the soil mass.

The nominal long term design strength to be used in steel reinforcement and connector design shall consider the corrosion losses and based upon conditions at the end of the design life. The minimum length of soil reinforcement measured from the back face of the wall shall be equal to 0.7 of the wall height or as shown on the plan. In no case shall this length be less than 8 feet. The soil reinforcement shall be the same length from the bottom to the top of each wall section. All soil reinforcement layers shall be connected to facings. The soil reinforcement shall extend 3 feet beyond the theoretical failure plane in all cases. The maximum vertical spacing of soil reinforcement layers shall be 24 inches. The uppermost layer of the reinforcement shall be located between 6” and 12” below the bottom of an overlying slab, footing or top of the wall. The upper layers of the soil reinforcement shall also be checked to verify that they have sufficient tensile resistance against traffic barrier impact where applicable.

Soil reinforcement shall be fabricated or designed to avoid piling, drainage structures or other obstacles in the fill without field modifications. Cutting or altering of the basic structural section of either the strip or grid at the site is prohibited unless approved by the Structures Design Section. A minimum clearance of 3” shall be maintained between any obstruction and reinforcement unless otherwise approved by the Structures Design

Section. Splicing steel reinforcement is not allowed unless approved by the Structures Design Section.

Submit the following to the engineer for review: complete design calculations, explanatory notes, supporting materials, specifications, and detailed plans and shop drawings for the proposed wall system. Sample analyses and hand output shall be submitted to verify the output by the software. The design calculations and notes shall clearly indicate the Capacity to Demand Ratios (CDR) for all internal stabilities as defined in AASHTO LRFD.

The wall submittal package shall be submitted electronically to the engineer and the Structures Design Section. Submit all required information no later than 30 days prior to beginning construction of the wall. The detailed plans and shop drawings shall include all details, dimensions, quantities and cross-sections necessary to construct the walls.

B.3 Wall System Components
Materials furnished for wall system components under this contract shall conform to the requirements of this specification. All certifications related to material and components of the wall systems specified in this subsection shall be submitted to the engineer.

B.3.1 Steel Components
Provide steel reinforcement that meets the following requirements:

B.3.1.1 Welded Wire Fabric Soil Reinforcement
Provide shop fabricated welded wire reinforcement from cold drawn steel wire that has a yield stress of 65,000 psi and conforming to the minimum requirements of ASTM A-82 and be welded into the finished configuration in accordance to ASTM A-185. Replace welded wire fabric that has been damaged during handling, placing or backfilling at the direction of the engineer, at no expense to the department.

B.3.1.2 Steel Reinforcing Strips and Tie Strips
As an alternate to Welded Wire Reinforcing mesh, provide Steel Reinforcing strips or ladder Reinforcing strips or equal, hot-rolled from bars, to the required shape and dimensions meeting the requirements of ASTM A-572 Grade 65 minimum. Tie strips shall be shop fabricated of hot-rolled steel meeting the requirements of ASTM A-1011 Grade 50.

B.3.1.3 Welded Wire Fabric Facing Panels
Provide welded wire fabric that is used to fabricate the facings of the wire-Faced wall that has a yield stress of 65,000 psi. All steel shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of ASTM A-82 and be welded into the finished configuration in accordance to ASTM A-185. Replace welded wire fabric that has been damaged during handling, placing or backfilling at the direction of the engineer, at no expense to the department.

B.3.1.4 Fasteners
High strength bolts meeting the requirements of AASHTO M164 or equivalent.

B.3.1.5 Connector Pins and Mat Bars
Connector pins and mat bars fabricated from cold drawn steel wire meeting the requirements of ASTM A-82.

B.3.1.6 Metallic Screen
Provide a steel metallic screen. The metallic screen should have an approximate opening of ¼" and be made of 0.025" (minimum) diameter welded wire.

B.3.2 Geotextile Filter Fabric
Geotextile filter fabric shall be used behind the metallic screen. Provide two layers of geotextile fabric when called for in the plans. Use geotextile as recommended by the wall manufacturer. If none is recommended, use Type DF (schedule B) as shown in standard spec 645 or as specified on the contract plans. Deliver geotextile fabric in a protective wrap and keep it protected from ultraviolet light until it is incorporated into the work.

B.3.3 Backfill
Furnish and place backfill for Wire- Faced MSE wall as shown on the plans and as herein provided.

Provide and use material that consists of natural sand or a mixture of sand with gravel, crushed gravel or crushed stone. It shall not contain foundry sand, bottom ash, blast furnace slag, crushed/recycled concrete, crushed/milled asphaltic concrete or other potentially corrosive material.

Provide material that conforms to the following gradation requirements as per AASHTO T27.

Sieve Size	% by Weight Passing
1 inch	100
No. 40	0-60
No. 200	0-15

The material shall have a liquid limit not greater than 25, as per AASHTO T89, and a plasticity index not greater than 6, as per AASHTO T90. Provide the percent by weight, passing the #4 sieve.

In addition, backfill material shall meet the following requirements.

Test	Method	Value
pH	AASHTO T-289	5 – 10.0
Sulfate content	AASHTO T-290	200 ppm max.
Chloride content	AASHTO T-291	100 ppm max.
Electrical Resistivity	AASHTO T-288	3000 ohm/cm min.
Organic Content	AASHTO T-267	1.0% max.
Angle of Internal Friction	AASHTO T-236*	30 degrees min. (At 95.0% of maximum density and optimum moisture, per AASHTO T99, or as modified by C.1)

*If the amount of P-4 material is greater than 60%, use AASHTO 236 with a standard-size shear box. Test results of this method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

If the amount of P-4 material is less than or equal to 60%, two options are available to determine the angle of internal friction. The first method is to perform a fractured faces count, per ASTM 5821, on the R-4 material. If more than 90% of the material is fractured on one face and more than 50% is fractured on two faces, the material meets the specifications and the angle of internal friction can be assumed to be 30 degrees. The second method allows testing all P-1" material, as per AASHTO T-236, with a large shear box. Test results of this second method may allow the use of larger angles of internal friction, up to the maximum allowed by this specification.

Prior to placement of the backfill, obtain and furnish to the engineer a certified report of test results that the backfill material complies with the requirements of this specification. Specify the method used to determine the angle of internal friction. This certified report of test shall be less than 6 months old. Tests will be performed by a certified independent laboratory. In addition, when backfill characteristics and/or sources change, provide a certified report of tests for the new backfill material. Additional certified report of tests (except Angle of Internal Friction test), are also required. These additional backfill tests may be completed at the time of material production or material placement, with concurrence of the engineer. If this additional testing is completed at the time of material production, complete testing for every 2000 cubic yards of backfill or portion thereof. If this additional testing is completed at the time of material placement, complete testing for every 2000 cubic yards of backfill, or portion thereof, used per wall. All certified report of these test results shall be less than 6 months old and performed by a certified independent laboratory.

C Construction

C.1 Methods

All excavation and preparation of the foundation for the Temporary Wire Faced Mechanically Stabilized Earth wall shall be in accordance to standard spec 206. The volume of excavation covered is limited to the width of the reinforced mass and to the depth of the bottom of the wall unless shown or noted otherwise on the plan. At the end of each working day, provide good temporary drainage such that the backfill shall not become contaminated with run-off soil or water if it should rain. Do not stockpile or store any materials or large equipment within 10 feet of the back of the wall.

Stagger vertical joints in the welded wire facing.

Compact all backfill behind the wall as specified in standard spec 207.3.6. Compact the backfill to 95.0% of maximum dry density as determined by AASHTO T-99 (modified to compute densities to the nearest 0.1 pcf) or as modified as follows. If the gradation of the granular backfill is such that the P-200 material is less than 7% and the P-40 is less than 30%, a one-point Proctor test can be conducted in place of the 5-point Proctor. To complete this one-point test, compact the sample at a moisture content of 6%, then compute the actual (as-tested) sample moisture after completion of the test. Use Method B or D, and perform this test without removing oversize particles and without correction for coarse particles, as per AASHTO T224. The one-point as-tested moisture content represents the optimum moisture, and the measured one-point density represents the maximum wet density of the material. From these values, the maximum dry density can be computed.

Ensure adequate moisture is present in the backfill during placement and compaction to prevent segregation and to help achieve compaction.

Compaction of backfill within 3 feet of the back face of the wall should be accomplished using lightweight compaction devices. Use of heavy compaction equipment or vehicles should be avoided within 3 feet of the wall face.

Erect welded wire facing and other associated elements according to the wall manufacturer’s construction guide. Place and compact the MSE backfill to the level of the next higher layer of MSE reinforcement before placing the MSE reinforcement or connecting it to the wall facing. Place remaining courses in vertical or battered positions as shown on the contract plans.

The MSE reinforcement shall lay horizontally on top of the most recently placed and compacted layer of MSE backfill. Bending of MSE reinforcement that result in a kink in the reinforcement shall not be allowed. If skewing of the reinforcement is required due to obstructions in the reinforced fill, the maximum skew angle shall not exceed 15 degrees from the normal position unless a greater skew angle is shown on the wall shop drawings. The adequacy of the skewed reinforcement in such a case shall be addressed by supporting calculations.

When the wall is considered temporary (but will have any geotextile material exposed to ultraviolet light for four months or more), or the installation of a permanent wall facing will not occur for four months or more after placement of any geotextile material, cover the exposed geotextile material in the wall as quickly as practical, to prevent damage caused by exposure to ultraviolet light.

C.2 Tolerances

The overall vertical tolerance of the wall and the horizontal alignment tolerance shall not exceed 3 inches per 10 feet for temporary installations.

For battered wire facing, the final deviation from the design batter shall be within ±1 inch for each 10 feet of battered wall height.

C.3 Quality Management Program

C.3.1 Quality Control Plan

Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not perform MSE wall construction work before the engineer reviews and accepts the plan. Construct the project as the plan provides.

Do not change the quality control plan without the engineer's review and acceptance. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in the contractor's laboratory as changes are adopted. Ensure that the plan provides the following elements:

1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication process that will be used, and action time frames.
3. A list of source locations, section and quarter descriptions, for all aggregate materials requiring QC testing.
4. Descriptions of stockpiling and hauling methods.
5. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.
6. Location of the QC laboratory, retained sample storage, and other documentation.
7. A summary of the locations and calculated quantities to be tested under this provision.

C.3.2 Quality Control Personnel

Perform the quality control sampling, testing, and documentation required under this provision using HTCP certified technicians. Have a HTCP Level I Grading Technician, Level I Aggregate Technician, or Assistant Certified Aggregate Technician (ACT) present at the each grading site during all wall backfill placement, compaction, and nuclear testing activities. Have a HTCP Level I Nuclear Density Technician or Assistant Certified Nuclear Density Technician (ACT) perform field density and field moisture content testing.

If an Assistant Certified Technician (ACT) is performing sampling or testing, a certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

C.3.3 Equipment

Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the CMM and maintain a calibration record at the laboratory.

Furnish nuclear gauges from the department's approved product list at http://www.atwoodsystems.com/materials. Ensure that the gauge manufacturer or an approved calibration service calibrates the gauge the same calendar year it is used on the project. Retain a copy of the calibration certificate with the gauge.

Conform to ASTM D 6938 and CMM 8.15 for density testing and gauge monitoring methods. Perform nuclear gauge measurements using gamma radiation in the backscatter or direct transmission position. Perform each test for 4 minutes of nuclear gauge count time.

Split each Proctor sample and identify so as to provide comparison with the department's test results. Unless the engineer directs otherwise, retain the QC split samples for 14 calendar days and promptly deliver the department's split samples to the department

C.3.4 Quality Control (QC) Testing

Perform compaction testing on the backfill. Conform to CMM 8.15 for testing and gauge monitoring methods. Conduct testing at a minimum frequency of 1 test per 150 cubic yards of backfill, or major portion thereof. A minimum of one test for every lift is required. Deliver documentation of all compaction testing results to the engineer at the time of testing.

Perform 1 gradation test every 750 cubic yards of fill and one 5-point Proctor test (or as modified in C.1) every 2000 cubic yards of fill. Provide the region split samples of both within 72 hours of sampling, at the region laboratory. Test sites shall be selected using ASTM Method D3665. Provide Proctor test results to the engineer within 48 hours of sampling. Provide gradation test results to the engineer within 24 hours of sampling.

C.3.5 Department Testing

C.3.5.1 General

(1) The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project, and provide test results to the contractor within 2 business days after the department obtains the sample.

C.3.5.2 Quality Verification (QV) Testing

(1) The department will have an HTCP technician, or ACT working under a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in C.3.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.

(2) The department will conduct QV tests at the minimum frequency of 30% of the required contractor density, Proctor and gradation tests.

(3) The department will locate density tests and gradation samples randomly, at locations independent of the contractor's QC work. The department will split each Proctor and gradation QV sample, testing half for QV, and retaining the remaining half for 10 business days.

(4) The department will conduct QV Proctor and gradation tests in a separate laboratory and with separate equipment from the contractor's QC tests. The department will use the same methods specified for QC testing.

(5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to this special provision, the department will take no further action. If density QV test results are nonconforming, the area shall be reworked until the density requirements of this special provision are met. If the gradation test results are nonconforming, standard spec 106.5 will apply. Differing QC and QV nuclear density values of more than 1.5 pcf will be investigated and resolved. QV density tests will be based on the appropriate QC Proctor test results, unless the QV and QC Proctor result difference is greater than 3.0 pcf. Differing QC and QV Proctor values of more than 3.0 pcf will be investigated and resolved.

C.3.5.3 Independent Assurance (IA)

(1) Independence assurance is unbiased testing the department performs to evaluate the department's QV and the contractor's QC sampling and testing, including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department's independent assurance program. That review may include one or more of the following:

1. Split sample testing.
2. Proficiency sample testing.
3. Witnessing sampling and testing.
4. Test equipment calibration checks.
5. Reviewing required worksheets and control charts.
6. Requesting that testing personnel perform additional sampling and testing.

(2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in C.3.5.4.

C.3.5.4 Dispute Resolution

(1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.

(2) Production test results, and results from other process control testing, may be considered when resolving a dispute.

(3) If the project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product or work, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

C.4 Geotechnical Information

Geotechnical data to be used in the design of the wall is given on the wall plan. After completing wall excavation of the entire reinforced soil zone, notify the department and allow the Regional Soils Engineer two working days to review the foundation.

D Measurement

The department will measure Temporary Wall Wire Faced Mechanically Stabilized Earth Wall LRFD/QMP Pilot by the square foot, acceptably completed, measured as the vertical area within the pay limits the contract plans show. No other measurement of quantities shall be made in the field. Unless the engineer directs in writing, a change to the limits indicated on the contract plan, wall area constructed above or below these limits will not be measured for payment.

E Payment

The department will pay for accepted measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.4740	Temporary Wall Wire Faced Mechanically Stabilized Earth LRFD/QMP Pilot	SF

Payment is full compensation for supplying a design and shop drawings; preparing the site, including all necessary excavation and disposal of materials; supplying all necessary wall components to produce a functional system constructing the retaining system, including drainage system; providing backfill, backfilling, compacting, developing/completing/documenting the quality management program, performing compaction testing; and for covering the geotextile. Parapets, railings, abutment bodies and other items above the wall cap or coping will be paid for separately. Vehicle barrier and its support will be paid separately.

Any required topsoil, fertilizer, seeding or sodding and mulch will be paid for at the contract unit price of topsoil, fertilizer, seeding or sodding and mulch, respectively.

393. Geocomposite Drain Board, Item SPV.0165.4750.

A Description

This special provision describes supplying and installing prefabricated geocomposite drain board as indicated on the plans. Perform work in accordance to pertinent provisions of the standard specifications, the plans, and as hereinafter provided.

B Materials

Use materials that conform to the following:

Physical Properties	Test Method	Value
Thickness		0.25 inch
Flow capacity, (at 3600 psi with I = 1)	ASTM D 4716 (mod)	9 gpm/ft
Geotextile tensile strength	ASTM D 4632	100 lb
Compressive strength	ASTM D 1621 (mod)	10,000 lbs/SF
Mullen burst	ASTM D 3786	Min. 200 lb
Apparent opening size	ASTM D 4751	70
Flow rate	ASTM D 4491	Min 140 gpm/SF

C Construction

Handle the prefabricated geocomposite drainage board in such a manner as to ensure the geocomposite is not damaged in any way. Take care during the placement of the geocomposite not to entrap dirt or excessive dust in the geocomposite that could cause clogging of the drainage system. Deliver, store, and handle the geocomposite in accordance to manufacturer's recommendations. Place and secure geocomposite against the retaining wall back face as indicated on the plans with the fabric facing outward towards the backfill. Make

seams and overlaps between adjacent boards according to the manufacturer's recommendations and specifications.

D Measurement

The department will measure Geocomposite Drain Board in area by the square foot acceptably completed. The department will not pay for repairs to the geocomposite and will not pay for overlap of drain elements.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.4750	Geocomposite Drain Board	SF

Payment is full compensation for furnishing, installing, and trimming all materials; and for furnishing all labor, tools, equipment, fasteners, and incidentals necessary to complete the contract work.

394. Prestressed Precast Concrete Wall Panel, Item SPV.0165.4770.

A Description

This section describes constructing prestressed precast concrete wall panels with thickness and patterns as shown on the plans including product design, fabrication, transportation, erection, and other related items.

These specifications provide for prestressing concrete panels by the pretensioning method. In this method, stress the reinforcing tendons initially, then place and cure the concrete and release the stress from the anchorages to the concrete after developing specified concrete strength.

Design shall be in accordance to the AASHTO LRFD Bridge Design Specifications, Sixth Edition 2012 and applicable interim specifications. The design life of the precast concrete wall panels and all panel components shall be 75 years.

B Materials

B.1 General

Furnish materials conforming to the following:

Masonry Anchors.....standard spec 502
Coated High Strength Bar Steel Reinforcement.....standard spec 505
Pretensioning Reinforcement.....standard spec 503
Welded Steel Wire Fabric for Concrete Reinforcement.....standard spec 505
Structural Steel and Miscellaneous Metals.....standard spec 516
Elastomeric Bearing Pads.....standard spec 506

Galvanize, furnish stainless steel materials for all hardware incorporated into the finished structures.

B.2 Concrete
Furnish concrete as specified in standard spec 501.

Ensure concrete attains a minimum 28-day compressive strength of 5000 pounds per square inch. Base all tests on 6 inch by 12-inch cylinders, or 4 inch by 8-inch cylinders, provided the engineer develops and approves a correlation factor. Mold concrete cylinders in suitable steel or plastic molds. Cure concrete cylinders according to AASHTO T 23, except cure the cylinders with the member until release strength is obtained, then cure the cylinders according to AASHTO T 23.

The contractor shall make and test the cylinders and make available to the engineer all information relating to the making and testing of cylinders. Notify the engineer immediately if concrete cylinder compressive strengths are less than the required 28-day strength. Keep neatly documented records of all cylinder testing on the day of the test and make them available to the engineer. Provide copies of the tests to the engineer by contract completion.

Furnish prestressed concrete panels cast from air entrained concrete. Use type I, IS, I(SM), IP, II, or III cement. The contractor may replace up to 30 percent of type I, II, or III portland cement with an equal weight of fly ash conforming to standard spec 501.2.6 or slag conforming to standard spec 501.2.7. Use only one source and replacement rate for work under a single bid item. Use a department-approved air entraining admixture conforming to standard spec 501.2.2 for air entrained concrete. Use only size No. 1 coarse aggregate conforming to standard spec 501.2.5.4.

The contractor shall determine proportions for the mix within the following limitations:

Water cement ratio	not greater than 0.42
Cement content, pounds per cubic yard of concrete	610-800
Air content of concrete, percent maximum	3.5-6.0

If the mix does not contain a high range water reducer admixture, use a department-approved set retarding admixture as specified in standard spec 501.2.3.2 at the recommended rate if the ambient air temperature is 70 degrees F (21 degrees C) or higher. The contractor may use it if the ambient air temperature is less than 70 degrees F (21 degrees C).

The contractor shall not add more admixtures or water after mixing is complete.

Use admixtures that do not contain chlorides.

Use admixtures that are compatible with all ingredients of the concrete mixture.

B.3 Pretensioning Reinforcement
Use high tensile strength, 7-wire strands conforming to ASTM A 416, grade 270.

B.4 Plant Certification
Obtain all precast concrete wall panels from fabrication plants that comply with the department's plant certification program for prestress concrete, unless the engineer agrees to accept these items according to the alternate procedures set forth in the department's plant certification program.

B.5 Lifting Devices
The type, number and locations of lifting devices and the method of handling the architectural precast panels is determined by the fabricator and approved by the engineer. Do not locate lifting devices in the surface of the panel facing toward the road.

B.6 Accessories and Inserts
Materials:

- Shims: High-density plastic or galvanized steel, 1/8-inch thick, smooth both sides
- Carbon steel plate: ASTM A 283
- Welded headed studs: AWS D1.1 – Type B
- Bolts, nuts, rods, washers: standard spec 506.2
- Joint Material: Closed cell 100% virgin chloroprene (neoprene) filler meeting Division II section 18 of the AASHTO Specifications for Highway Bridges.
- Inserts: Galvanized with minimum 12 Gage steel conforming to ASTM A1011 SS GR 33 or ASTM A653 GR 33 A. Inserts anchors to have 1 1/2-inch minimum cover.

Zinc coated fabrications: Conform to ASTM 385 for fabricating zinc coated work.

C Construction
C.1 Design Requirements
Design panels and components to withstand initial handling, transportation, and erection stress limits; dead loads; wind load of 40 pounds per square foot; thermal stresses; and other loads specified. In addition to the above loads also design inserts and connection assembles for the loads indicated on the plans and a horizontal force equal to at least 20% of the dead weight of the panel.

Provide a minimum prestress of 250 psi and minimum temperature and shrinkage reinforcement as required by AASHTO LRFD Bridge Design Specifications Article 5.10.8.

C.2 Submittals
Erection drawings shall conform to the contract plans and consist of member piece marks and completely dimensioned size and shape of each member; plans and/or elevations locating and defining all products furnished by manufacturer; sections and details showing connections, cast-in items and their relation to the structure; relationship to adjacent material including footings and copings; joints between members and structure; description of all loose, cast-in and field hardware; field installed anchor location

drawings; erection sequences, when required to satisfy stability, and handling requirements; and all dead, live and other applicable loads used in the design.

Production drawings shall conform to the contract plans and consist of elevation view of each member; sections and details to indicate quantities and position of reinforcing steel, anchors, inserts, etc.; handling devices; dimensions and finishes; prestress for strand; concrete strengths; estimated cambers; and methods for storage and transportation.

Submit on request design calculations performed by a registered engineer licensed in the state of Wisconsin experienced in the design of precast prestressed architectural concrete.

Submit samples representative of finished exposed finished face showing typical range of color and texture prior to commencement of production. Samples to be approximately 12 inches x 12 inches and of appropriate thickness and representative of the proposed finished product.

When decorative relief patterns are show on the plans and required to be cast into the face of the panels, provide decorative relief pattern sample panels as required in paragraph C.9.2.

Design modifications necessary to meet performance criteria and field coordination. Variations in details or materials shall not adversely affect the appearance, durability, or strength of units. Maintain general design concept without altering profiles and alignment.

Submit on request reports on materials, compressive strength tests on concrete and water absorption tests on units.

The contractor shall submit to the engineer, for placing on file before commencing, one set of the submittals that the contractor has checked. In addition, provide two sets to the district office and one set to the bureau of structures for inspection purposes. Only then may fabrication commence without awaiting the results of any review the engineer may make. The engineer may refuse prints of submittals that are not clear and legible. If the engineer requests, submit one additional copy of submittals for review. After review, the contractor shall furnish as many copies of submittals as required.

The submittals become a part of the contract, provided any differences between sections on production drawings and sections the plans show are made only if the engineer approves and if the substitution is made at no additional expense to the department.

After initial submittal and review, make no deviation from the production drawings or changes to them without the engineer’s further review.

The engineer's review of submittals means only a review of the character and sufficiency of the details and does not relieve the contractor from responsibility in regard to errors or omissions on those drawings.

C.3 Mock-up
After standard samples are accepted for color and texture, fabricate one full size 10-feet wide x 10-feet high minimum panel meeting the design requirements, illustrating shape and patterns, lap joints, joint filler, lifting devices, inserts, and attachment points. Mockup to be standard of quality for precast panel work, when accepted by engineer. Keep mockup in plant for checking purposes.

C.4 Stressing Procedure
Stressing procedure shall be in accordance to standard spec 503.3.1. Ensure all the strands of a pretensioned member are free from kinks or twists before starting tensioning operations. Ensure no strand unwinds more than one turn after starting tensioning operations.

Perform transfer of prestress to concrete after the concrete develops the minimum required strength for transfer determined by the test cylinders.

C.5 Placing and Fastening Steel
Placing and fastening steel shall be in accordance to standard spec 503.3.1.1. Place all steel units in the position the plans show and hold firmly during concrete placing and setting as specified in standard spec 505.3.

Ensure that all prestressing steel is free of dirt, grease, wax, scale, rust, oil, or other foreign material that may prevent bonding between the steel and the concrete.

C.6 Placing Concrete
Handle and place the concrete as specified in standard spec 502.

C.7 Tolerances
Cast architectural prestressed precast concrete panels to plan dimensions within the following applicable tolerances:

Overall height of panel measured at the face exposed to view ..... ±1/8-inch per 10 ft.
Overall width of panel measured at the face exposed to view ..... ±1/8-inch per 10 ft.
Total thickness ..... ± 1/4-inch
Structural thickness ..... ± 1/4-inch
Variation from square or designated skew ..... ± 1/2-inch
Local smoothness, unconcealed surfaces ..... ± 1/4-inch per 10 ft.
Bowing ..... ± Length/360, to a maximum of 1-inch
Warp (from adjacent corner) ..... ± 1/16-inch per ft.
Location of inserts ..... ±1/2-inch
Tipping and flushness of inserts ..... ± 1/4-inch
Position of handling devices ..... ± 3-inch
Reinforcing steel:
Where position has structural implications or affects
concrete cover ..... ± 1/4-inch
Otherwise ..... ± 1/2-inch

Location of strand:
Perpendicular to panel..... ± 1/4-inch
Parallel to panel..... ±1-inch
Dimensions of architectural features and rustications ..... ±1/4-inch

C.8 Curing
Cure concrete in accordance to standard spec 503.2.2.

C.9 Surface Finish
Unless otherwise indicated on the plans, provide a rubbed surface finish on the exposed surfaces of prestressed concrete panels as specified in standard spec 502.3.7.3 before shipping from the plant. Exposed face to match approved mockup panels. Use rigid molds to maintain panels within specified tolerances conforming to shape, lines, and dimensions shown on the production drawings. Construct molds to withstand vibration method selected.

Coat bottom of panels with bitumastic after cutting strands flush. Do not coat top of panels.

C.9.1 Decorative Relief Patterns
When shown on the plans, provide prestressed precast panels with decorative relief patterns, decorative form liner treatments, or textured surface finishes as shown in the plans. The exposed surfaces must match approved sample panels. Electronic files of the decorative patterns are available from Wisconsin Department of Transportation, James Keegan, P.E., 141 NW Barstow Street, Waukesha, Wisconsin 53187, (414) 750-3311.

C.9.2 Decorative Relief Pattern Sample Panels
When the plans call for prestress precast panels with decorative relief patterns, decorative form liner treatments or textured surface finishes, supply to the engineer a minimum of two non-production test panels with the decorative details as shown in the plans. Sample panels shall be at nominally 5 feet by 5 feet or larger in size to sufficiently demonstrate the finished appearance of the decorative relief pattern shown in the plans. The submitted test panels shall fit together to demonstrate the continuation of the decorative relief patterns, form liner treatments, and textured surface finishes across vertical panel joints. Obtain the engineer's acceptance of the decorative patterned sample panels, prior to production of the decorative relief patterned panels required for the contract. Only one set of accepted decorative sample panels for prestressed precast concrete wall panels is required per contract.

C.10 Erection
Erect panels without damage to shape or finish. Replace or repair damaged panels.

Place precast concrete wall panels so that their final position is vertical. Ensure that the vertical joint openings between panels are uniform and that decorative patterns between panels are aligned.

When panels require adjustment beyond design or tolerance criteria, discontinue affected work; advise engineer.

Verify structure, footings, anchors blocks, rods, couplers, clevises, and other anchor devices are ready to receive panels. Verify that wall panel footings are placed at the proper horizontal and vertical alignments and are ready to the receive wall panels. Place elastomeric pad and shims behind panels to ensure proper horizontal alignment. Set panels on elastomeric bearing pads and shims and install base angles at ends of panels. Shim vertical joints to get proper opening. Install and compress neoprene joint filler in the lap joints between panels. Fasten top of panels to deadman anchor block assembles at MSE walls, to top of drilled shafts at secant pile walls, and to top of concrete at existing walls, as shown on the plans.

Touch-up scratched or damaged galvanized surfaces.

C.11 Erection Tolerances

Plan location from wall reference line ..... ± 1/2-inch
Plan location from wall alignment ..... ± 1/2-inch
Top elevation from nominal top elevation ..... ± 1.4-inch
Support elevation from nominal elevation:
- Maximum low 1/2-inch
- Maximum high 1/4-inch

Plumb in any 10 ft. of panel height ..... ± 1/4-inch
Maximum offset of matching edges and decorative patterns ..... ± 1/4-inch
Maximum offset of matching faces ..... ± 1/4-inch
- Joint width (governs over joint taper) ..... ± 1/4-inch

Joint taper maximum ..... ± 3/8-inch
Joint taper over 10 ft. length ..... ± 1/4-inch
Differential bowing or camber as erected between adjacent members of the same design ..... $\pm$ 1/4-inch

C.12 Adjusting

Adjust panels so joint dimensions are within tolerances.

D Measurement

The department will measure Prestressed Precast Concrete Wall Panel as set forth in the contract plans without measurement thereof. Any modifications to the contract quantity caused by corrections or revisions of the original contract plan, which have been approved by the engineer, will be measured by the square foot on a vertical plane between a line at the finished grade in front of the panel and a line indicating the top of wall including wall cap or coping as shown on the plans. Unless ordered by the engineer, panel area below or above these lines will not be measured for payment.

E Payment

The department will pay for measured quantities at the contract panel price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.4770	Prestressed Precast Concrete Wall Panel	SF

Payment is full compensation for preparing the design drawings and calculations, production drawings, and coordination; for providing prestressed precast wall panels, including all concrete, grout, mortar, reinforcement steel, tie bars, bearing pads, shims, masonry anchors, filler, anchor plates, angles, slotted inserts and other embedded metal; for casting, curing and finishing concrete; for providing decorative relief patterns, decorative form liner treatments and textured surface finishes; providing sample panels; for jacking and prestressing; and for furnishing all handling, hauling and erecting. Parapets, railings, abutment bodies and other items above the wall panel cap or coping will be paid for separately. Deadmen anchor blocks, rods, couplers and clevises will be paid for separately. Construction of foundations and excavation will be paid for separately.

395. Shaft Excavation Support System, Item SPV.0165.8095.

A Description

This special provision includes the requirements to design, furnish and install, and remove when applicable, the excavation support system for working shafts at proposed manholes Z2683, Z2791, Z2815, Z2817, Z2820 and Z2822. This special provision also includes the requirements to maintain shaft at manhole Z2683 until project 1060-33-81 contractor is mobilized. The contractor shall design and construct each shaft excavation support system as recommended in the Geotechnical Baseline Report and in accordance to requirements in this special provision.

A.1 Qualifications of the Contractor

The contractor's excavation support system design engineer shall be a professional civil engineer registered in the State of Wisconsin and shall have at least ten years of experience in design and construction of excavation support system similar to the contractor's proposed system. This engineer is referred to herein as the contractor's engineer.

A.2 Design Criteria

All ground support system elements including shoring and bracing of shaft excavations shall conform to the requirements of Subpart P, Excavations (1926.650 of 29 CFR) of the Occupational Safety and Health Administration (OSHA).

The design shall provide bottom stability and system stiffness sufficient to meet the contract requirements for control of water and for protection of adjacent work and property. The design shall be compatible with the contractor's selected methods of excavation and control of water. The design shall provide for placement of excavation support systems and removal of the excavation support systems where required and feasible. The design shall provide for construction of the permanent work, and all other construction operations and requirements.

Design shaft excavation support systems and working slabs to withstand earth pressures, groundwater pressures, bottom heave, equipment loads, thrust block loads from pipe jacking, loads from making a portal for tunneling, applicable traffic and construction

loads, and other surcharge loads to allow the safe construction of the tunnel without movement or settlement of the ground, and to prevent damage to or movement of adjacent structures, streets, and utilities. Design excavation support systems to be compatible with the geologic conditions described in the Geotechnical Baseline Report and in accordance to AISC and ACI code provisions, as applicable.

- Select shaft geometry, size, and type of excavation support system per plans and Geotechnical Baseline Report.
- Design each member or support element to support the maximum loads that can occur during construction with appropriate safety factors. The maximum combination of loads or stresses shall be no larger than 67% of the yield strength of the structural members.
- Design the support system to minimize horizontal and vertical movements, as per limits delineated in the special provisions, article Geotechnical Instrumentation, and to protect adjacent utilities from damage. The type and stiffness of each ground support system and the methods of ground support installation shall be designed and constructed in order to meet the ground movement limits and adjacent property protection requirements as specified in the special provisions, article Geotechnical Instrumentation.
- Design support system to maintain the stability of the excavation against sliding or bottom heave. Provide a minimum factor of safety against sliding of 1.5. Provide a minimum factor of safety against bottom heave due to adjacent surcharge pressures and hydrostatic uplift pressures or upward seepage pressures of 1.5.
- Employ combinations of walers, struts, tie-back anchors and beams for bracing and lateral support as required to support excavation faces and control groundwater and prevent loss of ground with soldier piles and lagging, liner plate, or other methods of ground support. Provide struts with intermediate vertical and horizontal supports to prevent buckling. Trench shields and/or speed shores are not allowed for shaft construction.
- Design a gravel pad or concrete working slab equipped with a sump to pump out construction water and storm water for shaft excavation bottoms to provide stable support for construction operations.
- Design for shaft sizes indicated on the drawings.
- Design shaft at manhole Z2683 for steel ribs and gasketed liner plates and for drained soil condition. Design consideration for hydrostatic pressure shall be coordinated with contractor’s water control plan.

The support system shall be designed to ensure that no earth or other loading will be placed on the new structures prior to substantial completion of them and until design strength has been reached. The contractor shall be solely and completely responsible for any damage or loss due to premature loading of the new structures.

The design shall specify the following items as a minimum: the quality of materials to be used for excavation support systems; constraints on maximum excavation limits relative to support installation steps; tolerances for size and position of ground support elements; required preloading of excavation support elements; restrictions on surcharge loads and

other loads that may act on the excavation support system such as jacking forces and grouting, and groundwater pressures; ground support system and adjacent ground movement limits; provisions for subgrade stability and protection; and constraints on removal of support system elements as the permanent work is constructed and backfilling is completed.

B Materials

Materials used in construction of the shaft excavation support systems shall meet these requirements:

- All timber and structural steel used for the supporting systems, whether new or used, shall be sound and free from defects that may impair their strength.
- Structural Steel: Conform to ASTM A572 Grade 50 unless approved otherwise.
- Timber: All timber shall be structural grade with a minimum allowable flexural strength of 1,100 psi.
- Steel Segments (Liner Plates): Segments shall be accurately bent to the approved shape for the proper radius of tunnel section. Rib segments shall fit closely and have bolted butt-plate joint connections. Each plate of every 4th ring fitted with a minimum 1-1/2-inch diameter grout pipe. All steel appurtenances required for the installation of the segments such as bolts, gaskets, shims, spacers, and other necessary accessories shall be provided with the segments. Segments (liner plates), channels, plates, rods, and accessories shall be structural steel conforming to ASTM A36 or ASTM A572. Bolts shall conform to ASTM A325 or A449. Nuts shall conform to ASTM A307, Grade A.
- Contact Grout: Conform to special provisions, article Contact Grouting.
- Anchor Tendons: Conform to ASTM A615 for Grade 60 or 75 or ASTM A722 for Grade 150
- Anchor Grout: The grout shall be a pumpable neat mixture of cement and water and shall be stable (bleed less than 2 percent), fluid, and provide a minimum 28-day compressive strength as per contractor's design. Grout material shall conform to the requirements of standard spec 501.2. Use Type I Portland cement.

C Construction

C.1 Submittals

C.1.1 General

Prepare and submit qualifications, shop drawings and work plan at the preconstruction meeting or at least 14 calendar days prior to beginning shaft construction, whichever date is earlier. The engineer will accept the submittal as submitted or return the submittal with requested revisions. Do not start any work until the engineer provides acceptance of qualifications, shop drawings and work plan. Acceptance of the submittals does not relieve the contractor of responsibility for successful completion of the shafts.

C.1.2 Subsurface Conditions

The contractor review the Geotechnical Baseline Report – South Leg Storm Sewer – Manholes Z2822 to Z2431 (referred as "Geotechnical Baseline Report" herein) for the subsurface conditions.

C.1.3 Submittals for Approval

Excavation Support System Design Engineer Qualifications: Submit written documentation (including evidence of professional registration in the State of Wisconsin) as supporting evidence of the qualifications of the contractor's engineer.

Shop Drawings and Work Plan: Submit plans and shop drawings for shaft excavations, excavation support systems, and other related information. Drawings and calculations shall be prepared and sealed by the contractor's engineer. As a minimum, the submittal shall contain the following information:

- Construction method to be used for the installation of each system, including sequence of installation and equipment description.
- Detailed construction sequence for shafts at manholes Z2683, Z2791, Z2815, Z2817, Z2820 and Z2822, at a minimum, addressing penetration of the existing storm sewer pipes, maintenance of existing pipe flow throughout construction course, construction of proposed pipes and manholes, and construction of tunnel.
- Shop drawings and design calculations showing assumed loading conditions, estimated ground movements, system component design, arrangement of supports and construction sequence for proposed support system(s). Show the elevation of struts, braces, or other supports as related to the depth of excavation at intermediate stages of construction. Provide details of bottom slab, drains, and sump construction. Indicate sizes, shapes, and material specifications for all support elements including lagging, if used. Calculations shall include estimates of likely deflections or deformations of the support system and maximum tolerable values. Calculations shall also show the shaft wall is able to sustain the maximum jacking forces transferred from the thrust block during pipe jacking.
- The design and submittal of soldier piles and laggings for shaft excavation support shall, as a minimum, address : interference with utilities; drilled hole advancement, including drilling equipment type, expected hole diameters and methods of maintaining hole stability; structural design of soldier piles, including size, weight, steel grade, depth, and backfill of hole; method of shaft excavating; method of removing boulder obstructions; method of lagging installation and overcut backfilling or contact grouting; and design and installation of any internal bracing or tie-backs.
- The design and submittal of steel ribs and laggings/ liner plates for shaft support shall as a minimum, address : interference with utilities; structural design of steel ribs and laggings/ liner plates, including size, weight, steel grade, depth; liner plate details, including geometry, joints, connectors (bolts and dowels), compression packings, gaskets, inserts, and accessories; method of assembly; method of shaft excavating; method of removing boulder

obstructions; method of lagging/liner plate installation and overcut backfilling or contact grouting; design.

- A site plan for each shaft indicating utilities, use of access roads, site grading and site development details for the excavation and all work areas, and the proposed limits of disturbance surrounding each excavation.
- Portal plans indicating support installed to maintain ground support system integrity and stability of the excavation when commencing tunneling and when holing through. Provide details of the portal bracing, seal and ground improvement (if used) needed for face stability and tunnel launching.
- A work plan for shaft at manhole Z2683 showing tasks, maintenances, contingency plan of repairs to damaged excavation support elements, safety monitoring and control for the period between completion of project 1060-33-80 construction and mobilization of project 1060-33-81 contractor.

C.1.4 Information Submittals

Contractor's Engineer Certification: Submit to the engineer, no later than the 5th day of each month, a signed and sealed certification (letter, memorandum, or report) by the contractor's engineer that, based on his/her observations, the work completed during the previous month pertaining to design was installed and is performing substantially in accordance to the design concepts prepared by him/her. The contractor's engineer shall also report any significant deviations from the submitted design concepts, any performance concerns observed and actions recommended remediating these items. The contractor's engineer certifications shall be made monthly during a period commencing with the start of excavation and ground support system installation, continuing during portal excavation and pipe jacking operations and ending when the ground support system has been abandoned and backfilled or removed and backfilled.

As-built Plans: Submit as-builts of abandoned excavation support systems.

C.1.5 Acceptance

The engineer will evaluate the Submittals for Approval with the requirements of this special provision. Within 14 calendar days after receipt of the Submittals of Approval, the engineer will notify the contractor of the acceptance of the submittal, or if additional information and/or changes are required. Any unacceptable part of the Submittals of Approval will require resubmission. The contractor must resubmit the Submittals of Approval for evaluation and review with the necessary changes or additional information provided. The engineer will provide a written notice of acceptance or rejection of contractor's resubmitted Submittal for Approval within 14 calendar days after its receipt.

After the engineer's acceptance of Submittal of Approval, no changes to the Submittal of Approval can be made without written consent of the engineer.

All Information Submittals should be submitted to the engineer. The engineer can reject the submittals which do not adequate detail, as required herein. The contractor shall resubmit the rejected submittals within 7 days upon the receipt of the engineer's rejection notice.

C.2 General Shaft Construction Requirements

The contractor shall review the plans and special provisions of this project to coordinate with utility and abandonment relocation work adjacent to the shaft prior to shaft construction. The contractor shall also provide support and maintain live utilities which penetrate through shaft excavation areas and remove man-made objects and abandoned utilities within the shaft excavation, as discussed in the Geotechnical Baseline Report and as shown in the plans. The effort, material, and labor required to remove, support or avoid the utilities and underground structures during shaft construction shall be deemed as incidental work to shaft construction and shall be at no additional cost to the department.

Excavation support systems for shafts shall consist of drilled-in soldier piles and laggings and steel ribs and laggings/liner plates at shaft locations recommended in the Baseline Report.

The contractor shall design and install shaft ground support systems in accordance to the contract documents and approved submittals. The contractor shall furnish materials for installing, monitoring, maintaining, and removing ground support systems. The contractor's engineer shall maintain involvement and responsibility from design through installation, performance and abandonment or removal of ground support systems.

The contractor shall implement groundwater control measures, as required in the special provisions, article Control of Water. Installation of excavation support systems shall not be done without groundwater control measures.

Whenever necessary to prevent caving during excavation to protect adjacent structures, property, workmen, and the public, adequately support and brace excavations. All shoring and bracing of excavations shall conform to the safety requirements of the Federal, State, or local public agency having jurisdiction over such matters. The most stringent of these requirements shall apply.

The contractor shall install support systems to permit the safe execution of the work, and to ensure that no ground loading or other loading will be placed on the new work prior to completion and until design strength of the structure being constructed has been reached. During periods of shutdown, fully support the walls of excavations to prevent lost ground. The contractor shall install excavation support systems to minimize loss of soil into the excavations; minimize ground movements outside of the excavations; maintain stability of the excavations; preserve the in situ strength of surrounding soils; to limit construction included vibration. Control vibrations from boulder splitting or installation and removal of excavation support elements to prevent damage to the work and adjacent property. Ground movement and vibration shall be monitored as per special provisions, article Geotechnical Instrumentation.

Skin tight contact between the ground and the soldier pile and lagging system or the steel ribs and lagging/liner plate system is required and is to be maintained by the contractor's selected means, such as blocking, cribbing, wedging, grouting, or such other means compatible with the design of contractor's engineer. For overcut voids over 1/2 inch wide, the contractor shall promptly complete contact grouting as specified in the special provisions, article Contact Grouting. Contact grouting shall be performed to control ground movement into the excavation, and to provide firm and uniform contact between the support system and the ground. Grout holes shall be located as necessary to accomplish the work.

C.4 Drilled-in Soldier Pile and Lagging Wall

The contractor shall design soldier pile and lagging wall to allow the penetration of the existing storm sewer pipe. The contractor shall install soldier piles through pre-drilled holes and fill in with concrete. Driven soldier piles are prohibited.

The soldier piles shall be installed within 2 inches from the planned location. The contractor shall replace soldier piles not located within tolerance or damaged due to any cause at no additional cost to the department.

Based on the design of contractor's engineer, soldier piles shall be secured against horizontal or vertical movements or distortion. Laggings shall be assembled true to the lines and grades presented on the approved shop drawings.

Install laggings in conformance with the manufacture's recommendations and in a manner that will not deform or overstress the soldier piles. The contractor shall prevent laggings from deflecting more than contractor's design deflection.

Prior to allowing excavation to stand overnight, advance the laggings to 1 feet above the excavation line and contact grout.

C.5 Steel Ribs and Laggings/Liner Plates

The contractor shall design and install steel ribs and laggings/liner plates to allow the penetration of the existing storm sewer pipe. The contractor shall install steel ribs and laggings/liner plates as per approved shop drawings and in conformance with the manufacture's recommendations. The contractor shall design and install gasketed liner plates for shaft at manhole Z2683 to provide sealed joints.

The contractor shall be prepared to handle wet sand seams and lenses during installation of steel ribs and laggings. The contractor shall avoid ground loss from unstable wet sand seams and lenses, if encountered.

Unsupported excavation to stand overnight is prohibited. The steel ribs and lagging/liner plate system shall be advanced to the bottom of the excavation prior to the end of each work day.

C.6 Bracing System

The contractor shall install bracing system consisting of walers, struts or tie-back anchors in the sequence as specified by the contractor's engineer.

Install steel supports true to the line and grades as per approved shop drawings. The contractor shall install steel plates to ensure firm contact between walers (if used) and the soldier piles.

If tie-back anchors are used, the requirements herein shall be followed.

Tolerance: The tie-back anchors shall be positioned plus or minus 6 inches from the theoretical elevation shown in the shop drawings. At the point of entry, the anchor shall be installed within plus or minus 3 degrees of the inclination from horizontal shown in the shop drawings. Minimum grout cover for tendons shall be ½ inch. Tie-back anchors which do not satisfy the specified tolerances will be replaced at no additional cost to the department.

Anchor hole drilling: Anchor holes shall be drilled at the specified locations, angles, lengths and minimum diameters shown on the shop drawings. Over-drilling of holes shall be utilized only if described in approved work plan. The contractor shall check orientation of anchor hole prior to and during drilling. Drilling mud or foam shall not impact ground anchor load transfer.

Anchor tendon installation: Immediately prior to tendon installation, flush hole with water to provide saturated soil and concrete surfaces, remove standing water in bottom of hole, and sound hole for compliance with required length. Tendons shall be free of dirt, loose rust, grease, or other deleterious substances and placed in accordance to approved shop drawings. The contractor shall provide rigid and adequate support during placement of grout. The tendon bars shall be continuous, without splices or welds

Anchor grouting: The contractor shall place a separate bondbreaker if a corrugated sheath is used or if recommended by the manufacturer. Pump grout to bottom of hole through clean and leak-free grout pipes. If grout inside the sheath is not pre-manufactured, the contractor shall grout area outside and inside the sheath simultaneously and maintain grout at the same level both inside and outside of the sheath. Grout volume shall be measured and compared to theoretical volume to avoid overfilling hole. Continuously monitor the location of the grout surface using a measuring rod extending through the holes in the tendon base plate to verify that grout is at correct distance from the excavation face. Maintain the tip of the grout pipe below grout surface at all times to avoid entrapping air. After grout operation is complete, allow tendon to remain undisturbed until grout has cured for the time required to reach minimum specified strength, as determined by ASTM C942. If ungrounted length is longer or shorter than the specified length by 1 foot or more, perform following remedial action:

a. Remove tendon, flush hole, and redrill if necessary or remove grout to the required elevation.
b. Replace tendon with new tendon if damaged.

Tendon Stressing: Do not tension tendon before grout has cured for minimum specified time and has attained required strength. Tension tendon by means of equipment recommanded and furnished by tendon manufacturer.

C.7 Removal of Excavation Support Systems

The contractor shall remove all elements of excavation support systems extending between the ground surface and 6 feet below the existing or the proposed ground surface, whichever is lower. Repair any settlement or damage to the work or to adjacent property as a result of removing excavation support systems. Excavation support systems that cannot be safely removed and without causing settlement or damage to the work or adjacent property shall be left in place, at no additional cost to the department.

If backfill material is loosened to an extent that it settles more than one inch as a result of attempts to remove ground support members, the contractor shall be responsible for remedial measures to re-compact or consolidate the loosened backfill. The contractor's engineer shall be responsible for determining if ground support system can be safely removed. Excavation support system elements that are left in place shall be at the contractor's expense. Restoration of any damage and the cost of remediating disturbed backfill or adjacent property damage caused by removal of ground support systems shall be at the contractor's expense.

C.8 Shaft Backfilling

Backfill shafts in accordance to standard spec 206.3.13. Backfill around the pipe inside the shaft shall be in accordance to standard specs 209.2, 520.3.2 and 520.3.4.

D Measurement

The department will measure Shaft Excavation Support System by the square foot, acceptably completed. Additional excavation beyond the limits of the plan dimensions will not be measured for payment unless authorized and agreed to in advance of placement by the department.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.8095	Shaft Excavation Support System	SF

Payment for Shaft Excavation Support System is full compensation for furnishing, installing, and removing excavation support systems for both working shafts, including but not limited to: excavation; all elements of excavation support systems; removing encountered boulders and known or unknown abandoned man-made objects (regardless of quantities); ground improvements; ancillary work for tunnel portals; providing and placing backfill; shaft base material compaction and work slab; removal of excavation support systems; disposing of surplus material; and for equipment mobilization/demobilization.

396. Joint Sealing, Item SPV.0180.0101.

A General

This special provision describes the minimum requirements for preparing the pavement joint or crack, and furnishing and installing the sealant. Seal all expansion, hand-formed, and sawed joints in the pavement. Also, seal all bond or construction joints.

B Materials

Joint sealer shall comply with the requirements of ASTM Designation D3405. Joint sealer shall be composed of a mixture of materials that will form a resilient and adhesive compound capable of effectively sealing joints in concrete against the infiltration of moisture and foreign material throughout repeated cycles of expansion and contraction with temperature changes, and of a mixture that will not flow from the joints or be picked up by vehicle tires at summer temperatures. The material must be capable of being brought to a uniform pouring consistency suitable for completely filling the joints without inclusion of large air holes or discontinuities.

The joint sealer shall be elastic type but poured; melt by using indirect heat in suitable equipment provided with positive temperature control and mechanical agitation. Do not damage the material when heating it to the temperature required for satisfactory pouring.

When applying the joint sealer, the atmospheric and concrete temperature will be above 40° F.

C Construction

C.1 Preparation of Pavement Joint or Crack

Clean the pavement joint or crack of all foreign material prior to the installation of the joint sealer. Completely remove the slurry resulting from the sawing operations from the joint by blowing it clean with compressed air (minimum air pressure – 80 pounds per square inch). Joints shall be dry prior to applying joint sealer.

D Measurement

The department will measure Joint Sealing by the area of square yards of pavement, sealed acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0101	Joint Sealing	SY

Payment is full compensation for the cost of and placement of the sealant; for cleaning the joint or crack; for removing slurry and blowing the joint clean.

397. Concrete Pavement Repair Special, Item SPV.0180.0102.

A Description

This special provision describes excavating, grading, compacting, and finishing necessary to accommodate Concrete Pavement Repair Special including rehabilitating existing storm sewer structures as shown on the plans and in accordance to the pertinent requirements of the standard specifications, and as hereinafter provided.

Rehabilitating existing storm sewer work consists of removing existing shoulder pavement by saw cutting, removing, handling, storing and reinstalling existing storm sewer structure frames, grates or lids, excavating and filling voids with backfill material, compacting, and replacing shoulder pavement with high early strength concrete and details as shown on the plans.

B Materials

Conform to standard spec 416.2.

C Construction

Conform to standard spec 416.3 and as modified in this special provision.

Backfill all subgrade voids beneath the repair area using compacted Base Aggregate Dense. Obtain approval of the engineer before using Backfill Controlled Low Strength. to backfill voids that cannot be compacted with standard equipment.

Adjust and reset any castings for all drainage structures within the repair area prior to the placement of the Concrete Pavement.

D Measurement

The department will measure Concrete Pavement Repair Special by the square yard, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0102	Concrete Pavement Repair Special	SY

Payment for the Concrete Pavement Repair Special item is full compensation for furnishing, hauling, preparing, placing, curing, and protecting all materials; for removing and disposing of existing pavements and excavated materials; for repairing asphaltic shoulders; for sawing joints; for tie bars and dowel bars provided and placed in the repair area; for sawing existing pavement for removal; for removing, handling, storing, reinstalling frames, grates or lids; for adjusting castings; for preparing the foundation; for backfilling; and for testing concrete cylinders. Replace all covers that are unusable due to the contractor’s operations, at no expense to the department. The department will pay for

individual repairs the width of the existing concrete lane or shoulder and less than 300 feet long as Concrete Pavement Repair Special.

The department will pay for Base Aggregate Dense and/or Backfill Controlled Low Strength separately under the respective bid items.

398. High Friction Surface Treatment Concrete, Item SPV.0180.0103.

A Description

This special provision describes providing a High Friction Surface Treatment (HFST) composed of aggregate in a resin binder on concrete pavements.

B Materials

B.1 Resin Binder

Supply a resin binder which is compatible with the pavement type, bonds to the pavement surface, holds the aggregate firmly in place in a broad range of climates including below-freezing temperatures, and meets the requirements specified in Table 1. Apply a primer before applying the binder if recommended by the supplier or manufacturer.

Table 1. Resin Binder Properties

Property	Requirements	Test Method
Viscosity	7 – 70 poises	ASTM D2196
Gel Time	10-minute minimum	ASTM C881
Ultimate Tensile Strength	2,000 – 5,000 psi @ 7 days	ASTM D638
Elongation at Break	30% - 80% @ 7 days	ASTM D638
Compressive Strength	≥ 1000 psi @ 3 hrs and ≥ 5000 psi @ 24 hrs	ASTM D695
Water Absorption	≤ 1.0 % @ 24 hrs	ASTM D570
Shore D Hardness	65 - 75	ASTM D2240
Cure Rate	≤ 3 hours	ASTM D1640

For application on concrete pavements, test for thermal compatibility between the resin binder and the concrete according to ASTM C884. The resin binder is unsuitable if there is any debonding between it and the concrete.

B.2 Aggregates

Furnish natural aggregates, synthetic aggregates, or industrial by-products that have a proven record of performance in applications of this type. Industrial by-products shall conform to category 1 or 2 under NR 538.08 of the Wisconsin Administrative Code.

Ensure that aggregates are resistant to polishing and crushing; clean and free of surface moisture; fractured or angular in shape; free from silt, clay, asphalt, or other organic materials; compatible with the resin binder; and meet the properties and gradation requirements in Tables 2 and 3.

Table 2. Aggregate Properties

Property	Requirements	Test Method
Moisture Content	≤ 0.2%	AASHTO T 255
Fine Aggregate Angularity	≥ 45%	AASHTO T304, Method A
Micro-Deval	≤ 15% loss	ASTM D7428
LA Wear	≤ 10% loss @ 100 revolutions and ≤ 35% loss @ 500 revolutions	AASHTO T 96
Freeze-Thaw Soundness	≤ 12% loss @ 50, 16, or 25 cycles using Procedure A, B, or C, respectively	AASHTO T 103

Table 3. Aggregate Gradation

Sieve Size	% Passing by Weight
No. 4	100
No. 8	30-75
No. 16	0-5
No. 30	0-1

B.3 Required Properties of the High Friction Surface Treatment Concrete
Provide a HFST with the properties shown in Table 4.

Table 4. HFST Properties

Property	Requirements	Test Method
Surface Friction (Microtexture) - British Pendulum	BPN ≥ 65	ASTM E303
Sideway Friction Force	≥ 0.7	ASTM E670
Macrotexture Depth – Sand Patch Method	≥ 1 mm (0.039 in)	ASTM E965

B.4 Approval of High Friction Surface Treatment
A minimum of 10 business days before applying HFST, submit documentation that the materials meet the requirements of Tables 1, 2, 3, and 4 to the engineer for approval. Documents must be dated within three years. If the engineer requests, provide samples of resin binder and aggregate for department testing before applying HFST. If using industrial by-products as aggregate, submit a certificate of compliance certifying which category the material conforms to under NR 538.08 of the Wisconsin Administrative Code.

C Construction
C.1 General
Conduct a meeting with appropriate supplier or manufacturer representatives before applying HFST to establish procedures for maintaining optimum working conditions and coordination of the work. Provide recommended application procedures to the engineer.

Ensure the pavement surface is sound. Test concrete pavements for adequate bond strength according to ACI 503R Appendix A. The surface is acceptable if the tensile bond strength is at least 250 psi in 24 hours.

Ensure that the resin binder components maintain their original properties during storage and handling. Store all aggregates in a dry environment and protect from contaminants on the job site.

C.2 Pavement Surface Preparation

C.2.1. Pavement Surface Repair

Remove unsound pavement as the plans show or the engineer directs.

Ensure that products used for pavement repairs or patches are compatible with the resin HFST and are fully cured before placing the HFST. Do not apply HFST to new concrete pavement until after it has been in place for at least 30 calendar days.

C.2.2 Surface Preparation

Cover and protect utilities, drainage structures, expansion joints on bridge decks, and other structures within or adjacent to the application location to prevent materials from adhering to or entering those structures.

Remove pavement markings that are within the treatment area by one or a combination of scarification, grinding, or sand blasting. Cover existing pavement markings adjacent to the application if they are to remain in place.

Seal joints and cracks greater than 1/4 inch wide with a joint sealant conforming to ASTM D6690.

Completely remove any grease, oil, or other foreign matter that rests on, or has absorbed into, the pavement surface by one or a combination of scarification, grinding, sand blasting or shot blasting.

Prepare the surface by sweeping, vacuuming, and blowing with oil-free compressed air no more than 24 hours before applying HFST. Ensure the surface is clean, dry, and free of all dust, oil, debris and other material that might interfere with the bond between the resin binder and the existing pavement surface.

Keep vehicles and unnecessary equipment off the cleaned surface. Apply HFST as soon as possible after cleaning is completed.

Adhere to additional supplier or manufacturer recommendations for surface preparation.

C.3 Application of the High Friction Surface Treatment

Ensure that a supplier or manufacturer representative is present to provide technical assistance during the application of the HFST.

Do not apply the HFST if any of the following exists:

- Pavement surface is wet or not sufficiently clean.
- Ambient air temperature is below supplier or manufacturer recommendations.
- Rain is predicted before HFST application will be completed.
- Pull-off or bond strength is inadequate

Close treatment areas to traffic until after the HFST is completely cured.

Construct HFST to the full width of the existing pavement surface or as the plans show or engineer directs. Apply as a single layer 1/8 inch to 1/4 inch thick.

Heat and mix the resin binder components according to supplier or manufacturer instructions using equipment capable of providing the desired results. The department will reject overheated or otherwise damaged resin material.

Apply the resin binder uniformly over the pavement surface manually or with automated equipment. Use an application rate recommended by the supplier or manufacturer. Adjust, if needed, based on the pavement surface type and condition. Use enough resin to cover the pavement surface and bind the aggregate, but not so much that it covers the aggregate and creates a slick surface.

If applying binder with an automated sprayer, ensure that the equipment features positive displacement, volumetric metering, and is capable of storing, mixing, heating, monitoring, and distributing the binder components at the proper mix ratio. Adjust the pressure and the speed of the equipment according to the application rate, and the size, angle, and bar height of the spray nozzles.

Conduct operations in a manner that will not contaminate the wet binder or allow the binder material to separate or cure, and impair bonding of the aggregate.

Immediately after applying the resin binder, distribute the dry aggregate over the entire surface using a standard chip spreader or equivalent machine that can provide uniform, consistent coverage. Immediately cover areas that have excessive binder with additional hand broadcasted aggregate.

Allow the HFST to properly cure, adhering to recommendations for minimum cure times.

After the HFST is fully cured, remove excess loose surface aggregate by sweeping, blowing, or vacuuming. Do not tear or otherwise damage the surface. Excess recovered aggregate can be reused if clean, uncontaminated and dry. Repair damaged areas or areas with excess or insufficient aggregate coverage. Clean expansion joints, utilities, and drainage structures of all debris before opening to traffic.

Additionally, within 3 to 7 days after opening to traffic, remove loosened aggregates from the high friction surface area, the shoulders, and any other areas within or immediately adjacent to the HFST site.

D Measurement

The department will measure High Friction Surface Treatment Concrete by the square yard, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0103	High Friction Surface Treatment Concrete	SY

Payment for High Friction Surface Treatment Concrete is full compensation for providing the HFST; for testing materials; for preparing the pavement surface; for application of the HFST; for removing and disposing of excess material after completion and again in 3-7 days.

The department will pay for pavement repairs, joint and crack sealing, and traffic control separately under other contract bid items or, absent the appropriate bid items, as extra work.

399. High Friction Surface Treatment Asphalt, Item SPV.0180.0104.

A Description

This special provision describes providing a High Friction Surface Treatment (HFST) composed of aggregate in an asphaltic binder on HMA pavements.

B Materials

B.1 Asphaltic Binder

Furnish polymer-modified emulsified asphalt conforming to AASHTO M 316.

B.2 Aggregates

Furnish natural aggregates, synthetic aggregates, or industrial by-products that have a proven record of performance in applications of this type. Industrial by-products shall conform to category 1 or 2 under NR 538.08 of the Wisconsin Administrative Code.

Ensure that aggregates are resistant to polishing and crushing; clean and free of surface moisture; fractured or angular in shape; free from silt, clay, asphalt, or other organic materials; compatible with the asphaltic binder; and meet the properties and gradation requirements in Tables 1 and 2.

Table 1. Aggregate Properties

Property	Requirements	Test Method
Fine Aggregate Angularity	≥ 45%	AASHTO T304, Method A
Micro-Deval	≤ 15% loss	ASTM D7428
LA Wear	<10% loss @ 100 revolutions and < 35% loss @ 500 revolutions	AASHTO T96
Freeze-Thaw Soundness	<12% loss @ 50, 16 or 25 cycles using Procedure A, B or C respectievely	AASHTO T103

Table 2. Aggregate Gradation

Sieve Size	% Passing by Weight
No. 4	100
No. 8	30-75
No. 16	0-5
No. 30	0-1

B.3 Required Properties of the High Friction Surface Treatment Asphalt
Provide a HFST with the properties shown in Table 3.

Table 3. HFST Properties

Property	Requirements	Test Method
Surface Friction (Microtexture) - British Pendulum	BPN ≥ 65	ASTM E303
Sideway Friction Force	≥ 0.7	ASTM E670
Macrotexture Depth – Sand Patch Method	≥ 1 mm	ASTM E965

B.4 Approval of High Friction Surface Treatment
A minimum of 10 business days before applying HFST, submit documentation that the materials meet the requirements of Tables 1, 2, and 3 to the engineer for approval. Documents must be dated within three years. If the engineer requests, provide samples of asphaltic binder and aggregate for department testing before applying HFST. If using industrial by-products as aggregate, submit a certificate of compliance certifying which category the material conforms to under NR 538.08 of the Wisconsin Administrative Code.

C Construction
C.1 General
Conduct a meeting before applying HFST to establish procedures for maintaining optimum working conditions and coordination of the work.

Ensure that polymer modified emulsified asphalt materials maintain their original properties during storage and handling. Store all aggregates in a dry environment and protect from contaminants on the job site.

C.2 Pavement Surface Preparation

C.2.1. Pavement Surface Repair

Remove unsound pavement as the plans show or the engineer directs.

Ensure that products used for pavement repairs or patches are compatible with the asphaltic HFST and are fully cured before placing the HFST. Do not apply HFST to new HMA pavement until after it has been in place for at least 24 hours.

C.2.2 Surface Preparation

Cover and protect utilities, drainage structures, expansion joints on bridge decks, and other structures within or adjacent to the application location to prevent materials from adhering to or entering those structures.

Remove pavement markings that are within the treatment area by one or a combination of scarification, grinding, or sand blasting. Cover existing pavement markings adjacent to the application if they are to remain in place.

Seal joints and cracks greater than 1/4 inch wide with a joint sealant conforming to ASTM D6690.

Clean the existing pavement surface with a power broom or other suitable equipment to remove dirt, clay, or other foreign material no more than 24 hours before applying HFST. Keep vehicles and unnecessary equipment off the cleaned surface. Apply HFST as soon as possible after cleaning is completed.

C.3 Application of the High Friction Surface Treatment

Do not apply the HFST if any of the following exists:

- Pavement surface is wet or not sufficiently clean.
- Ambient air temperature is below 60° F.
- Rain is predicted before HFST application will be completed.

Close treatment areas to traffic automated equipment. Adjust the application rate based on the existing pavement surface type and condition. Use a minimum application rate of 0.25 gallons per square yard. Use enough asphaltic binder to cover the pavement surface and bind the aggregate, but not so much that it covers the aggregate or bleeds in hot weather.

If applying binder with an automated sprayer, ensure that the equipment features positive displacement, volumetric metering, and is capable of storing, mixing, heating, monitoring, and distributing the binder components at the proper mix ratio. If using an automated tack distributor, provide equipment conforming to standard spec 455.3.2.2.3. Adjust the

pressure and the speed of the equipment according to the application rate, and the size, angle, and bar height of the spray nozzles.

Dry or moisten the aggregate to ensure that it is damp to surface dry. Immediately after applying the asphalt binder, while it is still brown in color and before it begins to break, distribute aggregate over the surface using a standard chip spreader or equivalent machine that can provide uniform, consistent coverage. Completely cover the treated surface but limit the application to an amount easily embedded in and bonded by the asphaltic material. Cover areas that have excessive binder with additional hand broadcasted aggregate immediately before rolling.

Roll the surface according to standard spec 475.3.5(2) immediately after placing the aggregate. Stop rolling as soon as the asphalt sets or hardens to preserve the asphalt-to- aggregate bond until after the cover aggregate is applied.

Construct HFST to the full width of the existing pavement surface or as the plans show or engineer directs. Apply as a single layer 1/8 inch to 1/4 inch thick.

Heat and apply the asphaltic material to the supplier-specified temperature using equipment conforming to standard spec 455.3.2.2.2. The department will reject overheated or otherwise damaged asphaltic material.

Apply the asphaltic binder uniformly over the pavement surface manually or with

After all the water evaporates and the emulsified asphalt is completely set, remove excess loose surface aggregate by lightly sweeping, blowing, or vacuuming. Do not tear or otherwise damage the surface. The contractor may reuse recovered aggregate if it is clean, uncontaminated and dry. Repair damaged areas or areas with excess or insufficient aggregate coverage. Clean expansion joints, utilities, and drainage structures of all debris before opening to traffic.

Additionally, within 3 to 7 days after opening to traffic, remove loosened aggregates from the high friction surface area, the shoulders, and any other areas within or immediately adjacent to the HFST site.

D Measurement

The department will measure High Friction Surface Treatment Asphalt by the square yard, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0104	High Friction Surface Treatment Asphalt	SY

Payment for High Friction Surface Treatment Asphalt is full compensation for providing the HFST; for testing materials; for preparing the pavement surface; for application of the HFST; and for removing and disposing of excess material after completion and again in 3-7 days.

The department will pay for pavement repairs, joint and crack sealing, and traffic control separately under other contract bid items or, absent the appropriate bid items, as extra work.

400. Concrete Pavement 12-Inch Special, Item SPV.0180.0105.

A Description

This special provision describes specialized material and construction requirements to utilize on the Zoo Interchange mainline pavement and shoulders.

Conform to standard specs 415 and 501 of the as modified in this special provision, and in accordance to special provision QMP Concrete Pavement Special Requirements.

Concrete pavement mixes from standard spec 501 may not be used. Provide an independent contractor developed mix design.

B Materials

B.1 Concrete

Add the following to standard spec 415.2.1

Furnish a cementitious material that does not contain more than 30% slag. Ensure that the combination of fly ash and slag does not exceed 30% of the total cementitious material.

B.2 Reinforcement

Replace standard spec 415.2.2 with the following:

Furnish steel reinforcement conforming to standard spec 505. Furnish tie bars as the plans show and according to standard spec 505.2.6.

Furnish dowel bars conforming to standard spec 505.2.6 except, for transverse joints in mainline concrete pavement, use non-corrosive high performance dowel bars. Use only one type of high performance bar for work under the contact. The following may be used:

1. Bars with 316L stainless steel cladding meeting ASTM A276 chemical requirements. Ensure that the bars have a smooth finished surface cladding 0.060 inches thick or thicker over ASTM A615 grade 60 or higher carbon steel.

2. Bars with 316L stainless steel tubes meeting ASTM A276 chemical requirements. Ensure that the tubes have a smooth finished surface, a wall thickness of 0.060 inches or more, and are press-filled with ASTM A615 grade 60 or higher carbon steel. Use an adhesive or epoxy between the tube and the carbon steel to fill any voids.

3. Solid 316L stainless steel bars conforming to ASTM A955 grade 60 or higher.

4. Bars with a rolled UNS Z41121 zinc alloy cladding conforming to ASTM B6. Ensure that the bars have a smooth finished surface cladding 0.040 inches thick or thicker over ASTM A615 grade 60 or higher carbon steel.

5. Bars with a fully bonded longitudinal glass fiber reinforced polymer (GFRP) corrosion shield conforming to the GFRP materials requirements of AASHTO LRFD Bridge Design Guide Specifications for GFRP Reinforced Concrete Bridge Decks and Traffic Railings. Ensure that the bars have a smooth finished GFRP surface coating 0.125 inches thick or thicker over ASTM A615 grade 60 or higher carbon steel.

6. Use bars with a minimum outside diameter of 1.5-inches and a length of 18-inches for all non-corrosive high performance dowel bars.

B.3 Concrete Curing Compounds
Replace standard spec 415.2.4 with the following:

Furnish poly-alpha-methylstyrene membrane curing compound conforming to ASTM C 309 as modified below.

Total Solids (% by weight of compound)	42 Minimum
% Reflectance in 72 hours (ASTM E1347)	65 Minimum
Loss of Water, kg/m2 in 24 hours (ASTM C156)	0.15 Maximum
Loss of Water, kg/m2 in 72 hours (ASTM C156)	0.40 Maximum
VOC content (g/L)	350 Maximum
Infrared Spectrum, Vehicle	100% alpha methylstyrene

B.4 Coarse Aggregates
B.4.1 General
Replace standard spec 501.2.5.4.1 with the following:

Use clean, hard, durable crushed limestone with 100% fractured surfaces and free of an excess of thin or elongated pieces, frozen lumps, vegetation, deleterious substances or adherent coatings considered injurious.

Use virgin aggregates only.

B.5 Deleterious Substances

Replace standard spec 501.2.5.4.2(1) with the following:

The amount of deleterious substances shall not exceed the following percentages:

DELETERIOUS SUBSTANCE	PERCENT BY WEIGHT
Shale	1.0
Coal	1.0
Clay lumps	0.3
Soft fragments	3.0
Any combination of above	3.0
Thin or elongated pieces based on a 3:1 ratio	15.0
Materials passing the No. 200 (75 µm) sieve	1.5
Chert[1]	3.0

[1] Material classified lithologically as chert and having a bulk specific gravity (saturated surface-dry basis) of less than 2.45. Determine the percentage of chert by dividing the weight of chert in the sample retained on a 3/8-inch (9.5 mm) sieve by the weight of the total sample.

B.6 Physical Properties

Replace standard specs 501.2.5.4.3 (1) and (2) with the following:

The percent wear shall not exceed 30%.

The department will ensure that soundness testing conforms to AASHTO T 104, using five cycles in sodium sulfate solution on aggregate retained on the No. 4 (4.75 mm) sieve. The weighted loss shall not exceed 6 percent.

The department will ensure that freeze-thaw soundness testing confirms to AASHTO T 103. The weighted freeze-thaw average loss shall not exceed 15 percent.

B.7 QMP Testing Requirement Modification

B.7.1 Concrete Pavement Mixes

Testing referred to in this section pertains to concrete mix design approval and trial batch proving.

In addition to B.5.2.3.2 paragraph one of the QMP Concrete Pavement Special Requirements provision of this contract, use at least five pairs of beams and five pairs of cylinders to demonstrate the flexural strength of a mix design. Demonstrate that the 28-day flexural strength of the proposed mix will equal or exceed 650 psi. Ensure that the average flexural strength of any one pair of beams is not less than 490 psi.

B.7.2 Contractor Testing

B.7.2.1 General

Perform all quality control tests applicable to this special provision and as described in the quality control plan. Use the test methods identified below to perform the required tests:

Flexural strength……AASHTO T 97

The department may periodically observe contractor sampling and testing, and direct additional contractor sampling and testing for department evaluation. Ensure that all test results are available for the engineer's review at any time during normal working hours.

B.7.3 Flexural Strength

B.7.3.1 Sampling

Cast specimens for testing flexural strength in each lot tested under the QMP Concrete Pavement Special Requirements provision of this contract. Cast compressive strength and flexural strength test specimens from the same concrete mix sample.

Sample according to AASHTO T 141. Cast and cure the specimens according to AASHTO T 23.

Cast one set of three standard 6 x 6 inch beams to test the lot flexural strength.

B.7.3.2 Testing

Have a technician certified for flexural strength through the department's HTCP, in a department-qualified laboratory, perform flexural strength testing and document the results.

Determine the 28-day strength in psi of each specimen according to the specified AASHTO standards for each required test. Test each specimen to failure. Use a machine that automatically records the date, time, rate of loading, and maximum load of each specimen. Include a printout of this information with the strength documentation for each specimen tested.

C Construction

C.1 Jointing

C.1.1 General

Add the following to standard spec 415.3.7.1:

Treat sawed surfaces of transverse and longitudinal joints with a silane joint sealant found on the departments approved products list for Concrete Protective Surface Treatments. Prepare surface by pressure washing all saw slurry from sawed joints and allow to dry thoroughly prior to application of silane sealer. Apply the product directly to the interior of the sawed joint. Do not use the broadcast spray method of application.

C.2 Surface Finishing
Replace standard spec 415.3.8.3.1 with the following:

Tine freshly placed pavement as soon as it is practical after floating.

Tine with a self-propelled tining machine. Where using a tining machine is not practical, tine by hand. Produce uniformly deep grooves approximately 1/8 to 3/16 inch (3 mm to 5 mm) deep. Provide a finished surface free of tining defects. Complete before tining tears or unduly roughens the concrete.

Tine surface longitudinally as specified in standard spec 415.3.8.3.2.

C.3 Curing Concrete
C.3.1 General
Replace standard spec 415.3.12.1 with the following:

Maintain adequate moisture throughout the concrete mass to support hydration until the concrete develops sufficient strength to open it to service. Cure all concrete by impervious coating as specified in standard spec 415.3.12.2 within 75 minutes from the time concrete is discharged from the truck.

If the concrete is not cured as specified in the subsection, the engineer may suspend concrete placement operations.

C.4 Extended Delivery Time
Delete paragraph one from standard spec 501.3.2.4.3.3.

C.5 Ready-Mixed Concrete
C.5.1 General
Replace standard spec 501.3.5.1 with the following:

Use central-mixed concrete for all work under this special provision. Central-mixed concrete is completely mixed in a stationary mixer and transported to the point of delivery with or without mechanical agitation in the transporting vehicle.

C.6 Hot Weather Concreting
C.6.1 General
Replace standard spec 501.3.8.2.1 with the following:

Take the following steps to ensure that the concrete will cure during hot weather conditions. Submit a written temperature control plan at or before the pre-pour meeting. In that plan, outline the actions to control concrete temperature if the concrete temperature at the point of placement exceeds 80° F (27° C). Do not place concrete without the engineer's written acceptance of that temperature control plan. Perform the work as outlined in the temperature control plan.

If the air temperature exceeds 80° F (27° C) ensure that the asphalt base is in a moist condition during concrete placement. Water the asphalt base, as required, not less than six hours before placing the concrete. If the asphalt base subsequently dries, moisten it by sprinkling water just before placing the concrete. Sprinkle the water to avoid forming pools.

If the concrete temperature at the point of placement exceeds 90° F (32° C), do not place concrete for items covered in this special provision.

Notify the engineer whenever conditions exist that might cause the temperature at the point of placement to exceed 80° F (27° C). If project information is not available, obtain information from similar mixes placed for other nearby work.

Any additive or action taken to control the temperature of concrete to within the limits of this special provision, including but not limited to the addition of ice to the concrete mix, is considered incidental to the work and will not be measured or paid for separately.

D Measurement
The department will measure Concrete Pavement 12-Inch Special by the square yard, acceptably completed.

E Payment
Conform to standard spec 415.5 and as modified in this special provision.

Replace paragraph one of standard spec 415.5.1 with the following:.

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0105	Concrete Pavement 12-Inch Special	SY

E.1 Pay Adjustment for Compressive Strength
The department will adjust pay for each lot using percent within limits (PWL) of the 28-day sublot average strengths for that lot. The department will measure PWL relative to the lower specification limit of 4500 psi.
SEF Rev. 13_1210

401. Asphaltic Material Binder, Item SPV.0180.0106.

A Description
Furnish and apply an asphaltic material binder to aggregate, at locations shown in the plans, to control erosion and prevent the growth of vegetation.

B Materials

B.1 General

Furnish emulsified asphalt, type RS 1 or RS 2 conforming to AASHTO M140, or type CRS 1 or CRS 2 conforming to AASHTO M208 for the asphaltic material.

Furnish evidence, to the satisfaction of the engineer, that the proposed product has been successfully used in a similar application.

C Construction

C.1 Application

Apply the binder uniformly over the surface at a rate sufficient to ensure penetration and binding of the particles in the upper 2 inches of the aggregate blanket. Avoid excessive application of asphaltic material and exercise care to prevent material run-off. Protect the surface of adjacent structures, barriers, and pavement to prevent splattering or discoloration by asphaltic material.

Protect asphaltic material binder from excessive dust exposure for the first 4 hours of curing.

C.2 Test Section

Prepare a test section utilizing aggregate and asphaltic material binder so the engineer will be able to assess the adequacy of the product and the application to yield the desired results. Test section to be a minimum of 3-feet x 3-feet. Notify the engineer no less than 24 hours in advance of preparing the test section to allow him time to arrange for witnessing the asphaltic material binder application and mixing with the aggregate. Test section shall be allowed to cure before the engineer will accept the product for use.

If the test section is not accepted, prepare another test section and repeat the process. Repeat this procedure until the engineer accepts the test section. Use the same asphaltic material binder means and methods when installing the product that were used in preparing the accepted test section.

D Measurement

The department will measure Asphaltic Material Binder by the square yard in place, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0106	Asphaltic Material Binder	SY

Payment is full compensation for furnishing and applying the asphaltic material binder to the aggregate; for cleaning any splatter of asphaltic material binder from adjacent structures, barriers, and pavement; for making and disposing of test sections.

402. Epoxy Resin Binder, Item SPV.0180.0107.

A Description

Furnish and apply an epoxy resin binder to aggregate, at locations shown in the plans, to control erosion and prevent the growth of vegetation.

B Materials

B.1 General

The epoxy resin binder shall be a low modulus, medium-viscosity, two-component epoxy resin.

Furnish evidence, to the satisfaction of the engineer, that the proposed product has been successfully used in a similar application.

Epoxy resin binder shall be clear to light amber when fully cured.

B.2 Minimum Requirements

The epoxy resin binder shall conform to ASTM C-881 and AASHTO M-235 specifications and the following requirements:

- Total water absorption, ASTM D-570
  7 day, 1.3% (2 hour boil)
  14 day, 0.232% (24 hour immersion)
  Viscosity: 2,500 cps

C Construction

C.1 Application

In accordance to the manufacturer's directions, uniformly apply the epoxy resin binder over the surface at a rate sufficient to assure penetration and binding of the particles in the upper 2 inches of the aggregate blanket. Avoid excessive application of binder and exercise care to prevent material run-off. Protect the surface of adjacent structures, barriers, and pavement to prevent splattering or discoloration. Application of the binder shall take place utilizing a two part sprayer with mixing completed at the nozzle.

Apply and mix epoxy resin binder under dry conditions only. Do not apply if rain is expected within 8 hours following epoxy resin application to crushed aggregate.

Air and surface temperature should be between 50 and 90 degrees Fahrenheit during and for 24 hours following application and mixing of the epoxy resin binder.

Protect installed epoxy resin binder from excessive dust exposure for the first 4 hours of curing.

C.2 Test Section

Prepare a test section utilizing aggregate and epoxy resin binder so the engineer will be able to assess the adequacy of the product and the application and mixing methods to yield the desired results. Test section to be a minimum of 3-feet x 3-feet. Notify the engineer no

less than 24 hours in advance of preparing the test section to allow him time to arrange for witnessing the epoxy resin binder application and mixing with the aggregate. Test section shall be allowed to cure according to product manufacturer's requirements before the engineer will accept the product for use.

If the test section is not accepted, prepare another test section and repeat the process, using a different epoxy resin binder. Repeat this procedure until the engineer accepts the test section. Use the same epoxy resin binder means and methods when installing the product that were used in preparing the accepted test section.

D Measurement

The department will measure Epoxy Resin Binder by the square yard in place, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0107	Epoxy Resin Binder	SY

Payment is full compensation for furnishing, mixing and applying the epoxy resin binder to the aggregate; for cleaning any splatter of epoxy resin binder from adjacent structures, barriers, and pavement; and for making and disposing of test sections.

403. Topsoil Special, Item SPV.0180.0200.

A Description

This special provision section describes furnishing, placing, spreading, and finishing humus-bearing soil, adapted to sustain plant life, commonly known as topsoil, from locations the contractor furnishes beyond the limits of the right-of-way.

This special provision also describes removing topsoil from the sites of proposed roadway excavations and embankments in amounts and depths available and necessary to cover the work slopes. This work also includes reclamation, placing, spreading, and finishing of this topsoil.

B Materials

Furnish material that is relatively free from large roots, sticks, weeds, brush, stones, litter, and waste products.

Furnish material, either obtained offsite, or material obtained within project limits, consisting of loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing soils adapted to sustain plant life. Do not use surface soils from ditch bottoms, drained ponds, and eroded areas, or soils which are supporting growth of NR 40 listed plants and noxious weeds or other undesirable vegetation. Ensure that the material conforms to the following:

Topsoil Requirements	Minimum Range	Maximum Range
Material Passing 2.00 mm (#10) Sieve*	90%	100%
PH Range	6.0	7.0
Organic Matter**	5%	20%
Clay	5%	30%
Silt	10%	70%
Sand and Gravel	10%	70%

*See Section 625.3.3 of the Standard Specifications for sieve requirements when using either sod or seed mixture 40.

**Organic matter determined by loss on ignition test of samples oven dried to constant weight at 212 F (100 C).

C Construction

C.1 Preparing the Roadway for Topsoil

Undercut or underfill all areas designated to receive topsoil to a degree that if covered to the required depth with topsoil the finished work conforms to the required lines, grades, slopes and cross sections the plans and drawings show.

C.2 Processing Topsoil

Mow topsoil procurement areas to a height of approximately 6 inches. Remove litter such as brush, rock, and other materials that will interfere with subsequent vegetation establishment.

Strip off the humus-bearing soil. Take care to minimize removing the underlying sterile soil. Then stockpile the topsoil on the right-of-way or place it directly on the designated areas.

Obtain topsoil from embankment areas outside the roadway foundation only if that additional material is required to cover the slopes, and conforms to the requirements of section B above. Utilize excess topsoil on the project or dispose of as specified in standard spec 205.3.12.

C.3 Placing Topsoil

After preparing and finishing the areas designated for topsoil to the required lines, grades, slopes and cross section, place and spread the topsoil to a uniform depth as the plans show or the contract requires. If no depth is shown, place and spread the topsoil to a minimum depth of 4 inches in rural areas and a minimum depth of 6 inches in urban areas, or as the engineer designates.

Break down all clods and lumps using appropriate equipment to provide a uniformly textured soil.

Where using either sod or seed mixture 40 ensure that, for the upper 2 inches, 100 percent of the material passes a one-inch sieve and at least 90 percent passes the No. 10 sieve.

Remove rocks, twigs, foreign material, and clods that cannot be broken down. Dress the entire surface to present a uniform appearance. The engineer will not require rolling.

If light sandy soils are covered with heavier clay bearing loam topsoil, then mix or blend the two types of soils to a more or less homogeneous mixture by using the appropriate equipment.

D Measurement

The department will measure Topsoil acceptably completed by the square yard. The measured quantity shall equal the actual number of square yards of topsoiled area to the depth specified within the limits of construction designated on the plans, or in the contract, or as the engineer directs.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0200	Topsoil Special	SY

Payment for Topsoil is full compensation for removing, stockpiling, reclaiming, providing, processing, excavating, loading, hauling, and placing this material; and for undercutting excavations, or underfilling embankments necessary to receive this material. The department will make no allowance, adjustment, or measurement for payment under the Excavation bid items for undercutting cut sections, underfilling embankments, or deductions for materials obtained from areas of cut sections.

If an area is damaged by erosion after partial acceptance, the department will pay for restoring topsoil in these areas at a unit price determined by multiplying the contract unit price bid for Topsoil multiplied by 3. The department will pay for restoration under the Restoration Post Acceptance Topsoil administrative item.

The department will not pay for removing topsoil from outside the roadway foundation in embankment areas unless that material is necessary to cover the slopes.
SEF Rev.13_0626

404. Geogrid Reinforcement, Item SPV.0180.0800.

A Description

This special provision describes furnishing and installing geogrids for subgrade stabilization, base reinforcement, or pavement structure applications in accordance to the plans, standard spec 645, and as hereinafter provided.

B Materials

Provide geogrid that consists of either single or joined multiple layers of a uniform rectangular grid of bonded, formed, or fused polymer tensile strands crossing with a nominal right angle orientation. The polymer shall consist of polyester, polypropylene, polyamide, or polyethylene. The grid shall maintain dimensional stability during handling, placing, and installation. The geogrid shall be insect, rodent, mildew, and rot resistant. Minimum geogrid width shall be 6.0 feet.

Provide geogrid that complies with the following physical properties:

Test	Method	Value [1]
Tensile Strength at 5% Strain, Both Principal Directions (lb/ft)	ASTM D 4595 [2]	450 min.
Flexural Rigidity Both Principal Directions (mg-cm)	ASTM D 1388 [3]	150,000 min.
Aperture Area (in^2)	Inside Measurement [4]	5.0 max
Aperture Dimension (in)	Inside Measurement [4]	0.5 min.

[1] All numerical values represent minimum/maximum average roll values, i.e. the average minimum test results on any roll in a lot should meet or exceed the minimum specified value.

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[2] The tensile strength (T) of a joined multi-layered geogrid shall be computed using the following equation:

$$T = n(f)t$$

where

n = the number of individual layers in the joined multi-layered geogrid,

t = the tensile strength of a single layer of geogrid as determined using testing method ASTM D4595, and

f = reduction factor based on the number of layers comprising the multi-layered system and determined by the equation f=1.00 - [0.04(n - 1)].

(3) Values shall be determined by Option "A" (Cantilever Test) of testing method ASTM D1388 using test specimens that are 36 inches ±0.04 inch long. Test specimen widths for differing geogrids shall be variable and equal to one element plus ½ the aperture width on both sides of that element. An element is defined as the minimum number of parallel strands that form a distinguishable repeating pattern.

(4) Aperture Area and Aperture Dimension for joined multi-layer geogrids shall be determined based on measurement of a single layer of the geogrid.

Protect the geogrid from ultraviolet radiation and from damage due to shipping and handling. Keep the geogrid dry until it is installed. The geogrid rolls shall be clearly marked to identify the material contained.

Deliver a sample of the geogrid material to the engineer at least ten days prior to its incorporation into the work. At the same time, furnish a manufacturer's Certified Report of Test or Analysis that verifies that the geogrid delivered for use on the work meets the above requirements. Samples of geogrid for test purposes will be obtained from the job site for each 10,000 square yards or portions thereof used on the contract.

C Construction

Prior to placement of the geogrid, bring the indicated placement surface to the required lines, grades, and dimensions as shown on the plans. Smooth and shape the surface to eliminate any rocks, clods, roots, or other items that may cause damage to the geogrid during placement or covering.

Place the geogrid on the prepared surface at the locations and to the limits as shown on the plans. After placement, pull the geogrid taut and secure it using pins, clips, staples, or other devices to prevent movement or displacement. Place parallel strips of geogrid with a minimum overlap of 24 inches. Lap butt joints between roll ends a minimum of 12 inches. Fasten all lapped sections together by using ties, straps, clips, or other devices to develop a secure joint that meets the approval of the engineer. No vehicles or construction equipment shall be permitted to operate directly on the geogrid.

Cover small rips, tears, or defects in the geogrid with an additional section of geogrid; secure the additional geogrid in place so that it overlaps the damaged area by at least 3 feet in all directions. Remove and replace geogrid sections with large rips, tears, defects, or other damage at the direction of the engineer. Take responsibility for all costs to repair or replace damaged or defective geogrid.

After placement, cover the geogrid to the indicated depth with the type of material required on the plans or in the special provisions. Placing, spreading, and compacting of this material shall comply with the applicable sections of the standard specifications or special provisions except that the initial lift of material placed on the geogrid must be at least 4 inches. Place, spread, and compact the required backfill material so that the geogrid

is not displaced or damaged. The engineer may require changes in equipment and/or operations to prevent such damage or displacement.

D Measurement
The department will measure Geogrid Reinforcement by the square yard of surface area, upon which the geogrid has been placed, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0800	Geogrid Reinforcement	SY

Payment is full compensation for furnishing, transporting, and installing the geogrid; furnishing and installing all devices and materials necessary to join or secure the geogrid in place.
SEF Rev. 12_1004

405. Soil Drying SPV.0180.0801; Soil Drying Agent SPV.0195.0801.

A Description
Use a soil drying agent only when directed by the engineer and weather conditions are not conducive to using discing, natural sunlight and wind to dry the soil to within an acceptable range of soil moisture content for efficient compaction per the QMP Subgrade special provision. The drying agent will be used principally in the late fall, winter and early spring when drying weather is not normally available. Soil should be dried per this specification when the moisture content is greater than the specified percent above the soil optimum moisture content and discing and air drying are not effective in reducing the soil moisture content. The contractor cannot use a soil drying agent until the engineer determines that soil moisture content, project schedule and weather require that the agent be used. Drying agents will only be used to facilitate soil compaction after the approval and authorization of the engineer.

The drying agent to be used for the project will be Fly Ash. Other drying agents such as hydrated lime, lime kiln dust and cement kiln dust are not allowed to be used as drying agents.

Drying agents will not be considered as part of a Cost Reduction Incentive (CRI) and will have to meet the general requirements of this special provision. The fly ash is used in absorption and chemical binding of moisture to facilitate compaction. The intent of this specification is to dry the soil and not to increase the strength of the soil-fly ash mixture.

Fly ash can be used to dry most soils but the expectation is that it will be used for predominantly cohesive (clay - CL) and silty (ML and SM) soil. Clean sand and gravel will not benefit by addition of fly ash and therefore should not be dried using fly ash. The fly ash must be thoroughly mixed with the soil as fill lifts are placed to dry the soil and meet the compaction requirements.

B Materials

Fly ash is a finely divided residue resulting from combustion of coal in an electric generating plant, transported from the boiler by flue gases and later collected by precipitators. The soil drying agent must consist of Class C fly ash according to ASTM C618. The fly ash shall conform to the general requirements of standard spec 501.2

C Construction

C.1 Submittals

C.1.1 General

Prepare and submit soil drying agent mix and work plan at least 10 calendar days prior to beginning drying agent activities. A minimum dosage of 40 pounds of fly ash per square yard to an 8-inch depth/lift by the dry weight of the soil must be used. WisDOT will accept the submittal as submitted or return the submittal with requested revisions. Do not start any drying agent work until WisDOT provides acceptance of soil drying agent mix and work plan. Acceptance of the submittals does not relieve the contractor of responsibility for successful completion of the earthwork.

C.1.2 Submittals for Approval

Soil Drying Agent Mix:

a. Submit mix designs for the drying agent proposed for use. A mix design is required for each soil type and dosage rate. Resubmit as appropriate if the mixes are modified during the course of the work including fly ash source changes. The mix design must indicate the optimum amount of fly ash needed as a percentage of the soil dry weight for the soil to be dried. Each mix design shall show the ingredients of the mix and shall include:
    i. Type, source, and amounts of fly ash, and other additives.
    ii. Material Safety Data Sheet (MSDS) for the fly ash (provide once per fly ash source).
    iii. Source and amount of additional water, as needed.
    iv. Representative samples of soil and ash materials for materials test and mix proportion testing (provide once per soil type and fly ash source).
    v. Combined grading of each mix design.
    vi. Specific gravity of all materials.
    vii. Atterberg Limits tests (ASTM D-4318) for the soil and soil fly ash mixture.
    viii. Standard Proctor tests (ASTM D-698) on the soil and soil fly ash mixture.
    ix. Tests showing soil moisture loss with the proposed dosage rate.
    x. Results of required tests.
b. Submit certificates of compliance for each load of fly ash which is in accordance to ASTM C618 and certificates of compliance for all admixtures. Supporting test data shall be furnished when requested by WisDOT. All testing and sampling procedures shall be in accordance to ASTM C311.

Soil Drying Agent Work Plan: The work plan for placing the soil drying agent shall include:

a. Drying agent placement methods, mixing procedures and sequences for soil drying.
b. Method of transporting and distributing fly ash into the soil including rotary mixer equipment and materials.
c. Means for measuring fly ash per fill area. Use of truck tickets that specify net weight of fly ash in a truck is acceptable.
d. Embankments to be treated, natural moisture contents of the cut to fill soils, and proposed dosage rates.

Submit a revised work plan reflecting any changes made during the course of the work. Do not continue with Soil Drying Agent work until the revised work plan is approved by the engineer.

C.1.3 Information Submittals

Soil Drying Agent Daily Records: Submit the following daily reports and records for soil drying agent.

a. Daily logs of drying agent placement operations at all locations (station and position) of embankment fill placement, including fly ash volumes, mix details and weather conditions.
b. Additional lab testing as identified in section C.1.2.a is expected to be required if the soil to be dried changes engineering characteristics. Supplemental test reports from a certified testing laboratory are required when the fill soil changes.

C.1.4 Acceptance

The department will evaluate the Submittals for Approval with the requirements of these special provisions. Within 5 calendar days after receipt of the Submittals of Approval, WisDOT will notify the contractor of the acceptance of the submittal, or if additional information and/or changes are required. Any unacceptable part of the Submittals of Approval will require resubmission. The contractor must resubmit the Submittals of Approval for evaluation and review with the necessary changes or additional information provided. WisDOT will provide a written notice of acceptance or rejection of contractor's resubmitted Submittal for Approval within 5 calendar days after its receipt.

After WisDOT's acceptance of Submittal of Approval, no changes to the Submittal of Approval can be made without written consent of WisDOT.

All Information Submittals should be submitted to WisDOT. WisDOT can reject the submittals which do not provide adequate detail, as required herein. The contractor shall resubmit the rejected submittals within 7 days upon the receipt of WisDOT's rejection notice.

C.2 General Soil Drying Requirement
Notify WisDOT at least 24 hours in advance of the start of soil drying operations. Soil drying cannot be used on frozen soil or with frozen fly ash. Compaction must be started no later than 1 to 2 hours after the fly ash is mixed with the soil.

Soil drying agent must be thoroughly mixed into each lift of wet soil using a rotary mixer to be sure that the fly ash is uniformly distributed and uniformly dries the soil to acceptable moisture content for compaction.

Soil drying can be performed in colder weather as long as the soil and fly ash is not frozen. If fill placement must occur during freezing conditions, soil drying can be used but any soil/fly ash mixture that freezes must be removed including materials that freeze overnight. The removal must extend to an unfrozen subgrade and the frozen material must be replaced with non-frozen soil or soil/fly ash.

C.3 Cleanup
Care must be exercised by the contractor to prevent fugitive dust containing fly ash while mixing and placing the ash. Minimize spilling and do not allow blowing of fly ash on areas that do not need to be dried. Remove or mix any spilled ash with soil to prevent ash from becoming air born. Properly dispose or all waste materials.

D Measurement
The department will measure Soil Drying in area by the square yard per lift of the soil, effectively dried and acceptably completed.

The department will measure Soil Drying Agent per ton, acceptably completed, using truck weigh tickets.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.0801	Soil Drying	SY
SPV.0195.0801	Soil Drying Agent	TON

Payment for Soil Drying is full compensation for preparing submittals, soil testing, maintaining daily records, and mixing drying agent with wet soil for compaction, including all necessary equipment, water and disposal of surplus materials. Compaction of fill is paid for under other specifications and not included herein.

Payment for Soil Drying Agent is full compensation for providing, hauling and spreading the drying agent.

No additional payment will be provided for Soil Drying when used in previously placed embankment areas that have been removed as a result of frost or poor drainage.

406. Slope Paving Crushed Aggregate Special Item SPV.180.4800.

A Description

Furnish, crush and place aggregate for slope paving and apply an epoxy resin binder with the aggregate, as shown in the plans, in accordance to the applicable provisions of standard spec 604, and as hereinafter provided.

B Materials

B.1 General

The epoxy resin binder shall be a low modulus, medium-viscosity, two-component epoxy resin.

Furnish evidence, to the satisfaction of the engineer, that the proposed product has been successfully used in a similar application.

Epoxy resin binder shall be clear to light amber when fully cured.

Crushed aggregate shall be native Wisconsin limestone with hues of tan, amber and gray. Crushed aggregate shall have 100% fractured faces.

Crushed aggregate shall conform to the following nominal requirements:

Sieve Size	Percent by Weight Passing
4-Inch	100
1-Inch	0-25

B.2 Minimum Requirements.

The epoxy resin binder shall conform to ASTM C-881 and AASHTO M-235 specifications and the following requirements:

Total water absorption, ASTM D-570

7 day, 1.3% (2 hour boil)

14 day, 0.232% (24 hour immersion)

Viscosity: 2,500 cps

C Construction

C.1 Application

The binder shall be applied in accordance to the manufacturer's directions, uniformly over the surface of the paving at a rate sufficient to assure penetration and binding of the particles in the upper 2 inches of the aggregate blanket. Application of the binder shall take place utilizing a two part sprayer with mixing completed at the nozzle.

Apply and mix epoxy resin binder under dry conditions only. Do not apply if rain is expected within 8 hours following epoxy resin application to crushed aggregate.

Air and surface temperature should be between 50 and 90 degrees Fahrenheit during and for 24 hours following application and mixing of the epoxy resin binder.

Protect installed crushed aggregate with epoxy resin binder from excessive dust exposure for the first 4 hours of curing.

C.2 Test Section

Prior to placing slope paving, prepare a test section utilizing the proposed aggregate and epoxy resin binder so the engineer will be able to assess the adequacy of the product and the application and mixing methods to yield the desired results. Test section to be 3-feet x 3-feet and a minimum of 4-inches thick. Notify the engineer no less than 24 hours in advance of preparing the test section to allow him time to arrange for witnessing the epoxy resin binder application and mixing with the aggregate. Test section shall be allowed to cure according to product manufacturer's requirements before the engineer will accept the product for use on the final structures.

If the test section is not accepted, prepare another test section and repeat the process, using either a different aggregate or epoxy resin binder. Repeat this procedure until the engineer accepts the test section. Use the same aggregate and epoxy resin binder means and methods when installing the product under each structure that were used in preparing the accepted test section.

D Measurement

The department will not measure Slope Paving Crushed Aggregate Special. The department will use pay plan quantity according to the Pay Plan Quantity article.

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.180.4800	Slope Paving Crushed Aggregate Special	SY

Payment is full compensation for furnishing, crushing and placing crushed aggregate; for furnishing, mixing and applying the epoxy resin binder to the aggregate; for preparing the subsurface; for cleaning any splatter of epoxy resin binder to adjacent pavement or structures; and for making and disposing of the test section.

SEF Rev. 12_1015

407. Cold Patch, Item SPV.0195.0100.

A Description

This special provision describes furnishing, stockpiling, placing, and maintaining cold patch material. Use the cold patch material for short term maintenance purposes to fill potholes/voids in the existing pavement surface that the engineer deems necessary.

B Materials

B.1 General

Furnish cold patch that is a combination of course aggregate, natural sand and bituminous material MC-250. Design the mixture to have: a workability range of 15-100º F without the addition of heat, good adhesion to wet surfaces, and resistance to damage by water, salt and deicing products. Design a uniform mixture that does not require any mixing or special handling prior to use.

B.2 Gradations

Conform to the following gradation requirements:

SIEVE SIZE	PERCENT PASSING (by weight)
3/8 Inch (9.5mm)	96 - 100
No. 4 (4.75 mm)	76 - 82
No. 8 (2.38mm)	50 - 60
No. 50 (.297mm)	15 - 20
No. 200 (.074mm)	2 - 5
Bitumen	4.8 - 5.2

C Construction

C.1 General

Choose a smooth, firm, and well-drained area for an on-site stockpile that is cleared of vegetation and foreign material that may contaminate the cold patch. Make the stockpile easily accessible, maintainable and replenishable at any time during the project. The stockpile is not to exceed 10 tons on site at any given time unless approved by the engineer. Remove and dispose of any unused portions of the stockpile at the completion of the project unless otherwise directed by the engineer. Complete this work at no additional expense to the department.

Application of the cold patch must be able to be accomplished by hand labor. Remove all ponded water and loose debris prior to filling any potholes/voids. Place material into the pothole/void and compact flush with a tamper, roller, or vehicle tire. Traffic must be able to travel over the patch immediately after installation.

D Measurement

The department will measure Cold Patch by the ton stockpiled on site, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0195.0100	Cold Patch	Ton

Payment for cold patch is full compensation for the patch; furnishing and providing a stockpile of material; preparing the pothole/void for material placement, stockpiling, placing, compacting, and maintenance. Payment includes compensation for any unused stockpile quantities remaining on site at the completion of the project.
SEF Rev. 13_0814

408. Asphaltic Pavement Repair Special, Item SPV.0195.0101.

A Description

This special provision describes the excavating, grading, compacting, and finishing necessary to accommodate Asphaltic Pavement Repair Special as shown on the plans and in accordance to the pertinent requirements of the standard specifications, and as hereinafter provided.

B Materials

Replace standard spec 460.2.8 with the following.

Submit a mix design under the Asphaltic Pavement Repair Special bid item. Furnish an asphaltic mixture meeting the requirements specified for either type E-3 or E-10 under standard spec 460.2.

Provide asphaltic material PG 64-22 for this mix in accordance to standard spec 455.

Provide tack coat that is in accordance to standard spec 455.2.5.

C Construction

Conform to standard spec 315.3.1.

Backfill all subgrade voids beneath the repair area using compacted Base Aggregate Dense. Upon approval of the engineer, backfill voids that cannot be compacted with standard equipment with Backfill Controlled Low Strength.

Adjust and reset any castings for all drainage structures within the repair area prior to the placement of Asphaltic Pavement.

D Measurement

The department will measure Asphaltic Pavement Repair Special by the ton, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0195.0101	Asphaltic Pavement Repair Special	Ton

Payment for the Asphaltic Pavement Repair Special item is full compensation for sawing joints, sawing existing pavement, for removing and disposing of existing pavements and excavated materials, preparing the foundation, adjusting castings, placing tack coat, providing and placing the asphaltic mixture (including asphaltic material), The department will pay for individual repairs the width of the existing lane or shoulder and less than 100 feet long as Asphaltic Pavement Repair Special.

The department will pay for Base Aggregate Dense and/or Backfill Controlled Low Strength separately under the respective bid items.
SEF Rev. 13_0613

409. Management of Petroleum Contaminated Soil and Solid Waste, Item SPV.0195.0700.

A General

A.1 Description

This work will conform with the requirements of Section 205 of the Standard Specifications; to pertinent parts of the Wisconsin Administrative Code, Chapters NR 700-736 Environmental Investigation and Remediation of Environmental Contamination; Wisconsin Administration Code, Chapters NR 500-538, Solid Waste; and as shown on the plans and as supplemented herein.

Petroleum-contaminated soil and historic fill containing solid waste will be encountered within the construction limits. The solid waste contains NR 500 non-exempt industrial wastes including soil mixed with foundry sand and slag. Impacted waste material excavated during construction which cannot in the opinion of the environmental consultant be managed as common excavation or reused on-site will be managed as solid waste.

This work consists of excavating, segregating, temporary stockpiling, loading, hauling, and disposing of petroleum-contaminated soil and solid waste material at a WDNR-approved disposal facility. The nearest WDNR-approved disposal facilities are:

Waste Management Orchard Ridge Landfill
N96W13503 County Line Road
Menomonee Falls, WI 53051
Phone (262) 253-8620

Advanced Disposal Emerald Park Landfill, LLC
W124 S10629 S 124th St
Muskego, WI 53150
Phone (414) 529-1360

Provide information to the environmental consultant and engineer that indicates the WDNR-approved disposal facility that the contractor will use.

A.2 Notice to the Contractor – Petroleum Contaminated Soil and Groundwater and Solid Waste Locations

The department and others completed hazardous materials assessment for locations within this project where excavation is required. Investigation for soil and/or groundwater contamination was conducted at select locations. Results indicate that petroleum-contaminated soil and groundwater and/or solid waste is present at the following locations as shown on the plans:

USH 45/IH 894 Station 320NS+50 to 322NS+00, Ramp NSC Station 19NSC+50 to 21NSC+00, and Ramp BB Station 821BB+15 to 822BB+65 from 75 feet left to 45 feet right of Ramp BB reference line (southeast quadrant of W. Bluemound Road and USH 45) from approximately 5 to 19 feet bgs. Soil is contaminated with petroleum compounds and groundwater is contaminated with benzene, arsenic, and lead. Approximately 8021 cubic yards (approximately 13,636 tons at an estimated 1.7 tons per cubic yard) of petroleum-contaminated soil will be excavated from this area.

Ramp WSA Station 14WSA+10 to 16WSA+09, from 20 feet right to 230 feet right of Ramp WSA reference line (southwest quadrant of the Zoo Interchange – Borrow Site #8) from 0 to 8.5 feet bgs. Soil is contaminated with foundry waste in a layer ranging in thickness from approximately 1 inch to 3 feet. Approximately 180 cubic yards (approximately 307 tons at an estimated 1.7 tons per cubic yard) of petroleum-contaminated soil will be excavated from this area. It should be noted that an area inside of this location, which is beyond the construction limits for Phase 1, has TCLP (toxicity characteristic leaching procedure) – hazardous waste cadmium within the foundry waste interval. The contractor should control excavation activities at the location described above during Phase 1 so as not to disturb the area with the TCLP-hazardous waste cadmium. The foundry waste containing the TCLP-hazardous waste cadmium will be excavated during Phase 2 of the Zoo Core project and hauled out of state for disposal.

Directly load petroleum-contaminated soil and solid waste excavated by the project at the above locations into trucks that will transport the material to a WDNR-licensed landfill facility for landfill disposal.

If obviously contaminated soils or other signs of NR 500 non-exempt solid waste and hazardous materials are unexpectedly encountered elsewhere on the project, terminate excavation activities in the area and notify the engineer. Examples of these unexpected conditions may include, but are not limited to, buried containers or tanks, noxious odors and fumes, stained soils, sheen on ground water, other industrial wastes, and significant volumes of municipal or domestic garbage.

No active groundwater monitoring wells were observed within the construction limits. If active groundwater monitoring wells are encountered during construction, notify the engineer and protect them to maintain their integrity. The environmental consultant will determine if monitoring wells need to be maintained. For monitoring wells that do need to be maintained, adjust the wells that do not conflict with structures or curb and gutter to be

flush with the final grade. For wells that conflict with the previously mentioned items or if monitoring wells are not required to be maintained, they will be abandoned by others.

A.3 Excavation Management Plan Approval

The excavation management plan for this project has been designed to minimize the off-site disposal of contaminated waste. The excavation management plan, including these special provisions, has been developed in cooperation with the WDNR. The WDNR concurrence letter is on file at the Wisconsin Department of Transportation. For further information regarding previous investigation and remediation activities in these areas contact:

Name:	Michael Cape, P.G.
Address:	141 NW Barstow Street, Waukesha, WI 53187-0798
Phone:	(262) 548-5930
Fax:	(262) 548-6891
E-mail:	michael.cape@dot.state.wi.us

A.4 Coordination

Coordinate work under this contract with the environment consultant:

Consultant:	TRC Environmental Corporation
Address:	150 N. Patrick Blvd. Ste. 180, Brookfield, WI 53045
Contact:	Bryan Bergmann, P.G. or Tyler Stapel, P.E.
Phone:	(262) 879-1212
Fax:	(262) 879-1220
E-mail:	bbergmann@trcsolutions.com wstapel@trcsolutions.com

The role of the environmental consultant will be limited to:

1. Determining the location and limits of petroleum-contaminated soil and solid waste to be excavated based on soil analytical results from previous investigations, visual observations, and field screening of soil that is excavated;

2. Identifying soils to be hauled to the landfill facility;

3. Documenting that activities associated with management of petroleum-contaminated soil and solid waste are in conformance with the solid waste management methods for this project as specified herein; and
4. Obtaining the necessary approvals for disposal of petroleum-contaminated soil and solid waste from the landfill facility.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all excavation activities in the area of petroleum-contaminated soil and solid waste fill described in A.2 to the environmental consultant. Identify the WDNR licensed landfill facility that will be used for disposal of petroleum-contaminated soil and solid waste, and provide this information to the environmental consultant no later than 15 calendar days

prior to commencement of excavation in the impacted area or at the preconstruction conference, whichever comes first. The environmental consultant will be responsible for obtaining the necessary approvals from the landfill facility for disposal of the petroleum-contaminated soil and solid waste.

Coordinate with the environmental consultant to ensure that the environmental consultant is present during excavation in the impacted areas. Notify the environmental consultant at least three calendar days prior to commencement of excavation in the impacted areas. Perform excavation in the impacted areas on a continuous basis until excavation work is completed. Do not transport petroleum-contaminated soil or soil containing solid waste offsite without prior approval from the environmental consultant.

A.4 Health and Safety Requirements
Supplement standard spec 107.1 with the following:

During excavation activities, expect to encounter petroleum-contaminated soil and historic fill contaminated with industrial wastes (foundry sand and slag) and associated regulated metals and organic compounds. Site workers taking part in activities that will result in the reasonable probability of exposure to safety and health hazards associated with hazardous materials shall have completed health and safety training that meets the Occupational Safety and Health Administration (OSHA) requirements for Hazardous Waste Operations and Emergency Response (HAZWOPER), as provided in 29 CFR 1910.120.

Prepare a site-specific Health and Safety Plan, and develop, delineate and enforce the health and safety exclusion zones for each impacted area as required by 29 CFR 1910.120. Submit the site-specific health and safety plan and written documentation of up-to-date OSHA training to the engineer prior to the start of work.

B (Vacant)

C Construction
Supplement standard spec 205.3 with the following:

Control operations in the impacted areas to minimize the quantity of soil excavated.

The environmental consultant will periodically monitor soil excavated from the areas identified in A.2 above. The environmental consultant will evaluate excavated soil based on field screening results, visual observations, and soil analytical results from previous environmental investigations. Assist the environmental consultant in collecting soil samples for evaluation using excavation equipment. The sampling frequency shall be a maximum of one sample for every 20 cubic yards excavated.

Directly load and haul petroleum-contaminated soil and solid waste designated by the environmental consultant for offsite disposal to the WDNR approved landfill facility. Use loading and hauling practices that are appropriate to prevent any spills or releases of the

material. Prior to transport, sufficiently dewater soils designated for off-site disposal so as not to contain free liquids.

Verify that the vehicles used to transport material are licensed for such activity in accordance to applicable state and federal regulations. Obtain the necessary disposal facility approvals and WDNR approvals for disposal. Do not transport petroleum-contaminated soil or regulated solid waste off-site without obtaining the approval of the environmental consultant and engineer and notifying the disposal facility.

During excavations in the areas of known contamination, larger chunks of clean concrete (~2 cubic feet), asphalt and bricks will be segregated from the fill, to the extent practical and managed as common excavation. Under NR 500.08 this material is exempt from licensing and requirements of Wisconsin Administrative Code NR 500-538 of the solid waste regulations, and will be reused as designated by the engineer as fill on the project, or it will be disposed of off-site at the contractor's disposal site(s).

If dewatering is required in an area of known contamination, water generated from dewatering activities may contain low-concentrations of petroleum compounds and metals. Based on the limited groundwater testing performed in the Phase 2.5 investigation, the water generated may meet the effluent limits specified in "Contaminated Groundwater from Remedial Action Operations" (WPDES Permit No. WI-0046566-5), Table 3.1 once standard construction sediment removal is employed. Notify the engineer of any dewatering activities, and obtain any permits necessary to discharge water. Provide copies of such Permit to the engineer. Ensure continuous dewatering and excavation safety at all times. Provide, operate, and maintain adequate pumping equipment and drainage and disposal facilities. Meet any requirements and pay any costs for obtaining and complying with such permit use. Follow all applicable legislative statutes, judiciary decisions, and regulations of the State of Wisconsin.

Costs associated with excavation dewatering in the contaminated areas are considered incidental to this pay item. The Wisconsin Department of Transportation will be the generator of petroleum-contaminated soil and regulated solid waste from this construction project.

D Measurement

The department will measure Management of Petroleum-Contaminated Soil and Solid Waste by the ton of soil or waste accepted by the disposal facility and as documented by weight tickets.

E Payment

The department will pay for measured quantities at the contract unit price under the following item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0195.0700	Management of Petroleum Contaminated Soil and Solid Waste	Ton

Payment is full compensation for excavating, segregating, loading, hauling, and landfill disposal of petroleum-contaminated soil and solid waste; obtaining solid waste collection and transportation service operating licenses; assisting in the collection of soil samples for field evaluation; and for dewatering of soils prior to transport, if necessary.

ADDITIONAL SPECIAL PROVISION 1 (ASP 1)
FOR TRANSPORTATION ALLIANCE FOR NEW SOLUTIONS (TrANS)
PROGRAM EMPLOYMENT PLACEMENTS AND APPRENTICESHIPS

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Section 5204(e) – Surface Transportation Workforce Development Training and Education, provides for 100 percent Federal funding if the core program funds are used for training, education, or workforce development purposes, including "pipeline" activities. The core programs includes: Congestion Mitigation and Air Quality Improvement (CMAQ) Program, Highway Bridge Program (HBP), Interstate Maintenance (IM), National Highway System (NHS), and Surface Transportation Program (STP). These workforce development activities cover surface transportation workers, including OJT/SS programs for women and minorities as authorized in 23 U.S.C. §140(b).

TrANS is an employment program originally established in 1995 in Southeastern Wisconsin. Currently TrANS has expanded to include TrANS program locations to serve contractors in Southeast (Milwaukee and surrounding counties), Southcentral (Dane County and surrounding counties including Rock County), and most Northeastern Wisconsin counties from locations in Keshena, Rhinelander and surrounding far Northern areas. TrANS attempts to meet contractor's needs in other geographic locations as possible. It is an industry driven plan of services to address the outreach, preparation, placement and retention of women, minorities and non-minorities as laborers and apprentices in the highway skilled trades. These candidate preparation and contractor coordination services are provided by community based organizations. For a list of the TrANS Coordinators contact the Disadvantaged Business Enterprise Office at (414) 438-4583 in Milwaukee or (608) 266-6961 in Madison. These services are provided to you at no cost.

I. BASIC CONCEPTS

Training reimbursements to employing contractors for new placements, rehires or promotions to apprentice of TrANS Program graduates will be made as follows:

1) **On-the-Job Training, Item ASP.1T0G, ASP 1 Graduate.** At the rate of $5.00 per hour on federal aid projects when TrANS graduates are initially hired, or seasonally rehired, as unskilled laborers or the equivalent.

   Eligibility and Duration: To the employing contractor, for up to 2000 hours from the point of initial hire as a TrANS program placement.

   Contract Goal: To maintain the intent of the Equal Employment Opportunity program, it is a goal that __6__ *(number)* TrANS Graduate(s) be utilized on this contract.

2) **On-the-Job Training, Item ASP.1T0A, ASP 1 Apprentice.** At the rate of $5.00 per hour on federal aid projects at the point when an employee who came out of the TrANS Program is subsequently entered into an apprenticeship contract in an underutilized skilled trade (this will include the Skilled Laborer Apprenticeship when that standard is implemented).

Eligibility and Duration: To the employing contractor, for the length of time the TrANS graduate is in apprentice status.

Contract Goal: To maintain the intent of the Equal Employment Opportunity program, it is a goal that __6__ *(number)* TrANS Apprentice(s) be utilized on this contract.

3) The maximum duration of reimbursement is two years as a TrANS graduate plus time in apprentice status.

4) If a TrANS program is not available in the contractor's area and another training program is utilized, payment of On-the-Job Training hours may be approved by the Wisconsin Department of Transportation (WisDOT) if the training program meets the established acceptance criteria. Only On-the-Job Training Hours accumulated after WisDOT approval will be reimbursed as specified under Items ASP.1T0G and ASP.1T0A. For more information, contact the Disadvantaged Business Enterprise Office at the phone numbers listed above.

5) WisDOT reserves the right to deny payments under items ASP.1T0G and ASP.1T0A if the contractor either fails to provide training or there is evidence of a lack of good faith in meeting the requirements of this training special provision.

I. RATIONALE AND SPECIAL NOTE

The $5.00 per hour now being paid for TrANS placements is intended to cover the duration of two years to allow for reaching entry-level laborer status. An additional incentive, the $5.00 rate, would promote movement into the underutilized skilled trades' apprenticeships and applies until the individual completes their apprenticeship. These incentives benefit TrANS candidates by giving them a better opportunity to enter a skilled trade; benefits contractors who will be assisted in meeting their EEO profiles and goals; and benefits the public who will see the program reinforce larger public-private employment reform in Wisconsin. The pool of TrANS graduates was created for the purpose of addressing underutilization in the skilled trades, an objective that is further reinforced by a parallel retention pilot program, known as the Companywide Reporting. *Whether or not reimbursement is involved, the WisDOT reassures contractors who are in the Companywide Program that TrANS placements still contribute toward fulfilling the new hire goal of 50% women and minorities.* Based on data administered by United States Department of Labor (US DOL), the highway skilled trades remain underutilized for women statewide (less than 6.9%); and for minorities in all counties (% varies by county).

NOTE: *Unless using other advancement strategies, contractors are encouraged to use some or all of this monetary incentive to offset the cut in hourly wages an individual may incur when entering an apprenticeship if the full general laborer hourly rate has been previously paid. No special accounting measures are required.*

II. IMPLEMENTATION

The implementation of ASP 1 is intended to cover only the amount of time it takes for underutilization to be resolved across the trades. This will be measured annually at the county and/or state levels using data administered by WisDWD in relation to goals set by the USDOL-

OFCCP. With appropriate state and federal approvals, we may also do some measurement at the company level.

It is the contractor's responsibility to note on their Certified Payrolls if their employee is a TrANS graduate or a TrANS apprentice. The District EEO Coordinators utilize the information on the Certified Payrolls to track the hours accumulated by TrANS Graduates and TrANS apprentices on WisDOT contracts. Payment under this ASP 1 is made based on the hours recorded off of the Certified Payrolls. Tracking may eventually include improved linkages with the WisDWD apprentice database, information from company and committee level sources.

TrANS is nondiscriminatory by regulation, and is a tool for optional use by contractors to address the underutilization of women and minorities as laborers and apprentices in our industry's skilled trades.

IV. *TRANS TRAINING*

As part of the contractor's equal employment opportunity affirmative action program, training shall be provided to employees enrolled in apprenticeship and on-the-job training programs as follows:

The contractor shall provide on-the-job training aimed at developing full journey workers in the type of trade or job classifications involved. In the event the contractor subcontracts a portion of the contract work, the contractor shall determine how many, if any, of the trainees are to be trained by the subcontractor provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract.

Training and upgrading of minorities and women toward journey workers status is a primary objective of this training special provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority trainees and women trainees); to the extent such persons are available within a reasonable area of recruitment. The contractor will be given an opportunity and will be responsible for demonstrating the steps that they have taken in pursuance thereof, prior to determination as to whether the contractor is in compliance with this training special provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journey workers status or in which they have been employed as a journey worker. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the contractor's records should document the findings in each case.

V. APPRENTICESHIP TRAINING

The Federal Highway Administration's (FHWA) policy is to require full use of all available training and skill improvement opportunities to assure increased participation of minority groups, disadvantaged persons and women in all phases of the highway construction industry. The FHWA On-the-Job Training (OJT) Program requires the State transportation agencies (STAs) to establish apprenticeships and training programs targeted to move women, minorities, and disadvantaged individuals into journey-level positions to ensure that a competent workforce is available to meet highway construction hiring needs, and to address the historical under-representation of members of these groups in highway construction skilled crafts.

The OJT Supportive Services (OJT/SS) Program was established in Title 23 Code of Federal Regulations (CFR), Part 230) to supplement the OJT program and support STA training programs by providing services to highway construction contractors and assistance to highway construction apprentices and trainees. The primary objectives of OJT/SS are:

(1) To increase the overall effectiveness of the State highway agencies' approved training programs.
(2) To seek other ways to increase the training opportunities for women, minorities, and disadvantaged individuals.

The STAs are responsible for establishing procedures, subject to the availability of Surface Transportation and Bridge Funds under 23 U.S.C. §140(b*)* (Nondiscrimination), for the provision of supportive services with respect to training programs approved under 23 CFR, Part 230(a*)* (Equal Employment Opportunity on Federal and Federal-aid Construction Contracts – including Supportive Services).

The contractor and subcontractor shall maintain records to demonstrate compliance with these apprenticeship requirements. Reasonable exemptions and modifications to and from any or all of these requirements will be determined by the Wisconsin Department of Transportation-Civil Rights Office. A request for an exemption or modification, with justification, shall be made in writing, addressed to WisDOT Civil Rights Office, 4802 Sheboygan Avenue, P.O. Box 7965, Rm. 451, Madison, WI 53707.

ADDITIONAL SPECIAL PROVISION 3
DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

1. Description

General

a. The disadvantaged business enterprise (DBE) requirements of 49 CFR Part 26 apply to this contract. The department's DBE goal is shown on the cover of the bidding proposal. The contractor can meet the specified contract DBE goal by procuring services or materials from a DBE or by subcontracting work to a DBE. The department calculates the DBE participation as the dollar value of DBE participation included in the bid expressed as a percentage of the total contract bid amount.

b. Under the contract, the contractor agrees to provide the assistance to participating DBE's in the following areas:

   i. Produce accurate and complete quotes.
   ii. Understand highway plans applicable to their work.
   iii. Understand specifications and contract requirements applicable to their work.
   iv. Understand contracting reporting requirements.

c. The department encourages the contractor to assist and develop DBE firms to become fully knowledgeable contractors to successfully perform on its contracts.

d. For information on the disadvantaged business program, visit the department's Civil Rights and Compliance Section website at:

   http://www.dot.wisconsin.gov/business/engrserv/dbe-main.htm

2. Definitions

a. Interpret these terms, used throughout this additional special provision, as follows:

   i. **Bid Percentage:** The DBE percentage indicated in the bidding proposal at the time of bid.
   ii. **DBE:** A disadvantaged business enterprise (DBE) certified as a DBE by the department and included on the department's list of certified DBE's who are determined to be ready, willing and able.
   iii. **DBE goal:** The amount of DBE participation expected in the contract as shown on the cover of the Highway Work Proposal.
   iv. **Discretionary Goal:** A contractor assigned DBE goal, typically abbreviated as “Disc” on the cover of the Highway Work Proposal, which is enforced as committed.
   v. **Manufacturer:** A firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract.
   vi. **Supplier:** A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment required under the contract are bought, kept in stock, and regularly sold or leased to the public.
   vii. **Voluntary Achievement:** The amount of DBE participation achieved and reported in the contract in excess of the assigned goal.

3. DBE Percentage Required at Bid Submission

Indicate the bid percentage (i.e. 0% through 100%) of DBE participation on the completed bidding proposal, including projects with discretionary goals. For electronic submittals, show the percentage in the miscellaneous data folder, Item 3, DBE Percent. For paper submittals, show the percentage on the sheet included after the schedule of items. By submission of the bid, the bidder contractually commits to DBE participation at or above the bid percentage, or certifies that they have utilized

comprehensive good faith efforts to solicit and utilize DBE firms to meet the DBE participation requirements of this contract proposal, and that the bid percentage is reflective of these good faith efforts. If the bidder does not indicate the bid percentage of DBE participation on the completed bidding proposal, the department will consider the bid irregular and may reject the bid.

4. Department's DBE Evaluation Process

a. Documentation Submittal

Within 10 business days after the notification of contract award, the contractor is to identify, by name, the DBE firms whose utilization is intended to satisfy this provision, the items of work of the DBE subcontract or supply agreement and the dollar value of those items of work by completing the Commitment to Subcontract to DBE Form [DT1506] and all necessary attachment A forms, as well as, Good Faith Waiver Form [DT1202] and supporting documentation as necessary. If the contractor fails to furnish the required forms within the specified time, the department may cancel the award. Delay in fulfilling this requirement is not a cause for extension of the contract time and shall not be used as a tool to delay execution.

i. Bidder Meets DBE Goal

If the bidder indicates that the contract DBE goal is met, after award and before execution, the department will evaluate the Commitment to Subcontract to DBE Form DT1506 and attachment A(s) to verify the actual DBE percentage achieved. If the DBE commitment is verified, the contract is eligible for execution with respect to the DBE commitment.

ii. Bidder Does Not Meet DBE Goal

(1) If the bidder indicates a bid percentage on the Commitment to Subcontract to DBE Form [DT1506] that does not meet the contract DBE goal, the bidder must submit a Good Faith Waiver Form [DT1202] and supporting documentation. After award and before execution, the department will evaluate the bidder's DBE commitment and consider the bidder's good faith waiver request.

(2) The department will review the bidder's good faith waiver request and notify the bidder of one of the following:

a. If the department grants a good faith waiver, the bid is eligible for contract execution with respect to DBE commitment.

b. If the department rejects the good faith waiver request, the department may declare the bid ineligible for execution. The department will provide a written explanation of why the good faith waiver request was rejected. The bidder may appeal the department's rejection as allowed under 7 a. & b.

5. Department's Criteria for Good Faith Effort

The Code of Federal Regulations {CFR}, 49 CFR Part 26-Appendix A, is the guiding regulation concerning good faith efforts. However, the federal regulations do not define “good faith” but states that bidder must actively and aggressively attempt to meet the goal. The federal regulations are general and do not include every factor or effort that can be considered. As a result, each state must establish its own processes and consider the factors established in its own process when making a determination of good faith.

a. The department will only grant a good faith waiver if the bidder has made the effort, given the relevant circumstances under the contract that a bidder actively and aggressively seeking to meet the goal would make. The department will evaluate the bidder's good faith effort to determine whether a good faith waiver will be granted. The bidder must demonstrate, on the DT1202 that they have aggressively solicited DBE participation in an attempt to meet the contract DBE goal and attaining the stated DBE goal is not feasible.

b. The department, in conjunction with industry stakeholders, has developed the following guidance for contractor good faith effort. The guidance and the attached appendices provide a framework for the actions required by all parties in the processing and evaluation of bidder's total efforts to achieve the project specific DBE goal prior to the bid letting date.

c. Prime Contractors should:
   i. Document all efforts and decisions made toward achieving the DBE goal on the contract. The bidder should use the Civil Rights & Compliance System [CRCS] and related WisDOT-approved DBE outreach tools, including the Bid Express Small Business Network, to foster DBE participation on all applicable contracts.

   ii. Request quotes by identifying potential items to subcontract and solicit. Prime contractors are strongly encouraged to include in their initial contacts a single page including a detailed list of items for which they are accepting quotes, by project, within a letting. *See attached sample entitled "Sample Contractor Solicitation Letter" in Appendix A*. Prime contractors should also indicate a willingness to accept quotes in areas they are planning to perform themselves, ***as required by federal rules***. In some cases, it might be appropriate to use DBE's to do work in a prime contractor's area of specialization.

      (1) Solicit quotes through all reasonable and available means from certified DBE firms who match 'possible items to subcontract' and send copies to DBESS office, highlighting areas in which you are seeking quotes. Email is acceptable.

      (2) SBN is the preferred outreach tool. https://www.bidx.com/wi/main. Other acceptable means include postal mail, email, fax, phone call.

         a. Primes must ask DBE firms for a response in their solicitations. See *Sample Contractors Solicitation Letter* in Appendix. This letter can be included as an attachment to the SBN sub-quote request.

         b. Solicit quotes at least 10 calendar days prior to the letting date {ideally two Fridays before the letting} to allow DBE firms sufficient time to respond. Prime contractors should contact DBE firms early, asking them if they need help in putting together a quote, or helping to arrange for equipment needs, or solve other problems.

      (3) Second solicitation should take place within 5 days
         a. An email solicitation is highly recommended for this second solicitation

      (4) Upon request, provide interested DBE firms with adequate information about plans, specifications and the requirements of the contract by letter, information session, email, phone call and/or referral.

      (5) When potential exists, advise interested DBE firms on how to obtain bonding, line of credit or insurance as may be requested.

      (6) Document DBE firm's interest in quoting by taking appropriate steps to follow up initial solicitation with:
         a. Email to all prospective DBE firms in relevant work areas
         b. Phone call log to DBE firms who express interest via written response or call.
         c. Fax/letter confirmation
         d. Copy of the DBE quotes
         e. Signed copy of Bid Express SBN Record of Subcontractor Outreach Effort.

d. Evaluate DBE quotes as documentation is critical if the prime does not utilize the DBE firm's quote for any reason.
   i. Evaluate DBE firm's capability to perform 'possible items to subcontract' using legitimate reasons, including but not limited to, ***a discussion with the DBE firm*** regarding its

capabilities prior to the bid letting. If lack of capacity is your reason for not utilizing the DBE quote, you are required to contact the DBE directly regarding their ability to perform the work indicated in the UCP directory as their work area [NAICS code]; only the work area and/or NAICS code listed in the UCP directory will be counted for DBE credit. Documentation of the conversation is required.

ii. In striving to meet a DBE conscious contract goal, prime contractors are expected to use DBE quotes that are responsive and reasonable. This includes DBE quotes that are not the low quote.

iii. **Special Circumstance:** Evaluation of DBE quotes with tied bid items. "Tied quotes are the condition in which a subcontractor submits quotes including multiple areas of expertise across multiple work areas noting that the items and price are tied. Typically this type of quoting represents a cost saving to the prime but is not clearly stated as a discount; tied quotes are usually presented as 'all or none' quote to the prime." When non-DBE subcontractors submit tied bid items in their quotes to the prime, the DBE firms' quote may seem not competitive. In such a case, the following steps are taken in comparing the relevant quotes. These are qualitative examples.

(1) Compare bid items common to both quotes, noting the reasonableness in the price comparison.

(2) Review quotes from other firms for the bid items not quoted by the DBE firm to see if combining both can provide the same competitive advantage that the tied bid items offered.

e. After notification of contract award, submit **'Commitment to Subcontract'** form within the time period specified in the contract.

i. Provide the following information along with department form DT1202:

(1) The names, addresses, e-mail addresses, telephone numbers of DBE's contacted. The dates of both initial and follow-up contact. A printed copy of SBN solicitation is acceptable.

(2) A description of information provided to the DBE's regarding the plans, specifications, and estimated quantities for portions of the work to be performed by that DBE.

(3) Photocopies or electronic copies of all written solicitations to DBE's.

(4) Documentation of each quote received from a DBE and, if rejected, the reason for that rejection.

(5) Bidder attendance at any pre-solicitation or pre-bid meetings the department held to inform DBE's of participation opportunities available on the project.

f. The department's DBE Support Services Office is available by phone, email or in writing to request assistance in meeting the DBE goal:

DBE Support Services Office
6150 Fond du Lac Ave.
Milwaukee, WI 53218
Phone: 414-438-4583 / 608-266-6961
Fax: 414-438-5392
E-mail: DOTDBESupportServices@dot.wi.gov

6. Bidder's Appeal Process

a. A bidder can appeal the department's decision to deny the bidder's good faith waiver request. The bidder must provide written documentation refuting the specific reasons for rejection as stated in the department's rejection notice. The bidder may meet in person with the department if so

requested. Failure to appeal within 7 calendar days after receiving the department's written notice of rejection of a good faith waiver request under constitutes a forfeiture of the bidder's right of appeal. If the bidder does not appeal, the department may declare the bid ineligible for execution.

b. The department will appoint a representative, who did not participate in the original determination, to assess the bidder's appeal. The department will issue a written decision within 7 calendar days after the bidder presents all written and oral testimony. In that written decision, the department will explain the basis for finding that the bidder did or did not meet the contract DBE goal or make an adequate good faith effort to meet the contract DBE goal. The department's decision is final. If the department finds that the bidder did not meet the contract DBE goal or did not make adequate efforts to meet the DBE goal, the department may declare the bid ineligible for execution.

7. Department's Criteria for DBE Participation

Department's DBE List

a. The department maintains a DBE list on the department's website at

http://app.mylcm.com/wisdot/Reports/WisDotUCPDirectory.aspx

b. The DBE office is also available to assist at 414-438-4583 or 608-266-6961.

8. Counting DBE Participation

Assessing DBE Work

a. The department will only count the DBE usage towards the contract DBE goal if the DBE firm is certified as a DBE by one of the unified certification program agencies. If a firm becomes DBE certified before entering into a subcontract, the department may consider that DBE usage towards the contract goal. The department only counts the value of the work a DBE actually performs towards the DBE goal. The department assesses the DBE work as follows:

b. The department counts work performed by the DBE's own resources. The department includes the cost of materials and supplies the DBE obtains for the work. The department also includes the cost of equipment the DBE leases for the work. The department will not include the cost of materials, supplies, or equipment the DBE purchases or leases from the prime contractor or its affiliate, except the department will count non-project specific leases the DBE has in place before the work is advertised.

c. The department counts fees and commissions the DBE charges for providing a bona fide professional, technical, consultant, or managerial services. The department also counts fees and commissions the DBE charges for providing bonds or insurance. The department will only count costs the engineer deems reasonable based on experience or prevailing market rates.

d. If a DBE subcontracts work, the department counts the value of the subcontracted work only if the DBE's subcontractor is also a DBE.

e. The contractor shall maintain records and may be required to furnish periodic reports documenting its performance under this item.

f. It is the prime contractor’s responsibility to determine the DBE's ability to perform the work with the use of the UCP directory.

9. Commercially Useful Function

a. The department counts expenditures of a DBE toward the DBE goal only if the DBE is performing a commercially useful function on that contract.

b. A DBE is performing a commercially useful function if the following conditions are met:

c. For contract work, the DBE is responsible for executing a distinct portion of the contract work and it is carrying out its responsibilities by actually performing, managing, and supervising that work.

d. For materials and supplies, the DBE is responsible for negotiating price, determining quality and quantity, ordering, and paying for those materials and supplies.

10. Trucking

All bidders are expected to adhere to the department's current trucking policy posted on the HCCI website at

http://www.dot.wisconsin.gov/business/engrserv/docs/dbe-trucking-notice.pdf

11. Manufacturers and Suppliers

The department counts material and supplies a DBE provides under the contract. The department will give full credit toward the DBE goal if the DBE is a manufacturer of those materials or supplies. The department will give 60 percent credit toward the DBE goal if the DBE is merely a supplier of those materials or supplies. It is the bidder's responsibility to find out if the DBE is considered a supplier or a manufacturer before listing them on Commitment to Subcontract to DBE form DT1506.

12. DBE Prime

If the prime contractor is a DBE, the department will only count the work the contractor performs with its own forces, the work DBE subcontractors perform, and the work DBE suppliers or manufacturers perform.

13. Joint Venture

If a DBE performs as a participant in a joint venture, the department will only count that portion of the total dollar value of the contract equal to that portion of the work that the DBE performs with its own forces.

14. Mentor Protégé

a. If a DBE performs as a participant in a mentor protégé agreement, the department will credit the portion of the work performed by the DBE protégé firm

b. On every other project that the mentor protégé team identifies itself on.

c. For no more than one half of the total contracted DBE goal on any WisDOT project.

15. DBE Replacement

In the event a Prime Contractor needs to replace a DBE firm originally listed on the approved DBE Commitment Form DT1506, the Prime Contractor must comply with the department's DBE Replacement Policy located on the DBE page on the following web site:

http://www.dot.wisconsin.gov/business/engrserv/docs/policyreplacingdbe.pdf

16. Changes to the approved DBE Commitment Form DT1506

If there are any changes to the approved Commitment to Subcontract to DBE Form DT1506, the prime contractor must submit a revised DBE Commitment Form DT1506 and relevant attachment A(s) to the DBE Programs Office within 5 business days.

17. Contract Modifications

When additional opportunity is available by contract modifications, the Prime Contractor shall utilize DBE Subcontractors, that were committed to equal work items, in the original contract.

18. Payment

Costs for conforming to this Additional Special Provision (ASP) and any associated DBE requirements are incidental to the contract.

APPENDIX A
Sample Contractor Solicitation Letter Page 1
This sample is provided as a guide not a requirement

GFW SAMPLE MEMORANDUM

TO: DBE FIRMS

FROM: POTENTIAL PRIME CONTRACTOR OR MAJOR SUBCONTRACTOR

SUBJECT: **REQUEST FOR DBE QUOTES**

LET DATE & TIME

DATE: MONTH DAY YEAR

CC: DBE OFFICE ENGINEER

Our company is considering bidding on the projects indicated on the next page, as a prime and/or a subcontractor for the Wisconsin Department of Transportation Month- date -year Letting. Page 2 lists the projects and work items that we may subcontract for this letting. We are interested in obtaining subcontractor quotes for these projects and work categories. Also note that we are willing to accept quotes in areas we may be planning to perform ourselves as required by federal rules.

Please review page 2, respond whether you plan to quote, highlight the projects and work items you are interested in performing and return it via fax or email within 3 days. Plans, specifications and addenda are available through WisDOT at the DBE Support Services office or at the Highway Construction Contract Information (HCCI) site at http://roadwaystandards.dot.wi.gov/hcci/

Your quote should include all of the costs required to complete the items you propose to perform including labor, equipment, material, and related bonding or insurance. The quote should note items that you are DBE certified to perform, tied items, and any special terms. Page 2, with the indicated projects and items you plan to quote, should be used as a cover sheet for your quote.

Please make every effort to have your quotes into our office by time deadline the prior to the letting date. ***Make sure the correct letting date, project ID and proposal number, unit price and extension are included in your quote.*** We prefer quotes be sent via SBN but prime's alternative's are acceptable. Our office hours are include hours and days. Please call our office as soon as possible prior to the letting if you need information/clarification to prepare your quote at contact number.

If you wish to discuss or evaluate your quote in more detail, contact us after the contract is awarded. Status of the contract can be checked at WisDOT's HCCI site at http://roadwaystandards.dot.wi.gov/hcci/

All questions should be directed to:

Project Manager, John Doe,
Phone: (000) 123-4567
Email: Joe@joetheplumber.com
Fax: (000) 123- 4657

Sample Contractor Solicitation Letter Page 2

This sample is provided as a guide not a requirement

REQUEST FOR QUOTATION

Prime's Name: _____

Letting Date: _____

Project ID: _____

Please check all that apply

- ☐ Yes, we will be quoting on the projects and items listed below
- ☐ No, we are not interested in quoting on the letting or its items referenced below
- ☐ Please take our name off your monthly DBE contact list
- ☐ We have questions about quoting this letting. Please have some one contact me at this number

Prime Contractor 's Contact Person		DBE Contractor Contact Person	
Phone:		Phone	
Fax:		Fax	
Email:		Email	

Please circle the jobs and items you will be quoting below

Proposal No.	1	2	3	4	5	6	7
County							

WORK DESCRIPTION:

Clear and Grub	X		X	X		X	X
Dump Truck Hauling	X		X	X		X	X
Curb & Gutter/Sidewalk, Etc.	X		X	X		X	X
Erosion Control Items	X		X	X		X	X
Signs and Posts/Markers	X		X	X		X	X
Traffic Control		X	X	X		X	X
Electrical Work/Traffic Signals		X	X	X		X	
Pavement Marking		X	X	X	X	X	X
Sawing Pavement		X	X	X	X	X	X
QMP, Base	X	X		X	X	X	X
Pipe Underdrain	X			X			
Beam Guard				X	X	X	X
Concrete Staining							X
Trees/Shrubs	X						X

Again please make every effort to have your quotes into our office by time deadline prior to the letting date.

We prefer quotes be sent via SBN but prime's preferred alternative's are acceptable.

If there are further questions please direct them to the prime contractor's contact person at phone number.

APPENDIX B
BEST PRACTICES FOR PRIME CONTRACTOR & DBE SUBCONTRACTOR GOOD FAITH EFFORT

This list is not a set of requirements; it is a list of potential strategies

Primes

- Prime contractor open houses inviting DBE firms to see the bid "war room" or providing technical assistance
- Participate in speed networking and mosaic exercises as arranged by DBE office
- Host information sessions not directly associated with a bid letting;
- Participate in a formal mentor protégé or joint venture with a DBE firm
- Participate in WisDOT advisory committees i.e. TRANSAC, or Mega Project committee meetings
- Facilitate a small group DBE 'training session' Clarifying how your firm prepares for bid letting, evaluates subcontractors, preferred qualifications and communication methods
- Encourage subcontractors to solicit and highlight DBE participation in their quotes to you
- Quality of communication, not quantity creates the best results. Contractors should do as thorough a job as possible in communicating with DBE firms before the bid and provide any assistance requested to assure best possible bid.

DBE

- DBE firms should contact primes as soon as possible with questions regarding their quotes or bid; seven days prior is optimal.
- Continually check for contract addendums on the HCCI website through the Thursday prior to letting to stay abreast of changes.
- Review the status of contracts on the HCCI website reviewing the 'apparent low bidder' list, and bid tabs at a minimum.
- Prepare a portfolio or list of related projects and prime and supplier references; be sure to note transportation-related projects of similar size and scope, firm expertise and staffing.
- Participate in DBE office assessment programs
- Participate on advisory and mega-project committees
- Sign up to receive the DBE Contracting Update
- Consider membership in relevant industry or contractor organizations
- Active participation is a must. Quote as many projects as you can reasonably work on; quoting the primes and bidding as a prime with the department are the only ways to get work.

APPENDIX C
Types of Efforts considered in determining GFE
This list represents concepts being assessed; analysis requires additional steps

1. Whether the contractor attended any pre-solicitation or pre-bid meetings that were scheduled by WisDOT to inform DBEs of contracting and subcontracting opportunities;
2. Whether the contractor provided written notice to a reasonable number of specific DBEs that their interest in the contract was being solicited, in sufficient time to allow the DBEs to participate effectively;
3. Whether the contractor followed up initial solicitations of interest by contacting DBEs to determine if the DBEs were interested; returned the phone calls of interested DBE firms.
4. Whether the contractor selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the DBE goal;
5. Whether the contractor provided interested DBEs with adequate information about the plans, specifications and requirements of the contract;
6. Whether the contractor negotiated in good faith with interested DBEs, not rejected DBEs as unqualified without sound reasons based on a thorough investigation of their capabilities;
7. Whether the contractor made efforts to assist interested DBEs in being more competitive.
8. Whether the contractor effectively used the services of available minority community organizations: minority contractors groups, local, state, and Federal minority business assistance offices, and other organizations that provide assistance to small businesses and DBE firms.
9. Whether Prime used CRCS to identify DBE who specialize in relevant work areas.
10. Whether the contractor used available resources including contacting the DBE office, using WisDOT's website
11. Whether the contractor returned calls of firms expressing interest in a timely manner.

APPENDIX D
Good Faith Effort Evaluation Guidance
Excerpt from Appendix A of 49 CFR Part 26

APPENDIX A TO PART 26 -- GUIDANCE CONCERNING GOOD FAITH EFFORTS

I. When, as a recipient, you establish a contract goal on a DOT assisted contract, a bidder must, in order to be responsible and/or responsive, make good faith efforts to meet the goal. The bidder can meet this requirement in either of two ways. First, the bidder can meet the goal, documenting commitments for participation by DBE firms sufficient for this purpose. Second, even if it doesn't meet the goal, the bidder can document adequate good faith efforts. This means that the bidder must show that it took all necessary and reasonable steps to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not fully successful.

II. In any situation in which you have established a contract goal, part 26 requires you to use the good faith efforts mechanism of this part. As a recipient, it is up to you to make a fair and reasonable judgment whether a bidder that did not meet the goal made adequate good faith efforts. It is important for you to consider the quality, quantity, and intensity of the different kinds of efforts that the bidder has made. The efforts employed by the bidder should be those that one could reasonably expect a bidder to take if the bidder were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE contract goal. Mere pro forma efforts are not good faith efforts to meet the DBE contract requirements. We emphasize, however, that your determination concerning the sufficiency of the firm's good faith efforts is a judgment call: meeting quantitative formulas is not required.

III. The Department also strongly cautions you against requiring that a bidder meet a contract goal (i.e., obtain a specified amount of DBE participation) in order to be awarded a contract, even though the bidder makes an adequate good faith efforts showing. This rule specifically prohibits you from ignoring bona fide good faith efforts.

IV. The following is a list of types of actions which you should consider as part of the bidder's good faith efforts to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

A. Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

B. Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.

C. Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

D. (1) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

(2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Prime contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

E. Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non solicitation of bids in the contractor's efforts to meet the project goal.

F. Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.

G. Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

H. Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

V. In determining whether a bidder has made good faith efforts, you may take into account the performance of other bidders in meeting the contract. For example, when the apparent successful bidder fails to meet the contract goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts, the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the goal, but meets or exceeds the average DBE participation obtained by other bidders, you may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made good faith efforts.

Appendix E
Small Business Network [SBN] Overview

The Small Business Network is a part of the Bid Express® service that was created to ensure that prime bidders have a centralized online location to find subs - including small and disadvantaged business enterprises (DBEs). It is available for prime bidders to use as part of their Basic Service subscription. Within the Small Business Network, **Prime Contractors** can:

1. Easily select proposals, work types and items:
    a. After adding applicable work types, select items that you wish to quote. Enter the sub-quote quantities and add comments, if desired. Adding or removing items and work types can be done quickly. If needed, you can save the sub-quote for completion at a later time.
2. Create sub-quotes for the subcontracting community:
    a. Create sub-quotes with ease using the intuitive sub-quote creator. In seven short steps, you can rapidly create a custom sub-quote directed to all subcontractors that bid on the applicable work types. Steps include: provide contact information and sub-quote expiration date, select letting and proposal, add work types and items, specify terms and conditions, upload attachments, and select vendors.
    b. Create a sub-quote to send to subcontractors or suppliers that lists the items in a proposal that you want quoted
    c. Create an unlimited number of sub-quotes for items you want quoted, and optionally mark them as a DBE-preferred request
    d. Add attachments to sub-quotes
3. View sub-quote requests & responses:
    a. After logging into the Bid Express service, you can quickly review all of your sub-quote requests and all unsolicited sub-quote requests from subcontractors. To simplify the Small Business Network home screen, sub-quote requests can be hidden with one click if they are not applicable.
    b. View or receive unsolicited sub-quotes that subcontractors have posted, complete with terms, conditions and pricing
4. View Record of Subcontractor Outreach Effort:
    a. For each sub-quote produced, a *Record of Subcontractor Outreach Effort* is generated that shows the response statistics for a particular sub-quote. If accepted by the letting agency, this report may serve as proof of a "Good Faith" effort in reaching out to the DBE community.
    b. Easily locate pre-qualified and certified small and disadvantaged businesses
    c. Advertise to small and disadvantaged businesses more efficiently and cost effectively
    d. Document your interactions with subs/DBEs by producing an Outreach Report (may be accepted as proof of DBE outreach at the discretion of each agency)

The Small Business Network is a part of the Bid Express® service that was created to ensure that small businesses have a centralized area to access information about upcoming projects. It can help small businesses learn more about opportunities, compete more effectively, network with other contractors and subcontractors, and win more jobs.

1. View and reply to sub-quote requests from primes:
    a. After logging into the Bid Express service, you can quickly review all incoming sub-quote requests and all unsolicited sub-quotes created by your company. Receive notifications by selected work type. To simplify on the Small Business Network home screen, sub-quote requests can be filtered by work types relevant to your interests, or hidden with one click if they are not applicable.
2. Select items when responding to sub-quote requests from primes:
    a. You have the freedom to choose and price any number of items when responding to a sub-quote request. Quantities can be modified, and per-item comments are also available.
    b. View requests for sub-quotes for work that primes have posted for projects they are bidding, add your pricing, terms, and conditions, and submit completed sub-quotes to the requesting primes
    c. Add attachments to a sub-quote
3. Create and send unsolicited sub-quotes to specific contractors:
    a. Create unsolicited sub-quotes with ease using the intuitive sub-quote creator. In eight short steps, you can rapidly create a custom sub-quote directed at any number of specific vendors of your choosing. Steps include: provide contact information and sub-quote expiration date, select letting and proposal, add work types and items, specify terms and conditions, upload attachments, and select vendors.
4. Easily select and price items for unsolicited sub-quotes:
    a. After adding applicable work types, select items that you wish to quote. The extended price calculates automatically, cutting out costly calculation errors. Comments can be provided on an per-item basis as well.
    b. Create an unsolicited sub-quote that lists the items from a proposal that you want to quote, include pricing, terms and conditions, and send it to selected prime/plan holder
    c. Add attachments to a sub-quote
    d. Add unsolicited work items to sub-quotes that you are responding to
5. Easy Access to Valuable Information
    a. Receive a confirmation that your sub-quote was opened by a prime
    b. View Bid Tab Analysis data from past bids, including the high, average and low prices of items.
    c. View important notices and publications from DOT targeted to small and disadvantaged businesses
6. Accessing Small Business Network for WisDOT contracting opportunities
    a. If you are a contractor not yet subscribing to the Bid Express service, go to **www.bidx.com** and select "Order Bid Express." The Small Business Network is a part of the Bid Express Basic Service.
    b. DBE firms can request a Bid Express Small Business Network Account at no cost by calling 414-438-4588

ADDITIONAL SPECIAL PROVISION 4

Payment to First-Tier Subcontractors

Within 10 calendar days of receiving a progress payment for work completed by a subcontractor, pay the subcontractor for that work. The prime contractor may withhold payment to a subcontractor if, within 10 calendar days of receipt of that progress payment, the prime contractor provides written notification to the subcontractor and the department documenting "just cause" for withholding payment.

The prime contractor may also withhold routine retainage from payments due subcontractors.

Payment to Lower-Tier Subcontractors

Ensure that subcontracting agreements at all tiers provide prompt payment rights to lower-tier subcontractors that parallel those granted first-tier subcontractors in this provision.

Release of Routine Retainage

After granting substantial completion the department may reduce the routine retainage withheld from the prime contractor to 75 percent of the original total amount retained.

When the Department sends the semi-final estimate the department may reduce the routine retainage withheld from the prime contractor to 10 percent of the original total amount retained.

Within 30 calendar days of receiving the semi-final estimate from the department, submit written certification that subcontractors at all tiers are paid in full for acceptably completed work and that no routine retainage is being withheld. The department will pay the prime contractor in full and reduce the routine retainage withheld from the prime contractor to zero when the department approves the final estimate.

This special provision does not limit the right of the department, prime contractor, or subcontractors at any tier to withhold payment for work not acceptably completed or work subject to an unresolved contract dispute.

ADDITIONAL SPECIAL PROVISIONS 5

Fuel Cost Adjustment

A Description

Fuel Cost Adjustments will be applied to partial and final payments for work items categorized in Section B as a payment to the contractor or a credit to the department. ASP-5 shall not apply to any force account work.

B Categories of Work Items

The following items and Fuel Usage Factors shall be used to determine Fuel Cost Adjustments:

(1) Earthwork.		Unit	Gal. Fuel Per Unit
205.0100	Excavation Common	CY	0.23
205.0200	Excavation Rock	CY	0.39
205.0400	Excavation Marsh	CY	0.29
208.0100	Borrow	CY	0.23
208.1100	Select Borrow	CY	0.23
209.0100	Backfill Granular	CY	0.23
350.0102	Subbase	CY	0.28
350.0104	Subbase	Ton	0.14
350.0115	Subbase 6-Inch	SY	0.05
350.0120	Subbase 7-Inch	SY	0.05
350.0125	Subbase 8-Inch	SY	0.06
350.0130	Subbase 9-Inch	SY	0.07
350.0135	Subbase 10-Inch	SY	0.08
350.0140	Subbase 11-Inch	SY	0.09
350.0145	Subbase 12-Inch	SY	0.09

C Fuel Index

A Current Fuel Index (CFI) in dollars per gallon will be established by the Department of Transportation for each month. The CFI will be the price of No. 2 fuel oil, as reported in U.S. Oil Week, using the first issue dated that month. The CFI will be the average of prices quoted for Green Bay, Madison, Milwaukee and Minneapolis.

The base Fuel Index (BFI) for this contract is $2.90 per gallon.

D Computing the Fuel Cost Adjustment

The engineer will compute the ratio CFI/BFI each month. If the ratio falls between 0.85 and 1.15, inclusive, no fuel adjustment will be made for that month. If the ratio is less than 0.85 a credit to the department will be computed. If the ratio is greater than 1.15 additional payment to the contractor will be computed. Credit or additional payment will be computed as follows:

(1) The engineer will estimate the quantity of work done in that month under each of the contract items categorized in Section B.

(2) The engineer will compute the gallons of fuel used in that month for each of the contract items categorized in Section B by applying the unit fuel usage factors shown in Section B.

(3) The engineer will summarize the total gallons (Q) of fuel used in that month for the items categorized in Section B.

(4) The engineer will determine the Fuel Cost Adjustment credit or payment from the following formula:

$$FA = \left(\frac{CFI}{BFI} - 1 \right) x\ Q\ x\ BFI$$

(plus is payment to contractor; minus is credit to the department)

Where	FA	=	Fuel Cost Adjustment (plus or minus)
	CFI	=	Current Fuel Index
	BFI	=	Base Fuel Index
	Q	=	Monthly total gallons of fuel

E Payment

A Fuel Cost Adjustment credit to the department will be deducted as a dollar amount each month from any sums due to the contractor. A Fuel Cost Adjustment payment to the contractor will be made as a dollar amount each month.

Upon completion of the work under the contract, any difference between the estimated quantities and the final quantities will be determined. An average CFI, calculated by averaging the CFI for all months that fuel cost adjustment was applied, will be applied to the quantity differences. The average CFI shall be applied in accordance with the procedure set forth in Section D.

ADDITIONAL SPECIAL PROVISION 6

ASP 6 - Modifications to the standard specifications

Make the following revisions to the 2014 edition of the standard specifications:

101.3 Definitions

Replace the definition of semi-final estimate with the following effective with the December 2013 letting:

Semi-final estimate An estimate indicating the engineer has measured and reported all contract quantities and materials requirements.

105.11.1 Partial Acceptance

Replace paragraph two with the following effective with the December 2013 letting:

(2) Partial acceptance will relieve the contractor of maintenance responsibility for the designated portion of the work. By relieving the contractor of maintenance, the department does not relieve the contractor of responsibility for defective work or damages caused by the contractor's operations. Do not construe partial acceptance to be conditional final acceptance or final acceptance of any part of the project, or a waiver of any legal rights specified under 107.16.

105.11.2 Final Acceptance

Retitle and replace the entire text with the following effective with the December 2013 letting:

105.11.2 Project Acceptance

105.11.2.1 Inspection

105.11.2.1.1 General

(1) Notify the engineer when the project is substantially complete as defined in 105.11.2.1.3. As soon as it is practical, the engineer will inspect the work and categorize it as one of the following:

1. Unacceptable or not complete.
2. Substantially complete.
3. Complete.

105.11.2.1.2 Unacceptable or Not Complete

(1) The engineer will identify, in writing, work that is unacceptable or not complete. Immediately correct or complete that work. The engineer will assess contract time until the work is corrected or completed.

(2) Proceed as specified in 105.11.2.1.1 until the engineer determines that the work is complete.

105.11.2.1.3 Substantially Complete

(1) The project is substantially complete and the engineer will no longer assess contract time if the contractor has completed all contract bid items and change order work, except for the punch-list. As applicable, the following must have occurred:

1. All lanes of traffic are open on a finished surface.
2. All signage and traffic control devices are in place and operating.
3. All drainage, erosion control, excavation, and embankments are completed.
4. All safety appurtenances are completed.

(2) The engineer will provide a written punch-list enumerating work the contractor must perform and documents the contractor must submit before the the engineer will categorize the work as complete.

1. Punch-list work includes uncompleted cleanup work required under 104.9 and minor corrective work. Immediately correct or complete the punch-list work. The engineer may restart contract time if the contractor does not complete the punch-list work within 5 business days after receiving the written punch-list. The engineer and contractor may mutually agree to extend this 5-day requirement.
2. Punch-list documents include whatever contract required documentation is missing. The engineer may restart contract time if the contractor does not submit the punch-list documents within 15 business days after receiving the written punch-list. The engineer and contractor may mutually agree to extend this 15-day requirement.

(3) Proceed as specified in 105.11.2.1.1 until the work is complete.

105.11.2.1.4 Complete

(1) The project is complete when the contractor has completed all contract bid items, change order work, and punch-list work including the submission of all missing documentation.

105.11.2.2 Conditional Final Acceptance

(1) When the engineer determines that the project is complete, the engineer will give the contractor written notice of conditional final acceptance relieving the contractor of maintenance responsibility for the completed work.

105.11.2.3 Final Acceptance

(1) The engineer will grant final acceptance of the project after determining that all contract is work complete; all contract, materials, and payroll records are reviewed and approved; and the semi-final estimate quantities are final under 109.7.

(2) Failure to discover defective work or materials before final acceptance does not prevent the department from rejecting that work or those materials later. The department may revoke final acceptance if the department discovers defective work or materials after it has accepted the work.

105.13.3 Submission of Claim

Replace paragraph one with the following effective with the December 2013 letting:

(1) Submit the claim to the project engineer as promptly as possible following the submission of the Notice of Claim, but not later than final acceptance of the project as specified in 105.11.2.3. If the contractor does not submit the claim before final acceptance of the project, the department will deny the claim.

107.17.3 Railroad Insurance Requirements

Replace paragraph one with the following effective with the December 2013 letting:

(1) If required by the special provisions, provide or arrange for a subcontractor to provide railroad protective liability insurance in addition to the types and limits of insurance required in 107.26. Keep railroad protective liability insurance coverage in force until completing all work, under or incidental to the contract, on the railroad right of way or premises of the railroad and until the engineer determines that the work is complete as specified in 105.11.2.1.4.

107.26 Standard Insurance Requirements

Replace paragraph one with the following effective with the December 2013 letting:

(1) Maintain the following types and limits of commercial insurance in force until the engineer determines that the work is complete as specified in 105.11.2.1.4.

TABLE 107-1 REQUIRED INSURANCE AND MINIMUM COVERAGES

TYPE OF INSURANCE	MINIMUM LIMITS REQUIRED[1]
1. Commercial general liability insurance endorsed to include blanket contractual liability coverage.[2]	$2 million combined single limits per occurrence with an annual aggregate limit of not less than $4 million.
2. Workers' compensation.	Statutory limits
3. Employers' liability insurance.	Bodily injury by accident: $100,000 each accident Bodily injury by disease: $500,000 each accident $100,000 each employee
4. Commercial automobile liability insurance covering all contractor-owned, non-owned, and hired vehicles used in carrying out the contract.[2]	$1 million-combined single limits per occurrence.

[1] The contractor may satisfy these requirements with primary insurance coverage or with excess/umbrella policies.

[2] The Wisconsin Department of Transportation, its officers, agents, and employees shall be named as an additional insured under the general liability and automobile liability insurance.

108.14 Terminating the Contractor's Responsibility

Replace paragraph one with the following effective with the December 2013 letting:

(1) The contractor's responsibilities are terminated, except as set forth in the contract bond and specified in 107.16, when the department grants final acceptance as specified in 105.11.2.3.

109.2 Scope of Payment

Replace paragraph two with the following effective with the December 2013 letting:

(2) The department will pay for the quantity of work acceptably completed and measured for payment as the measurement subsection for each bid item specifies. Within the contract provide means to furnish and install the work complete and in-place. Payment is full compensation for everything required to perform the work under the applicable bid items including, but not limited to, the work elements listed in the payment subsection. Payment also includes all of the following not specifically excluded in that payment subsection:

1. Furnishing and installing all materials as well as furnishing the labor, tools, supplies, equipment, and incidentals necessary to perform the work.
2. All losses or damages, except as specified in 107.14, arising from one or more of the following:
    - The nature of the work.
    - The action of the elements.
    - Unforeseen difficulties encountered during prosecution of the work.
3. All insurance costs, expenses, and risks connected with the prosecution of the work.
4. All expenses incurred because of an engineer-ordered suspension, except as specified in 104.2.2.3.
5. All infringements of patents, trademarks, or copyrights.
6. All other expenses incurred to complete and protect the work under the contract.

109.6.1 General

Replace paragraphs three and four with the following effective with the December 2013 letting:

(3) The department’s payment of an estimate before conditional final acceptance of the work does not constitute the department’s acceptance of the work, and does not relieve the contractor of responsibility for:

1. Protecting, repairing, correcting, or renewing the work.
2. Replacing all defects in the construction or in the materials used in the construction of the work under the contract, or responsibility for damage attributable to these defects.

(4) The contractor is responsible for all defects or damage that the engineer may discover on or before the engineer’s conditional final acceptance of the work. The engineer is the sole judge of these defects or damage, and the contractor is liable to the department for not correcting all defects or damage.

109.7 Acceptance and Final Payment

Replace paragraphs one and two with the following effective with the December 2013 letting:

(1) After the engineer grants conditional final acceptance of the work as specified in 105.11.2.2 and reviews required document submittals and materials test reports, the engineer will issue the semi-final estimate.

(2) Within 30 calendar days after receiving the semi-final estimate, submit to the engineer a written statement of agreement or disagreement with the semi-final estimate. For an acceptable statement of disagreement, submit an item-by-item list with reasons for each disagreement. If the contractor does not submit this written statement within those 30 days, the engineer will process the final estimate for payment. The engineer and the contractor can mutually agree to extend this 30-day submission requirement.

450.3.3 Maintaining the Work

Replace paragraph one with the following effective with the December 2013 letting:

(1) Protect and repair the prepared foundation, tack coat, base, paved traffic lanes, shoulders, and seal coat. Correct all rich or bleeding areas, breaks, raveled spots, or other nonconforming areas in the paved surface.

455.3.2.5 Maintaining Tack Coat

Replace paragraph one with the following effective with the December 2013 letting:

(1) Protect and repair the existing surface and the tack coat. Correct areas with excess or deficient tack material and any breaks, raveled spots, or other areas where bond might be affected.

460.2.2.3 Aggregate Gradation Master Range

Replace paragraph one with the following effective with the January 2014 letting:

(1) Ensure that the aggregate blend, including recycled material and mineral filler, conforms to the gradation requirements in table 460-1. The values listed are design limits; production values may exceed those limits.

TABLE 460-1 AGGREGATE GRADATION MASTER RANGE AND VMA REQUIREMENTS

SIEVE	PERCENTS PASSING DESIGNATED SIEVES						
	NOMINAL SIZE						
	37.5 mm	25.0 mm	19.0 mm	12.5 mm	9.5 mm	SMA 12.5 mm	SMA 9.5 mm
50.0-mm	100						
37.5-mm	90 –100	100					
25.0-mm	90 max	90 -100	100				
19.0-mm	___	90 max	90 -100	100		100	
12.5-mm	___	___	90 max	90 -100	100	90 - 97	100
9.5-mm	___	___	___	90 max	90 -100	58 - 72	90 - 100
4.75-mm	___	___	___	___	90 max	25 - 35	35 - 45
2.36-mm	15 – 41	19 - 45	23 - 49	28 - 58	20 - 65	15 - 25	18 - 28
75-µm	0 – 6.0	1.0 - 7.0	2.0 - 8.0	2.0 - 10.0	2.0 - 10.0	8.0 - 12.0	10.0 - 14.0
% MINIMUM VMA	11.0	12.0	13.0	14.0[1]	15.0[2]	16.0	17.0

[1] 14.5 for E-3 mixes.

[2] 15.5 for E-3 mixes.

460.2.7 HMA Mixture Design

Replace paragraph one with the following effective with the January 2014 letting:

(1) For each HMA mixture type used under the contract, develop and submit an asphaltic mixture design according to the department's test method number 1559 as described in CMM 8-66 and conforming to the requirements of table 460-1 and table 460-2. The values listed are design limits; production values may exceed those limits. The department will review mixture designs and report the results of that review to the designer according to the department's test method number 1559.

TABLE 460-2 MIXTURE REQUIREMENTS

Mixture type	E - 0.3	E - 1	E - 3	E - 10	E - 30	E - 30x	SMA
ESALs x 10^6 (20 yr design life)	< 0.3	0.3 - < 1	1 - < 3	3 - < 10	10 - < 30	>= 30	___
LA Wear (AASHTO T96)							
100 revolutions(max % loss)	13	13	13	13	13	13	13
500 revolutions(max % loss)	50	50	45	45	45	45	40
Soundness (AASHTO T104) (sodium sulfate, max % loss)	12	12	12	12	12	12	12
Freeze/Thaw (AASHTO T103) (specified counties, max % loss)	18	18	18	18	18	18	18
Fractured Faces (ASTM 5821) (one face/2 face, % by count)	60 / __	65 / __	75 / 60	85 / 80	98 / 90	100/100	100/90
Flat & Elongated (ASTM D4791) (max %, by weight)	5 (5:1 ratio)	5 (5:1 ratio)	5 (5:1 ratio)	5 (5:1 ratio)	5 (5:1 ratio)	5 (5:1 ratio)	20 (3:1ratio)
Fine Aggregate Angularity (AASHTO T304, method A, min)	40	40	43	45	45	45	45
Sand Equivalency (AASHTO T176, min)	40	40	40	45	45	50	50
Gyratory Compaction							
Gyrations for N_{ini}	6	7	7	8	8	9	8
Gyrations for N_{des}	40	60	75	100	100	125	65
Gyrations for N_{max}	60	75	115	160	160	205	160
Air Voids, $\%V_a$ ($\%G_{mm}$ N_{des})	4.0 (96.0)	4.0 (96.0)	4.0 (96.0)	4.0 (96.0)	4.0 (96.0)	4.0 (96.0)	4.0 (96.0)
% G_{mm} N_{ini}	<= 91.5[1]	<= 90.5[1]	<= 89.0[1]	<= 89.0	<= 89.0	<= 89.0	___
% G_{mm} N_{max}	<= 98.0	<= 98.0	<= 98.0	<= 98.0	<= 98.0	<= 98.0	___
Dust to Binder Ratio[2] (% passing 0.075/P_{be})	0.6 - 1.2	0.6 - 1.2	0.6 - 1.2	0.6 - 1.2	0.6 - 1.2	0.6 - 1.2	1.2 - 2.0
Voids filled with Binder (VFB or VFA, %)	68 - 80[4] [5]	65 - 78[4]	65 - 75[3] [4]	65 - 75[3] [4]	65 - 75[3] [4]	65 - 75[3] [4]	70 - 80
Tensile Strength Ratio (TSR) (ASTM 4867)							
no antistripping additive	0.70	0.70	0.70	0.70	0.70	0.70	0.70
with antistripping additive	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Draindown at Production Temperature (%)	___	___	___	___	___	___	0.30

[1] The percent maximum density at initial compaction is only a guideline.

[2] For a gradation that passes below the boundaries of the caution zone(ref. AASHTO MP3), the dust to binder ratio limits are 0.6 - 1.6.

[3] For 9.5mm and 12.5 mm nominal maximum size mixtures, the specified VFB range is 70 - 76%.

[4] For 37.5mm nominal maximum size mixes, the specified VFB lower limit is 67%.

[5] For 25.0mm nominal maximum size mixes, the specified VFB lower limit is 67%.

460.2.8.2.1.5 Control Limits

Replace paragraph one with the following effective with the January 2014 letting:

(1) Conform to the following control limits for the JMF and warning limits based on a running average of the last 4 data points:

ITEM	JMF LIMITS	WARNING LIMITS
Percent passing given sieve:		
37.5-mm	+/- 6.0	+/- 4.5
25.0-mm	+/- 6.0	+/- 4.5
19.0-mm	+/- 5.5	+/- 4.0
12.5-mm	+/- 5.5	+/- 4.0
9.5-mm	+/- 5.5	+/- 4.0
2.36-mm	+/- 5.0	+/- 4.0
75-µm	+/- 2.0	+/- 1.5
Asphaltic content in percent	- 0.3	- 0.2
Air voids in percent	+/- 1.3	+/- 1.0
VMA in percent[1]	- 0.5	- 0.2

[1] VMA limits based on minimum requirement for mix design nominal maximum aggregate size in Table 460-1.

(2) Warning bands are defined as the area between the JMF limits and the warning limits.

460.2.8.2.1.6 Job Mix Formula Adjustment

Replace the entire text with the following effective with the January 2014 letting:

(1) The contractor may request adjustment of the JMF according to the department's test method number 1559. Have an HTCP HMA technician certified at a level appropriate for process control and troubleshooting or mix design submit a written JMF adjustment request. Ensure that the resulting JMF is within specified master gradation bands. The department will have an HMA technician certified at level III review the proposed adjustment and, if acceptable, issue a revised JMF.

(2) The department will not allow adjustments that do the following:

- Exceed specified JMF tolerance limits.
- Reduce the JMF asphalt content unless the production VMA running average meets or exceeds the minimum VMA design requirement defined in table 460-1for the mixture produced.

(3) Have an HMA technician certified at level II make related process adjustments. If mixture redesign is necessary, submit a new JMF, subject to the same specification requirements as the original JMF.

520.3.8 Protection After Laying

Delete the entire subsection.

614.2.1 General

Replace paragraphs five and six with the following effective with the December 2013 letting:

(5) Furnish zinc coated wire rope and fitting conforming to the plans and galvanized according to ASTM A741.

(6) Before installation store galvanized components above ground level and away from surface run off. The department may reject material if the zinc coating is physically damaged or oxidized.

(7) Provide manufacturer's drawings, and installation and maintenance instructions when providing proprietary systems.

614.2.3 Steel Rail and Fittings

Replace paragraph one with the following effective with the December 2013 letting:

(1) Furnish galvanized steel rail conforming to AASHTO M180 class A, type II beam using the single-spot test coating requirements. Furnish plates, anchor plates, post mounting brackets, and other structural steel components conforming to 506.2.2.1 and hot-dip galvanized according to ASTM A123.

614.2.7 Crash Cushions

Replace paragraph one with the following effective with the December 2013 letting:

(1) Furnish permanent and temporary crash cushions from the department's approved products list. Use cushions as wide or wider than the plan back-width. Furnish transitions conforming to the crash cushion manufacturer's design and specifications. Submit manufacturer crash cushion and transition design details to engineer before installing.

616.3.1 General

Replace paragraph six with the following effective with the December 2013 letting:

(6) Remove and dispose of all excess excavation and surplus materials from the fence site.

618.3.3 Restoration

Replace paragraph one with the following effective with the December 2013 letting:

(1) Upon termination of hauling operations and before conditional final acceptance, restore all haul roads, including drainage facilities and other components, to the equivalent of pre-hauling conditions.

627.3.1 General

Replace paragraph four with the following effective with the December 2013 letting:

(4) Maintain the mulched areas and repair all areas damaged by wind, erosion, traffic, fire or other causes.

637.3.2.1 General

Delete paragraph three effective with the December 2013 letting.

670.3.4.2 Post-Construction Work

Replace paragraph one with the following effective with the December 2013 letting:

(1) Submit 5 copies of ITS documentation including but not limited to the following:

- Operator's manual: for contractor furnished equipment, submit a manual containing detailed operating instructions for each different type or model of equipment and or operation performed.
- Maintenance procedures manuals: for contractor furnished equipment, submit a manual containing detailed preventive and corrective maintenance procedures for each type or model of equipment furnished.
- Cabinet fiber optic wiring diagram: submit a cabinet wiring diagram, identified by location for each cabinet. Include both electrical wiring and fiber optic conductor and cable connections. Place one copy of the fiber optic wiring diagram in a weatherproof holder in the cabinet. Deliver the other copies to the engineer.
- As-built drawings: submit final as-built drawings that detail the final placement of all conduit, cabling, equipment, and geometric modifications within the contract. Provide all documentation in an electronic format adhering to the region’s ITS computer aided drafting standards and according to the department’s as-built requirements. The department will review the as-built drawings for content and electronic format. Modify both the content and format of as-built drawings until meeting all requirements.
- Equipment inventory list: submit an inventory list including serial number, make, model, date installed, and location installed of all equipment installed under the contract.

Errata

Make the following corrections to the 2014 edition of the standard specifications:

415.3.14 Protecting Concrete

Correct errata by referencing the opening to service specification.

(1) Erect and maintain suitable barricades and, if necessary, provide personnel to keep traffic off the newly constructed pavement until it is opened for service as specified in 415.3.15. Conform to 104.6 for methods of handling and facilitating traffic.

501.2.9 Concrete Curing Materials

Correct errata by changing AASHTO M171 to ASTM C171.

(2) Furnish sheeting conforming to ASTM C171 for white opaque polyethylene film, except that the contractor may use clear or black polyethylene for cold weather protection.

607.2 Materials

Correct errata by changing AASHTO M198 to ASTM C990.

(1) Use materials conforming to the requirements for the class of material named and specified below.

Composite pipe, couplings, fittings and joint materials	ASTM D2680
Annular rubber and plastic gaskets for flexible, watertight joints	ASTM C990
External rubber gaskets, mastic, and protective film	ASTM C877
Mortar	519.2.3

637.2.1.3 Sheet Aluminum

Correct errata by changing ASTM B449 to B921 and eliminating the specification for coating thickness.

(4) Degrease, etch, and coat the sign blank on both sides with a chromate treatment conforming to ASTM B921, class 2.

637.3.3.4 Performance

Correct errata to reference to 105.11.2.3 as revised to implement changes to the finals process.

(1) Under 105.11.2.3 the department may revoke acceptance and direct the contractor to repair or replace previously accepted sign installations if the department subsequently discovers evidence of defective materials or improper installation. Deficiencies that warrant department action include but are not limited to the following:

- Sign posts more than five degrees out of plumb.
- Signs twisted by more than 5 degrees from plan orientation.
- Signs with delaminated or warped plywood.
- Signs with bubbling, fading, delaminating, or buckling sheeting.

646.3.3.4 Proving Period

Correct errata to reference to 105.11.2.3 as revised to implement changes to the finals process.

(4) Replace all marking within sections with a percent failing more than 10% and repair or replace all markings that, in the engineer's assessment, show evidence of improper construction. If post-acceptance inspections uncover evidence of defective materials or improper construction, the department may revoke acceptance under 105.11.2.3.

ADDITIONAL SPECIAL PROVISION 7

A. Reporting 1st Tier and DBE Payments During Construction

1. Comply with reporting requirements specified in the department's Civil Rights Compliance, Contractor's User Manual, Sublets and Payments.
2. Report payments to all DBE firms within 10 calendar days of receipt of a progress payment by the department or a contractor for work performed, materials furnished, or materials stockpiled by a DBE firm. Report the payment as specified in A(1) for all work satisfactorily performed and for all materials furnished or stockpiled.
3. Report payments to all first tier subcontractor relationships within 10 calendar days of receipt of a progress payment by the department for work performed. Report the payment as specified in A(1) for all work satisfactorily performed.
4. All tiers shall report payments as necessary to comply with the DBE payment requirement as specified in A(2).
5. Require all first tier relationships, DBE firms and all other tier relationships necessary to comply with the DBE payment requirement in receipt of a progress payment by contractor to acknowledge receipt of payment as specified in A(1), (2), (3) and (4).
6. All agreements made by a contractor shall include the provisions in A(1), (2), (3), (4) and (5), and shall be binding on all first tier subcontractor relationships and all contractors and subcontractors utilizing DBE firms on the project.

B. Costs for conforming to this special provision are incidental to the contract.

ADDITIONAL SPECIAL PROVISION 9
Electronic Certified Payroll Submittal

(1) Use the department's Civil Rights Compliance System (CRCS) to submit certified payrolls electronically. Details are available online through the department's highway construction contractor information (HCCI) site on the Labor, Wages, and EEO Information page at: http://www.dot.wi.gov/business/civilrights/laborwages/index.htm

(2) Ensure that all tiers of subcontractors, as well as all trucking firms, submit their weekly certified payrolls electronically through CRCS. These payrolls are due within seven calendar days following the close of the payroll period. Every firm providing physical labor towards completing the project is a subcontractor under this special provision.

(3) Upon receipt of contract execution, promptly make all affected firms aware of the requirements under this special provision and arrange for them to receive CRCS training as they are about to begin payrolls. The department will provide training either in a classroom setting at one of our regional offices or by telephone. Contact Tess Mulrooney at 608-267-4489 to schedule the training.

(4) The department will reject all paper submittals of forms DT-1816 and DT-1929 for information required under this special provision. All costs for conforming to this special provision are incidental to the contract.

(5) Firms wishing to export payroll data from their computer system into CRCS should have their payroll coordinator send several sample electronic files to Tess two months before a payroll needs to be submitted. Not every contractor's payroll system is capable of producing export files. For details, see pages 17-22 of the CRCS System Background Information manual available online on the Labor, Wages, and EEO Information page at: http://www.dot.wi.gov/business/civilrights/laborwages/docs/crc-payroll-manual.pdf

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

SEPTEMBER 2002

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Offeror's or Bidder's attention is called to the "Employment Practices" and "Equal Opportunity Clause" set forth in the Required Contract Provisions, FHWA 1273.

2. The goals and timetables for minority and female participation expressed in percentage terms for the contractor's aggregate work force in each trade, on all construction work in the covered area, are as follows:

Goals for Minority Participation for Each Trade:

County	%	County	%	County	%
Adams	1.7	Iowa	1.7	Polk	2.2
Ashland	1.2	Iron	1.2	Portage	0.6
Barron	0.6	Jackson	0.6	Price	0.6
Bayfield	1.2	Jefferson	7.0	Racine	8.4
Brown	1.3	Juneau	0.6	Richland	1.7
Buffalo	0.6	Kenosha	3.0	Rock	3.1
Burnett	2.2	Kewaunee	1.0	Rusk	0.6
Calumet	0.9	La Crosse	0.9	St. Croix	2.9
Chippewa	0.5	Lafayette	0.5	Sauk	1.7
Clark	0.6	Langlade	0.6	Sawyer	0.6
Columbia	1.7	Lincoln	0.6	Shawano	1.0
Crawford	0.5	Manitowoc	1.0	Sheboygan	7.0
Dane	2.2	Marathon	0.6	Taylor	0.6
Dodge	7.0	Marinette	1.0	Trempealeau	0.6
Door	1.0	Marquette	1.7	Vernon	0.6
Douglas	1.0	Menominee	1.0	Vilas	0.6
Dunn	0.6	Milwaukee	8.0	Walworth	7.0
Eau Claire	0.5	Monroe	0.6	Washburn	0.6
Florence	1.0	Oconto	1.0	Washington	8.0
Fond du Lac	1.0	Oneida	0.6	Waukesha	8.0
Forest	1.0	Outagamie	0.9	Waupaca	1.0
Grant	0.5	Ozaukee	8.0	Waushara	1.0
Green	1.7	Pepin	0.6	Winnebago	0.9
Green Lake	1.0	Pierce	2.2	Wood	0.6

Goals for female participation for each trade: 6.9%

These goals are applicable to all the contractor's construction work, (whether or not it is federal or federally assisted), performed in the covered area. If the contractor performs construction work in the geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The contractor's compliance with the Executive Order and the Regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the contractor's goals shall be a violation of the contract, the Executive Order and the Regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of $10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor, employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

   As referred to in this section, the Director means:

   Director
   Office of Federal Contract Compliance Programs
   Ruess Federal Plaza
   310 W. Wisconsin Ave., Suite 1115
   Milwaukee, WI 53202

   The "Employer Identification Number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

4. As used in this notice, and in the contract resulting from solicitation, the "covered area" is the county(ies) in Wisconsin to which this proposal applies.

APRIL 2013

ADDITIONAL FEDERAL-AID PROVISIONS

NOTICE TO ALL BIDDERS

To report bid rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., Eastern Time. Anyone with knowledge of possible bid rigging, bidding collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

DECEMBER 2013

BUY AMERICA PROVISION

All steel and iron materials permanently incorporated in this project shall be domestic products and all manufacturing and coating processes for these materials from smelting forward in the manufacturing process must have occurred within the United States. Coating includes epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of a material subject to the requirements of Buy America. The exemption of this requirement is the minimal use of foreign materials if the total cost of such material permanently incorporated in the product does not exceed one-tenth of one percent (1/10 of 1%) of the total contract cost or $2,500.00, whichever is greater. For purposes of this paragraph, the cost is that shown to be the value of the subject products as they are delivered to the project. The contractor shall take actions and provide documentation conforming to CMM 2-28.5 to ensure compliance with this “Buy America” provision.

http://roadwaystandards.dot.wi.gov/standards/cmm/cm-02-28.pdf#cm2-28.5

Upon completion of the project certify to the engineer, in writing using department form WS4567, that all steel, iron, and coating processes for steel or iron incorporated into the contract work conform to these "Buy America" provisions. Attach a list of exemptions and their associated costs to the certification form. Department form WS4567 is available at:

http://roadwaystandards.dot.wi.gov/standards/forms/ws4567.doc

Effective with September 2004 Letting

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS AND TRANSPORTATION FACILITIES

SUPPLEMENTAL REQUIRED CONTRACT PROVISIONS

I. Wage Rates, Hours of labor and payment of Wages
II. Payroll Requirements
III. Postings at the Site of the Work
IV. Affidavits
V. Wage Rate Redistribution
VI. Additional Classifications

I. WAGE RATES, HOURS OF LABOR AND PAYMENT OF WAGES

The schedule of "Minimum Wage Rates" attached hereto and made a part hereof furnishes the prevailing wage rates that have been determined pursuant to Section 103.50 of the Wisconsin Statutes. These wage rates are the minimum required to be paid to the various laborers, workers, mechanics and truck drivers employed by contractors and subcontractors on the construction work embraced by the contract and subject to prevailing hours and wages under Section 103.50, Stats. If necessary to employ laborers, workers, mechanics or truck drivers whose classification is not listed on the schedule, they shall be paid at rates conformable to those listed for similar classifications. Apprentices shall be paid at rates not less than those prescribed in their state indenture contacts.

While the wage rates shown are the minimum rates required by the contract to be paid during its life, this in not a representation that labor can be obtained at these rates. It is the responsibility of bidders to inform themselves as to the local labor conditions and prospective changes or adjustments of wage rates. No increase in the contract price shall be allowed or authorized on account of the payment of wage rates in excess of those listed herein.

Pursuant to Section 103.50 of the Wisconsin Statutes, the prevailing hours of labor have been determined to be up to 10 hours per day and 40 hours per calendar week Monday through Friday. If any laborer, worker, mechanic or truck driver is permitted or required to work more than the prevailing number of hours per day or per calendar week on this contract, they shall be paid for all hours in excess of the prevailing hours at a rate of at least one and one-half (1 1/2) times their hourly rate of pay. All work on Saturday, Sunday and the following holidays is to be paid at time and a half: (1) January 1, (2) the last Monday in May, (3) July 4, (4) the first Monday in September, (5) the fourth Thursday in November, (6) December 25, (7) the day before if January 1, July 4 or December 25 falls on a Saturday and (8) the day following if January 1, July 4 or December 25 falls on a Sunday.

All laborers, workers, mechanics and truck drivers shall be paid unconditionally not less often than once a week. Persons who own and operate their own trucks must receive the prevailing truck driver rate for the applicable type of truck (i.e. 2 axle, 3 or more axle, articulated, eculid or dumptor) he or she operates, plus an agreed upon amount for the use of his or her truck. Every owner-operator MUST be paid separately for their driving and for the use of their truck.

For those projects subject to the requirements of the Davis-Bacon Act, the Secretary of Labor will also have determined "Minimum Wage Rates" for work to be performed under the contract. These rates are, for all or most of the labor, worker, mechanic or truck driver classifications, identical to those established under Section 103.50 of the Wisconsin Statutes. In the event the rates are not identical, the higher of the two rates will govern.

II. PAYROLL REQUIREMENTS

All contractors and subcontractors must submit weekly Certified Payrolls and Compliance Statement verifying that all laborers, workers, mechanics and truck drivers working on the project have been paid the prevailing wage rates for all work performed under the contract required by Section 103.50 of the Wisconsin Statutes.

III. POSTINGS AT THE SITE OF THE WORK

In addition to the required postings furnished by the Department, the contractor shall post the following in at least one conspicuous place at the site of work:

a. "NOTICE TO EMPLOYEES," which provides information required to be posted by the provisions of Section 103.50 of the Wisconsin Statutes.

b. A copy of the State of Wisconsin Minimum Wages Rates. (Four pages.)

c. A copy of the contractor's Equal Employment Opportunity Policy.

d. On any project involving federal aid, in addition to the furnished postings, the contractor shall post a copy of the "Davis-Bacon Act, Minimum Wage Rates". (Three pages.)

IV. WAGE RATE REDISTRIBUTION

The amount specified as the hourly basic rate of pay and the amount(s) specified as the fringe benefit contribution(s), for all classes of laborers, workers, mechanics or truck drivers may be redistributed, when necessary, to conform to those specified in any applicable collective bargaining agreement, provided that both parties to such agreement

request and receive the approval for any such redistribution from both the Department of Transportation and the Department of Workforce Development prior to the implementation of such redistribution.

V. ADDITIONAL CLASSIFICATIONS

Any unlisted laborer or mechanic classification that is needed to perform work on this project, and is not included within the scope of any of the classifications listed in the application prevailing wage rate determination, may be added after award only if all of the following criteria have been met:

1. The affected employer(s) must make a written request to WisDOT Central Office to utilize the unlisted classification on this project.

2. The request must indicate the scope of the work to be performed by the unlisted classification and must indicate the proposed wage/fringe benefit package that the unlisted classification is to receive.

3. The work to be performed by the unlisted classification must not be performed by a classification that is included in the applicable prevailing wage rate determination.

4. The unlisted classification must be commonly employed in the area where the project is located.

5. The proposed wage/fringe benefit package must bear a reasonable relationship to those set forth in the applicable prevailing wage rate determination.

6. The request should be made prior to the actual performance of the work by the unlisted classification.

7. DWD must approve the use of the unlisted classification and the proposed wage/fringe benefit package. USDOL also must approve the use of the unlisted classification and the proposed wage/fringe benefit package on federal aid projects.

8. WisDOT and DWD may amend the proposed wage/fringe benefit package, as deemed necessary, and may set forth specific employment ratios and scope of work requirements in the approval document.

The approved wage/fringe benefit package shall be paid to all laborers, workers, mechanics or truck drivers performing work within the scope of that performed by the unlisted classification, from the first day on which such work is performed. In the event that work is performed by the unlisted classification prior to approval, the wage/fringe benefit package to be paid for such work must be in conformance with the wage/fringe

benefit package approved for such work. Under this arrangement a retroactive adjustment in wages and/or fringe benefits may be required to be made to the affected laborers, workers, mechanics or truck drivers by the affected employer(s).

ANNUAL PREVAILING WAGE RATE DETERMINATION
FOR ALL STATE HIGHWAY PROJECTS
MILWAUKEE COUNTY

Compiled by the State of Wisconsin - Department of Workforce Development
for the Department of Transportation
Pursuant to s. 103.50, Stats.
Issued on May 1, 2014

CLASSIFICATION: Contractors are required to call the Department of Workforce Development if there are any questions reqarding the proper trade or classification to be used for any worker on a public works project.

OVERTIME: Time and one-half must be paid for all hours worked over 10 hours per day and 40 hours per calendar week and for all hours worked on Saturday, Sunday and the following six (6) holidays: January 1; the last Monday in May; July 4; the 1st Monday in September; the 4th Thursday in November; December 25; the day before if January 1, July 4 or December 25 falls on a Saturday; the day following if January 1, July 4 or December 25 falls on a Sunday.

FUTURE INCREASE: If indicated for a specific trade or occupation, the full amount of such increase MUST be added to the "TOTAL" indicated for such trade or occupation on the date(s) such increase(s) becomes effective.

PREMIUM PAY: If indicated for a specific trade or occupation, the full amount of such pay MUST be added to the "HOURLY BASIC RATE OF PAY" indicated for such trade or occupation, whenever such pay is applicable.

SUBJOURNEY: Wage rates may be available for some of the classifications indicated below. Any employer that desires to use any subjourney classification on a project MUST request the applicable wage rate from the Department of Workforce Development PRIOR to the date such classification is used on such project. Form ERD-10880 is available for this purpose and can be obtained by writing to the Department of Workforce Development, Equal Rights Division, P.O. Box 8928, Madison, WI 53708.

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	$	$	$
Bricklayer, Blocklayer or Stonemason	35.80	16.87	52.67
Carpenter	33.68	19.81	53.49
Future Increase(s): Add $1.25/hr on 6/2/2014.			
Premium Pay: DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.			
Cement Finisher	31.56	18.53	50.09
Future Increase(s): Add $1.87 on 6/1/14; Add $1.87 on 6/1/15; Add $1.75 on 6/1/16.			
Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.40/hr when the Wisconsin Department of Transportation or responsible governing agency requires that work be performed at night under artificial illumination with traffic control and the work is completed after sunset and before sunrise.			
Electrician	32.82	22.61	55.43
Premium Pay: DOT PREMIUM: Pay two times the hourly basic rate on Sunday, New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day.			
Fence Erector	16.00	3.33	19.33
Ironworker	30.51	23.23	53.74
Line Constructor (Electrical)	38.25	17.63	55.88
Painter	21.87	11.37	33.24
Pavement Marking Operator	30.00	0.00	30.00
Piledriver	27.67	25.64	53.31
Roofer or Waterproofer	29.40	15.55	44.95
Teledata Technician or Installer	24.75	16.08	40.83
Tuckpointer, Caulker or Cleaner	34.57	16.42	50.99
Underwater Diver (Except on Great Lakes)	34.48	15.90	50.38
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	34.43	15.24	49.67

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	$	$	$
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	30.60	15.07	45.67
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	26.78	13.58	40.36
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	24.86	12.97	37.83
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.04	11.74	32.78
TRUCK DRIVERS			
Single Axle or Two Axle	34.22	19.90	54.12
Three or More Axle	25.24	15.20	40.44
Articulated, Euclid, Dumptor, Off Road Material Hauler	29.27	20.40	49.67
Future Increase(s): Add $1.75/hr on 6/1/14); Add $1.25/hr on 6/1/15); Add $1.30/hr on 6/1/16); Add $1.25/hr on 6/ 1/ 17. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:/ / www.dot.wi.gov/ business/ civilrights/ laborwages/ pwc. htm.			
Pavement Marking Vehicle	25.24	15.20	40.44
Shadow or Pilot Vehicle	34.22	19.90	54.12
Truck Mechanic	25.24	15.20	40.44
LABORERS			
General Laborer	26.06	19.43	45.49
Future Increase(s): Add $1.60/hr on 6/1/2014. Premium Pay: Add $.15/hr for air tool operator, joint sawer and filler (pavement), vibrator or tamper operator (mechanical hand operated), chain saw operator and demolition burning torch laborer; Add $.35/hr for bituminous worker (raker and luteman), formsetter (curb, sidewalk and pavement) and strike off man; Add $.50/hr for line and grade specialist; Add $.65/hr for blaster and powderman; Add $2.01/hr for topman; Add $2.46/hr for bottomman; Add $3.23/hr for pipelayer. / DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).			
Asbestos Abatement Worker	19.00	0.00	19.00
Landscaper	26.06	19.43	45.49
Future Increase(s): Add $1.60/hr on 6/1/14. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.25/hr for work on projects involving temporary traffic control setup, for lane and shoulder closures, when work under artificial illumination conditions is necessary as required by the project provisions (including prep time prior to and/or cleanup after such time period).			
Flagperson or Traffic Control Person	22.55	19.43	41.98
Future Increase(s): Add $1.60/hr on 6/1/2014. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.25/hr when the Wisconsin Department of Transportation or responsible governing agency requires that work be performed at night under artificial illumination with traffic control and the work is completed after sunset and before sunrise.			
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.69	15.50	33.19
Railroad Track Laborer	13.50	4.06	17.56

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
HEAVY EQUIPMENT OPERATORS			
Crane, Tower Crane, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 176 Ft or Over; Crane, Tower Crane, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons, Self-Erecting Tower Crane With a Lifting Capacity Of Over 4,000 Lbs., Crane With Boom Dollies; Traveling Crane (Bridge Type). Future Increase(s): Add $1.75/hr on 6/1/2014); Add $1.25/hr on 6/1/2015); Add $1.30/hr on 6/1/2016); Add $1.25/hr on 6/ 1/ 2017. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:/ / www.dot.wi.gov/ business/ civilrights/ laborwages/ pwc. htm.	36.72	20.40	57.12
Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With Boom, Leads &/or Jib Lengths Measuring 175 Ft or Under; Crane, Tower Crane, Portable Tower, Pedestal Tower or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under, Self-Erecting Tower Crane With A Lifting Capacity Of 4,000 Lbs., & Under; Dredge (NOT Performing Work on the Great Lakes); Licensed Boat Pilot (NOT Performing Work on the Great Lakes); Pile Driver. Future Increase(s): Add $1.75/hr on 6/1/2014); Add $1.25/hr on 6/1/2015); Add $1.30/hr on 6/1/2016); Add $1.25/hr on 6/ 1/ 2017. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:/ / www.dot.wi.gov/ business/ civilrights/ laborwages/ pwc. htm.	36.22	20.40	56.62
Air Track, Rotary or Percussion Drilling Machine &/or Hammers, Blaster; Asphalt Heater, Planer & Scarifier; Asphalt Milling Machine; Asphalt Screed; Automatic Subgrader (Concrete); Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs., Backhoe (Mini, 15,000 Lbs. & Under); Bituminous (Asphalt) Plant & Paver, Screed; Boatmen (NOT Performing Work on the Great Lakes); Boring Machine (Directional, Horizontal or Vertical); Bridge (Bidwell) Paver; Bulldozer or Endloader; Concrete Batch Plant, Batch Hopper; Concrete Breaker (Large, Auto, VIbratory/Sonic, Manual or Remote); Concrete Bump Cutter, Grinder, Planing or Grooving Machine; Concrete Conveyor System; Concrete Laser/Screed; Concrete Paver (Slipform); Concrete Pump, Concrete Conveyor (Rotec or Bidwell Type); Concrete Slipform Placer Curb & Gutter Machine; Concrete Spreader & Distributor; Crane (Carry Deck, Mini) or Truck Mounted Hydraulic Crane (10 Tons or Under); Crane WIth a Lifting Capacity of 25 Tons or Under; Forestry Equipment, Timbco, Tree Shear, Tub Grinder, Processor; Gradall (Cruz-Aire Type); Grader or Motor Patrol; Grout Pump; Hydro-Blaster (10,000 PSI or Over); Loading Machine (Conveyor); Material or Stack Hoist; Mechanic or Welder; Milling Machine; Post Hole Digger or Driver; Roller (Over 5 Ton); Scraper (Self Propelled or Tractor Drawn) 5 cu yds or More Capacity; Shoulder Widener; Sideboom; Skid Rig; Stabilizing or Concrete Mixer (Self-Propelled or 14S or Over); Straddle Carrier or Travel Lift; Tractor (Scraper, Dozer, Pusher, Loader); Tractor or Truck Mounted Hydraulic Backhoe; Trencher (Wheel Type or Chain Type); Tube Finisher; Tugger (NOT Performing Work on the Great Lakes); Winches	35.72	20.40	56.12

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
& A- Frames. Future Increase(s): Add $1.75/hr on 6/1/2014); Add $1.25/hr on 6/1/2015); Add $1.30/hr on 6/1/2016); Add $1.25/hr on 6/ 1/ 2017. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:/ / www.dot.wi.gov/ business/ civilrights/ laborwages/ pwc. htm.			
Belting, Burlap, Texturing Machine; Broom or Sweeper; Compactor (Self-Propelled or Tractor Mounted, Towed & Light Equipment); Concrete Finishing Machine (Road Type); Environmental Burner; Farm or Industrial Type Tractor; Fireman (Asphalt Plant, Pile Driver & Derrick NOT Performing Work on the Great Lakes); Forklift; Greaser; Hoist (Tugger, Automatic); Jeep Digger; Joint Sawer (Multiple Blade); Launch (NOT Performing Work on the Great Lakes); Lift Slab Machine; Mechanical Float; Mulcher; Power Subgrader; Robotic Tool Carrier (With or Without Attachments); Roller (Rubber Tire, 5 Ton or Under); Self Propelled Chip Spreader; Shouldering Machine; Skid Steer Loader (With or WIthout Attachments); Telehandler; Tining or Curing Machine. Future Increase(s): Add $1.75/hr on 6/1/2014); Add $1.25/hr on 6/1/2015); Add $1.30/hr on 6/1/2016); Add $1.25/hr on 6/ 1/ 2017. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:/ / www.dot.wi.gov/ business/ civilrights/ laborwages/ pwc. htm.	35.46	20.40	55.86
Air Compressor (&/or 400 CFM or Over); Air, Electric or Hydraulic Jacking System; Augers (Vertical & Horizontal); Automatic Belt Conveyor & Surge Bin; Boiler (Temporary Heat); Concrete Proportioning Plant; Crusher, Screening or Wash Plant; Generator (&/or 150 KW or Over); Heaters (Mechanical); High Pressure Utility Locating Machine (Daylighting Machine); Mudjack; Oiler; Prestress Machine; Pug Mill; Pump (3 Inch or Over) or Well Points; Rock, Stone Breaker; Screed (Milling Machine); Stump Chipper; Tank Car Heaters; Vibratory Hammer or Extractor, Power Pack. Future Increase(s): Add $1.75/hr on 6/1/2014); Add $1.25/hr on 6/1/2015); Add $1.30/hr on 6/1/2016); Add $1.25/hr on 6/ 1/ 2017. Premium Pay: DOT PREMIUMS: 1) Pay two times the hourly basic rate on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day & Christmas Day. 2) Add $1.50/hr night work premium. See DOT'S website for details about the applicability of this night work premium at: http:/ / www.dot.wi.gov/ business/ civilrights/ laborwages/ pwc. htm.	35.17	20.40	55.57
Fiber Optic Cable Equipment.	26.69	16.65	43.34
Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	38.80	20.17	58.97
Work Performed on the Great Lakes Including 70 Ton & Over Tug Operator; Assistant Hydraulic Dredge Engineer; Crane or Backhoe Operator; Hydraulic Dredge Leverman or Diver's Tender; Mechanic or Welder.	38.80	20.17	58.97
Work Performed on the Great Lakes Including Deck Equipment Operator or Machineryman (Maintains Cranes Over 50 Tons or Backhoes 115,000 Lbs. or More); Tug, Launch or Loader, Dozer or Like Equipment When Operated on a Barge, Breakwater Wall, Slip, Dock or Scow, Deck Machinery.	34.50	20.04	54.54
Work Performed on the Great Lakes Including Deck Equipment Operator, Machineryman or Fireman (Operates 4 Units or More or Maintains Cranes 50 Tons or Under or Backhoes 115,000 Lbs. or Under); Deck Hand, Deck Engineer or Assistant Tug Operator; Off Road Trucks-Great Lakes ONLY.	34.50	20.04	54.54

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	$	$	$

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: June 27, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence and Bridge Builder; Landscaper, Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, Utility Man); Batch Truck Dumper; or Cement Handler; Bituminous Worker; (Dumper, Ironer, Smoother, Tamper); Concrete Handler	$26.06	18.15
Group 2: Air Tool Operator; Joint Sawer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer	26.21	18.15
Group 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off man	26.41	18.15
Group 4: Line and Grade Specialist	26.56	18.15
Group 5: Blaster and Powderman	26.71	18.15
Group 6: Flagperson traffic control person	22.55	18.15

CLASSES OF LABORER AND MECHANICS

Bricklayer	35.37	18.47
Carpenter	30.52	14.41
Piledriverman	27.25	19.46
Ironworker	30.52	23.47
Cement Mason/Concrete Finisher	30.69	17.53
Electrician		See Page 3
Line Construction		
Lineman	39.50	32% + 5.00
Heavy Equipment Operator	37.53	32% + 5.00
Equipment Operator	31.60	32% + 5.00
Heavy Groundman Driver	26.78	14.11
Light Groundman Driver	24.86	13.45
Groundsman	21.73	32% + 5.00
Millwrights	26.32	13.98
Painter, Brush	29.52	20.04
Painter, Spray and Sandblaster	30.27	20.04
Painter, Bridge	29.87	20.04
Well Drilling:		
Well Driller	16.52	3.70

	Basic Hourly Rates	Fringe Benefits
Truck Drivers:		
1 & 2 Axles	25.18	18.31
Three or More Axles; Euclids, Dumptor & Articulated, Truck Mechanic	25.38	18.31

Notes: Welders receive rate prescribed for craft performing operation to which welding is incidental. Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR, 5.5(a)(1)(ii)). Includes Modification #0, dated January 3, 2014; Modification #1, dated February 7, 2014; Modification #2, dated March 14, 2014; Modification #3, dated May 2, 2014; Modification #4, dated June 27, 2014.

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: May 2, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

POWER EQUIPMENT OPERATORS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of over 100 tons or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 176 feet or longer	$36.72	$20.10
Group 2: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of 100 tons or less or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 175 feet or less, and backhoes (excavators) having a manufacturer's rated capacity of 3 cu. yds. and over, caisson rigs, pile driver, dredge operator, dredge engineer.	$36.22	$20.10
Group 3: Mechanic or welder - heavy duty equipment, cranes with a lifting capacity of 25 tons or less, concrete breaker (manual or remote); vibrator/sonic concrete breaker; concrete laser screed; concrete slipform paver; concrete batch plant operator; concrete pavement spreader - heavy duty (rubber tired); concrete spreader and distributor, automatic subgrader (concrete); concrete grinder and planing machine; concrete slipform curb and gutter machine; slipform concrete placer; tube finisher; hydro blaster (10,000 psi and over); bridge paver; concrete conveyor system; concrete pump; stabilizing mixer (self propelled); shoulder widener; asphalt plant engineer; bituminous paver; bump cutter and grooving machine; milling machine; screed (bituminous paver); asphalt heater, planer and scarifier; backhoes (excavators) having a manufacturers rated capacity of under 3 cu. yds.; grader or motor patrol; tractor		

POWER EQUIPMENT OPERATORS CLASSIFICATION: (Continued)	Basic Hourly Rates	Fringe Benefits
(scraper, dozer, pusher, loader); scraper - rubber tired (single or twin engine); endloader hydraulic backhoe (tractor-type); trenching machine; skid rigs; tractor, side boom (heavy); drilling or boring machine (mechanical heavy); roller (over 5 tons); percussion or rotary drilling machine; air track; blaster; loading machine (conveyor); tugger; boatmen; winches and A-frames; post driver; material hoist operator.	$35.72	$20.10
Group 4: Greaser, roller steel (5 tons or less); roller (pneumatic tired) - self-propelled; tractor (mounted or towed compactors and light equipment); shouldering machine; self-propelled chip spreader; concrete spreader; finishing machine; mechanical float; curing machine; power subgrader; joint saw (multiple blade) belting machine; burlap machine; texturing machine; tractor, endloader (rubber tired) - light; jeep digger; fork lift; mulcher; launch operator; fireman; environmental burner.	$35.46	$20.10
Group 5: Air compressor; power pack; vibratory hammer and extractor; heavy equipment, leadman; tank car heaters; stump chipper; curb machine operator; concrete pro-portioning plants generators; mudjack operator; rock breaker; crusher or screening plant; screed (milling machine); automatic belt conveyor and surge bin; pug mill operator; oiler; pump (over 3 inches); drilling machine helper.	$35.17	$20.10
Group 6: Off – road material hauler with or without ejector	$29.27	$20.10

Premium Pay:
EPA Level "A" protection - $3.00 per hour
EPA Level "B" protection - $2.00 per hour
EPA Level "C" protection - $1.00 per hours

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: May 2, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Rates	Benefits
Electricians		
Area 1	$28.40	16.676
Area 2:		
Electricians	29.13	17.92
Area 3:		
Electrical contracts under $130,000	26.24	16.85
Electrical contracts over $130,000	29.41	16.97
Area 4:	28.50	28.75% + 9.27
Area 5	28.96	24.85% + 9.70
Area 6	35.25	19.30
Area 8		
Electricians	30.60	24.95% + 10.33
Area 9:		
Electricians	32.94	18.71
Area 10	28.97	20.45
Area 11	31.91	23.60
Area 12	32.87	19.23
Area 13	32.82	22.51
Teledata System Installer		
Area 14		
Installer/Technician	21.89	11.83
Sound & Communications		
Area 15		
Installer	16.47	14.84
Technician	24.75	16.04

Area 1 - CALUMET (except township of New Holstein), GREEN LAKE (N. part, including Townships of Berlin, St. Marie and Seneca), MARQUETTE (N. part, including Townships of Crystal Lake, Neshkoro, Newton & Springfield), OUTAGAMIE, WAUPACA, WAUSHARA and WINNEBAGO COUNTIES.

Area 2 - ASHLAND, BARRON, BAYFIELD, BUFFALO, BURNETT, CHIPPEWA, CLARK (except Mayville, Colby, Unity, Sherman, Fremont, Lynn and Sherwood), CRAWFORD, DUNN, EAU CLAIRE, GRANT, IRON, JACKSON, LA CROSSE, MONROE, PEPIN, PIERCE, POLK, PRICE, RICHLAND, RUSK, ST. CROIX, SAWYER, TAYLOR, TREMPEALEAU, VERNON and WASHBURN COUNTIES

Area 3 - FLORENCE (townships of Aurora, Commonwealth, Fern, Florence and Homestead), MARINETTE (Niagara township)

Area 4 - BROWN, DOOR, KEWAUNEE, MANITOWOC (except Schleswig), MARINETTE (Wausauke and area south thereof), OCONTO, MENOMINEE (East of a line 6 miles West of the West boundary of Oconto County), SHAWANO (except area North of Townships of Aniwa and Hutchins) COUNTIES.

Area 5 - ADAMS, CLARK (Colby, Freemont, Lynn, Mayville, Sherman, Sherwood, Unity), FOREST, JUNEAU, LANGLADE, LINCOLN, MARATHON, MARINETTE (Area North of the town of Wausaukee), MENOMINEE (Area West of a line 6 miles West of the West boundary of Oconto County), ONEIDA, PORTAGE, SHAWANO (Area North of the townships of Aniwa and Hutchins), VILAS AND WOOD COUNTIES

Area 6 - KENOSHA COUNTY

Area 8 - DODGE, (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE, RACINE (Burlington township), ROCK and WALWORTH COUNTIES

Area 9 - COLUMBIA, DANE, DODGE, (area west of Hwy. 26, except Chester & Emmet Townships), GREEN LAKE (except townships of Berlin, Seneca and St. Marie), IOWA, MARQUETTE (except townships of Neshkoka, Crystal Lake, Newton and Springfield), and SAUK COUNTIES

Area 10 - CALUMET (Township of New Holstein), DODGE (East of Hwy. 26 including Chester Township), FOND DU LAC, MANITOWOC (Schleswig), and SHEBOYGAN COUNTIES

Area 11 - DOUGLAS COUNTY

Area 12 - RACINE (except Burlington township) COUNTY

Area 13 - MILWAUKEE, OZAUKEE, WASHINGTON and WAUKESHA COUNTIES

Area 14 - Statewide.

Area 15 - DODGE (East of Hwy 26 including Chester Twp, excluding Emmet Twp), FOND DU LAC (Except Waupun), MILWAUKEE, OZAUKEE, MANITOWOC (Schleswig), WASHINGTON, AND WAUKESHA COUNTIES.

FEBRUARY 1999

NOTICE TO BIDDERS
WAGE RATE DECISION

The wage rate decision of the Secretary of Labor which has been incorporated in these advertised specifications is incomplete in that the classifications may be omitted from the Secretary of Labor's decision.

Since the bidder is responsible, independently, for ascertaining area practice with respect to the necessity, or lack of necessity, for the use of these classifications in the prosecution of the work contemplated by this project, no inference may be drawn from the omision of these classifications concerning prevailing area practices relative to their use. Further, this omission will not, per se, be construed as establishing any governmental liability for increased labor cost if it is subsequently determined that such classifications are required.

There may be omissions and/or errors in the federal wage rates. The bidder is responsible for evaluating and determining the correct applicable rate. The higher of state or federal rate will apply.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SECTION 0001 ROADWAY ITEMS					
0005	108.3100.S INCENTIVE/DISINCENTIVE FOR INTERIM COMPLETION OF WORK	0.100 CD		.		.
0010	201.0105 CLEARING	269.000 STA		.		.
0015	201.0120 CLEARING	1,211.000 ID		.		.
0020	201.0205 GRUBBING	269.000 STA		.		.
0025	201.0220 GRUBBING	1,211.000 ID		.		.
0030	203.0200 REMOVING OLD STRUCTURE (STATION) 0001. 280+00 NS	LUMP	LUMP			.
0035	203.0200 REMOVING OLD STRUCTURE (STATION) 0002. 586SW+76.79	LUMP	LUMP			.
0040	203.0200 REMOVING OLD STRUCTURE (STATION) 0003. 590SW+89.63	LUMP	LUMP			.
0045	203.0200 REMOVING OLD STRUCTURE (STATION) 0004. 591SW+15.01	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0050	203.0200 REMOVING OLD STRUCTURE (STATION) 0005. 64+02.9	LUMP	LUMP			.
0055	203.0200 REMOVING OLD STRUCTURE (STATION) 0006. 237+50	LUMP	LUMP			.
0060	203.0200 REMOVING OLD STRUCTURE (STATION) 0007. 237+60	LUMP	LUMP			.
0065	203.0200 REMOVING OLD STRUCTURE (STATION) 0008. 196+88	LUMP	LUMP			.
0070	203.0200 REMOVING OLD STRUCTURE (STATION) 0009. 197+06	LUMP	LUMP			.
0075	203.0200 REMOVING OLD STRUCTURE (STATION) 0010. 201+60	LUMP	LUMP			.
0080	203.0200 REMOVING OLD STRUCTURE (STATION) 0011. 572SA+25	LUMP	LUMP			.
0085	203.0200 REMOVING OLD STRUCTURE (STATION) 0012. 559SA+50	LUMP	LUMP			.
0090	203.0200 REMOVING OLD STRUCTURE (STATION) 0013. 26+25.00	LUMP	LUMP			.
0095	203.0200 REMOVING OLD STRUCTURE (STATION) 0014. 587SW+01.22	LUMP	LUMP			.
0100	203.0200 REMOVING OLD STRUCTURE (STATION) 0015. 2FCV+72	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0105	203.0200 REMOVING OLD STRUCTURE (STATION) 0016. 233EW+84	LUMP	LUMP			.
0110	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0001. B-40-88	LUMP	LUMP			.
0115	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0002. B-40-90	LUMP	LUMP			.
0120	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0003. B-40-91	LUMP	LUMP			.
0125	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0004. B-40-92	LUMP	LUMP			.
0130	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0005. B-40-0093	LUMP	LUMP			.
0135	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0006. B-40-95	LUMP	LUMP			.
0140	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0007. B-40-98	LUMP	LUMP			.
0145	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0008. B-40-99	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0150	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0009. B-40-106	LUMP	LUMP			.
0155	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0010. B-40-129	LUMP	LUMP			.
0160	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0011. B-40-130	LUMP	LUMP			.
0165	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0012. B-40-131	LUMP	LUMP			.
0170	204.0100 REMOVING PAVEMENT **P**	289,685.000 SY		.		.
0175	204.0109.S REMOVING CONCRETE SURFACE PARTIAL DEPTH **P**	14,097.000 SF		.		.
0180	204.0110 REMOVING ASPHALTIC SURFACE **P**	13,409.000 SY		.		.
0185	204.0125 REMOVING ASPHALTIC SURFACE MILLING	642.000 TON		.		.
0190	204.0150 REMOVING CURB & GUTTER **P**	9,465.000 LF		.		.
0195	204.0155 REMOVING CONCRETE SIDEWALK **P**	9,719.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0200	204.0157 REMOVING CONCRETE BARRIER **P**	41,483.000 LF		.		.
0205	204.0165 REMOVING GUARDRAIL **P**	4,064.000 LF		.		.
0210	204.0170 REMOVING FENCE **P**	28,757.000 LF		.		.
0215	204.0195 REMOVING CONCRETE BASES	194.000 EACH		.		.
0220	204.0210 REMOVING MANHOLES	137.000 EACH		.		.
0225	204.0220 REMOVING INLETS	535.000 EACH		.		.
0230	204.0245 REMOVING STORM SEWER (SIZE) 0001. 12-INCH **P**	21,289.000 LF		.		.
0235	204.0245 REMOVING STORM SEWER (SIZE) 0002. 15-INCH **P**	2,052.000 LF		.		.
0240	204.0245 REMOVING STORM SEWER (SIZE) 0003. 18-INCH **P**	1,912.000 LF		.		.
0245	204.0245 REMOVING STORM SEWER (SIZE) 0004. 21-INCH **P**	286.000 LF		.		.
0250	204.0245 REMOVING STORM SEWER (SIZE) 0005. 24-INCH **P**	921.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0255	204.0245 REMOVING STORM SEWER (SIZE) 0006. 30-INCH **P**	414.000 LF		.		.
0260	204.0245 REMOVING STORM SEWER (SIZE) 0007. 36-INCH **P**	439.000 LF		.		.
0265	204.0245 REMOVING STORM SEWER (SIZE) 0008. 42-INCH **P**	3,219.000 LF		.		.
0270	204.0245 REMOVING STORM SEWER (SIZE) 0009. 48-INCH **P**	2,181.000 LF		.		.
0275	204.0245 REMOVING STORM SEWER (SIZE) 0010. 54-INCH **P**	668.000 LF		.		.
0280	204.0245 REMOVING STORM SEWER (SIZE) 0013. 72-INCH **P**	225.000 LF		.		.
0285	204.0245 REMOVING STORM SEWER (SIZE) 0100. 8-INCH **P**	135.000 LF		.		.
0290	204.0280 SEALING PIPES	121.000 EACH		.		.
0295	204.9060.S REMOVING (ITEM DESCRIPTION) 0001. CRASH BARRELS	2.000 EACH		.		.
0300	204.9060.S REMOVING (ITEM DESCRIPTION) 0002. APRON ENDWALL	1.000 EACH		.		.
0305	204.9090.S REMOVING (ITEM DESCRIPTION) 0001. NOISE BARRIER **P**	1,895.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0310	204.9090.S REMOVING (ITEM DESCRIPTION) 0002. RETAINING WALL **P**	959.000 LF		.		.
0315	204.9090.S REMOVING (ITEM DESCRIPTION) 0003. DECORATIVE FENCE **P**	58.000 LF		.		.
0320	204.9090.S REMOVING (ITEM DESCRIPTION) 0005. DRAIN SLOTTED VANE **P**	917.000 LF		.		.
0325	205.0100 EXCAVATION COMMON **P**	948,814.000 CY		.		.
0330	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0001. B-40-537	LUMP	LUMP			.
0335	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0002. B-40-538	LUMP	LUMP			.
0340	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0003. B-40-789	LUMP	LUMP			.
0345	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0004. B-40-791	LUMP	LUMP			.
0350	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0005. B-40-798	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0355	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0006. B-40-849	LUMP	LUMP			.
0360	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0007. B-40-852	LUMP	LUMP			.
0365	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0009. B-40-857	LUMP	LUMP			.
0370	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0010. B-40-862	LUMP	LUMP			.
0375	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0011. B-40-863	LUMP	LUMP			.
0380	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0012. B-40-864	LUMP	LUMP			.
0385	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0013. B-40-866	LUMP	LUMP			.
0390	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0014. B-40-891	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0395	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0001. R-40-504	LUMP	LUMP			.
0400	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0002. R-40-546	LUMP	LUMP			.
0405	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0003. R-40-548	LUMP	LUMP			.
0410	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0004. R-40-554	LUMP	LUMP			.
0415	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0005. R-40-555	LUMP	LUMP			.
0420	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0006. R-40-560	LUMP	LUMP			.
0425	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0007. R-40-618	LUMP	LUMP			.
0430	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0008. R-40-619	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0435	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0009. R-40-620	LUMP	LUMP			.
0440	209.0100 BACKFILL GRANULAR	41,796.000 CY		.		.
0445	209.0200.S BACKFILL CONTROLLED LOW STRENGTH	617.000 CY		.		.
0450	210.0100 BACKFILL STRUCTURE **P**	8,443.000 CY		.		.
0455	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH **P**	284,083.000 TON		.		.
0460	312.0115 SELECT CRUSHED MATERIAL **P**	205,909.000 CY		.		.
0465	415.0075 CONCRETE PAVEMENT 7 1/2-INCH **P**	7,443.000 SY		.		.
0470	415.0080 CONCRETE PAVEMENT 8-INCH **P**	10,999.000 SY		.		.
0475	415.0085 CONCRETE PAVEMENT 8 1/2-INCH **P**	37,091.000 SY		.		.
0480	415.0090 CONCRETE PAVEMENT 9-INCH **P**	48,763.000 SY		.		.
0485	415.0095 CONCRETE PAVEMENT 9 1/2-INCH **P**	4,550.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0490	415.0210 CONCRETE PAVEMENT GAPS	32.000 EACH		.		.
0495	415.0410 CONCRETE PAVEMENT APPROACH SLAB	2,712.000 SY		.		.
0500	415.1080 CONCRETE PAVEMENT HES 8-INCH	1,222.000 SY		.		.
0505	415.1085 CONCRETE PAVEMENT HES 8 1/2-INCH	42.000 SY		.		.
0510	415.1090 CONCRETE PAVEMENT HES 9-INCH	4,569.000 SY		.		.
0515	416.0170 CONCRETE DRIVEWAY 7-INCH **P**	1,721.000 SY		.		.
0520	416.0270 CONCRETE DRIVEWAY HES 7-INCH	666.000 SY		.		.
0525	416.0280 CONCRETE DRIVEWAY HES 8-INCH	138.000 SY		.		.
0530	416.0610 DRILLED TIE BARS	2,628.000 EACH		.		.
0535	416.0620 DRILLED DOWEL BARS	1,001.000 EACH		.		.
0540	416.1725 CONCRETE PAVEMENT REPLACEMENT SHES	80.000 SY		.		.

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0545	440.4410.S INCENTIVE IRI RIDE	51,116.000 DOL	1.00000		51116.00	
0550	455.0115 ASPHALTIC MATERIAL PG64-22	361.000 TON	.		.	
0555	455.0120 ASPHALTIC MATERIAL PG64-28	1,842.000 TON	.		.	
0560	455.0150 ASPHALTIC MATERIAL PG70-28P	116.000 TON	.		.	
0565	455.0605 TACK COAT	3,706.000 GAL	.		.	
0570	460.1101 HMA PAVEMENT TYPE E-1	779.000 TON	.		.	
0575	460.1110 HMA PAVEMENT TYPE E-10	30,710.000 TON	.		.	
0580	460.1130 HMA PAVEMENT TYPE E-30	7,183.000 TON	.		.	
0585	460.2000 INCENTIVE DENSITY HMA PAVEMENT	24,198.000 DOL	1.00000		24198.00	
0590	465.0105 ASPHALTIC SURFACE	234.000 TON	.		.	
0595	465.0120 ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES	77.000 TON	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0600	465.0125 ASPHALTIC SURFACE TEMPORARY	13,430.000 TON		.		.
0605	465.0310 ASPHALTIC CURB	871.000 LF		.		.
0610	502.0100 CONCRETE MASONRY BRIDGES **P**	5,091.000 CY		.		.
0615	502.3100 EXPANSION DEVICE (STRUCTURE) 0001. B-40-852 **P**	LUMP	LUMP			.
0620	502.3200 PROTECTIVE SURFACE TREATMENT **P**	41,511.000 SY		.		.
0625	502.5005 MASONRY ANCHORS TYPE L NO. 5 BARS **P**	171.000 EACH		.		.
0630	503.0137 PRESTRESSED GIRDER TYPE I 36W-INCH **P**	560.000 LF		.		.
0635	503.0146 PRESTRESSED GIRDER TYPE I 45W-INCH **P**	10,222.000 LF		.		.
0640	503.0155 PRESTRESSED GIRDER TYPE I 54W-INCH **P**	13,586.000 LF		.		.
0645	504.0500 CONCRETE MASONRY RETAINING WALLS **P**	13,509.000 CY		.		.
0650	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	362,776.000 LB		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0655	505.0415 BAR STEEL REINFORCEMENT HS RETAINING WALLS	47,270.000 LB		.		.
0660	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	2,235,745 LB		.		.
0665	505.0615 BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	1,459,783 LB		.		.
0670	506.0605 STRUCTURAL STEEL HS **P**	7,299,667 LB		.		.
0675	506.2605 BEARING PADS ELASTOMERIC NON-LAMINATED **P**	406.000 EACH		.		.
0680	506.3010 WELDED STUD SHEAR CONNECTORS 7/8X5-INCH **P**	19,895.000 EACH		.		.
0685	506.3015 WELDED STUD SHEAR CONNECTORS 7/8X6-INCH **P**	20,343.000 EACH		.		.
0690	506.3020 WELDED STUD SHEAR CONNECTORS 7/8X7-INCH **P**	11,536.000 EACH		.		.
0695	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0001. B-40-537 **P**	18.000 EACH		.		.
0700	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0002. B-40-538 **P**	20.000 EACH		.		.
0705	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0003. B-40-789 **P**	18.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0710	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0004. B-40-791 **P**	44.000 EACH		.		.
0715	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0005. B-40-798 **P**	6.000 EACH		.		.
0720	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0006. B-40-849 **P**	6.000 EACH		.		.
0725	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0007. B-40-857 **P**	54.000 EACH		.		.
0730	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0008. B-40-862 **P**	75.000 EACH		.		.
0735	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0009. B-40-863 **P**	30.000 EACH		.		.
0740	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0010. B-40-864 **P**	34.000 EACH		.		.
0745	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0011. B-40-866 **P**	68.000 EACH		.		.
0750	511.1200 TEMPORARY SHORING (STRUCTURE) 0002. R-40-524	350.000 SF		.		.
0755	511.1200 TEMPORARY SHORING (STRUCTURE) 0003. R-40-551	990.000 SF		.		.
0760	511.1200 TEMPORARY SHORING (STRUCTURE) 0004. R-40-552	605.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	511.1300 TEMPORARY					
0765	SHORING (LOCATION) 0001.	2,060.000				
	24FCB+78 TO 32FCB+19	SF		.		.
	511.1300 TEMPORARY					
0770	SHORING (LOCATION) 0002.	1,512.000				
	41FCB+67 TO 45FCB+07	SF		.		.
	511.1300 TEMPORARY					
0775	SHORING (LOCATION) 0003.	3,640.000				
	344NS+62 TO 346NS+00	SF		.		.
	511.1300 TEMPORARY					
0780	SHORING (LOCATION) 0004.	456.000				
	595SW+59 TO 595SW+78	SF		.		.
	511.1300 TEMPORARY					
0785	SHORING (LOCATION) 0005.	910.000				
	317NS+85 TO 318NS+20	SF		.		.
	511.1300 TEMPORARY					
0790	SHORING (LOCATION) 0006.	2,849.000				
	321NS+38 TO 323NS+97	SF		.		.
	511.1300 TEMPORARY					
0795	SHORING (LOCATION) 0007.	2,088.000				
	326NS+28 TO 327NS+14	SF		.		.
	511.1300 TEMPORARY					
0800	SHORING (LOCATION) 0008.	12,120.000				
	269EW+98 TO 279EW+44	SF		.		.
	511.1300 TEMPORARY					
0805	SHORING (LOCATION) 0009.	7,332.000				
	273EW+97 TO 279EW+25	SF		.		.
	511.1300 TEMPORARY					
0810	SHORING (LOCATION) 0010.	12,064.000				
	313NS+33 TO 318NS+00	SF		.		.
	511.1300 TEMPORARY					
0815	SHORING (LOCATION) 0011.	1,600.000				
	232EW+65 TO 233EW+15	SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0820	511.1300 TEMPORARY SHORING (LOCATION) 0012. 233EW+76 TO 234EW+26	1,600.000 SF		.		.
0825	511.1300 TEMPORARY SHORING (LOCATION) 0013. 152EW+14 TO 152EW+71	1,026.000 SF		.		.
0830	511.1300 TEMPORARY SHORING (LOCATION) 0014. 802BB+15 TO 802BB+36	273.000 SF		.		.
0835	511.1300 TEMPORARY SHORING (LOCATION) 0015. 802BB+16 TO 802BB+58	546.000 SF		.		.
0840	511.1300 TEMPORARY SHORING (LOCATION) 0016. 802BB+58 TO 803BB+00	546.000 SF		.		.
0845	511.1300 TEMPORARY SHORING (LOCATION) 0017. 802BB+80 TO 803BB+01	273.000 SF		.		.
0850	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0002. B-40-789	203.000 SF		.		.
0855	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0003. R-40-525	1,039.000 SF		.		.
0860	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0004. R-40-536	2,061.000 SF		.		.
0865	512.0500 PILING STEEL SHEET PERMANENT DELIVERED	10,826.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0870	512.0600 PILING STEEL SHEET PERMANENT DRIVEN	10,826.000 SF		.		.
0875	513.2000 RAILING PIPE (STRUCTURE) 0001. B-40-798	LUMP	LUMP			.
0880	513.2000 RAILING PIPE (STRUCTURE) 0002. B-40-864	LUMP	LUMP			.
0885	513.2000 RAILING PIPE (STRUCTURE) 0003. R-40-504	LUMP	LUMP			.
0890	513.2000 RAILING PIPE (STRUCTURE) 0004. R-40-524	LUMP	LUMP			.
0895	513.2000 RAILING PIPE (STRUCTURE) 0005. R-40-525	LUMP	LUMP			.
0900	513.2000 RAILING PIPE (STRUCTURE) 0006. R-40-546	LUMP	LUMP			.
0905	513.2000 RAILING PIPE (STRUCTURE) 0007. R-40-548	LUMP	LUMP			.
0910	513.2000 RAILING PIPE (STRUCTURE) 0008. R-40-554	LUMP	LUMP			.
0915	513.2000 RAILING PIPE (STRUCTURE) 0009. R-40-555	LUMP	LUMP			.
0920	513.2000 RAILING PIPE (STRUCTURE) 0010. R-40-556	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0925	513.2000 RAILING PIPE (STRUCTURE) 0011. R-40-557	LUMP	LUMP			.
0930	513.2000 RAILING PIPE (STRUCTURE) 0013. R-40-560	LUMP	LUMP			.
0935	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0001. R-40-618	LUMP	LUMP			.
0940	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0002. R-40-619	LUMP	LUMP			.
0945	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0003. R-40-620	LUMP	LUMP			.
0950	514.0445 FLOOR DRAINS TYPE GC	1.000 EACH		.		.
0955	514.0450 FLOOR DRAINS TYPE WF	4.000 EACH		.		.
0960	514.2608 DOWNSPOUT 8-INCH **P**	566.000 LF		.		.
0965	514.2625 DOWNSPOUT 6-INCH **P**	50.000 LF		.		.
0970	516.0100 DAMPPROOFING **P**	6,358.000 SY		.		.
0975	516.0500 RUBBERIZED MEMBRANE WATERPROOFING **P**	2,418.000 SY		.		.

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0980	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0001. B-40-852	LUMP	LUMP			.
0985	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0002. B-40-891	LUMP	LUMP			.
0990	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0003. R-40-546	LUMP	LUMP			.
0995	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0004. R-40-548	LUMP	LUMP			.
1000	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0005. R-40-554	LUMP	LUMP			.
1005	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0006. R-40-555	LUMP	LUMP			.
1010	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0007. R-40-560	LUMP	LUMP			.
1015	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0008. R-40-618	LUMP	LUMP			.
1020	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0009. R-40-619	LUMP	LUMP			.
1025	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0010. R-40-620	LUMP	LUMP			.
1030	517.1010.S CONCRETE STAINING (STRUCTURE) 0001. B-40-785 **P**	12,742.000 SF	.			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1035	517.1010.S CONCRETE STAINING (STRUCTURE) 0002. R-40-554 **P**	15,998.000 SF		.		.
1040	517.1010.S CONCRETE STAINING (STRUCTURE) 0003. R-40-555 **P**	25,452.000 SF		.		.
1045	517.1010.S CONCRETE STAINING (STRUCTURE) 0004. R-40-560 **P**	10,480.000 SF		.		.
1050	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0001. R-40-501 **P**	889.000 SF		.		.
1055	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0002. R-40-504 **P**	20,783.000 SF		.		.
1060	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0003. R-40-511 **P**	37,391.000 SF		.		.
1065	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0004. R-40-514 **P**	8,550.000 SF		.		.
1070	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0005. R-40-522 **P**	1,875.000 SF		.		.
1075	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0006. R-40-523 **P**	560.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1080	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0007. R-40-524 **P**	3,500.000 SF		.		.
1085	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0008. R-40-525 **P**	26,046.000 SF		.		.
1090	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0009. R-40-536 **P**	17,126.000 SF		.		.
1095	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0010. R-40-546 **P**	35,235.000 SF		.		.
1100	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0011. R-40-548 **P**	32,035.000 SF		.		.
1105	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0012. R-40-551 **P**	12,260.000 SF		.		.
1110	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0013. R-40-552 **P**	26,485.000 SF		.		.
1115	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0014. R-40-554 **P**	3,569.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1120	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0015. R-40-555 **P**	2,089.000 SF		.		.
1125	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0016. R-40-556 **P**	17,035.000 SF		.		.
1130	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0017. R-40-557 **P**	15,815.000 SF		.		.
1135	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0018. R-40-560 **P**	9,690.000 SF		.		.
1140	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0019. R-40-618 **P**	809.000 SF		.		.
1145	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0020. R-40-619 **P**	1,061.000 SF		.		.
1150	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0021. R-40-620 **P**	1,304.000 SF		.		.
1155	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0022. MINOR RETAINING WALL R-1 **P**	1,150.000 SF		.		.
1160	520.8000 CONCRETE COLLARS FOR PIPE	130.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1165	522.1012 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 12-INCH	4.000 EACH		.		.
1170	522.1015 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 15-INCH	1.000 EACH		.		.
1175	522.1018 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 18-INCH	3.000 EACH		.		.
1180	522.1024 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 24-INCH	6.000 EACH		.		.
1185	522.1036 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 36-INCH	2.000 EACH		.		.
1190	523.0558 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL 58X91-INCH	1.000 EACH		.		.
1195	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0001. N-40-62 **P**	13,870.000 SF		.		.
1200	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0002. N-40-68 **P**	20,600.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1205	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0003. N-40-69 **P**	58,270.000 SF		.		.
1210	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0004. N-40-70 **P**	9,670.000 SF		.		.
1215	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0005. N-40-71 **P**	15,170.000 SF		.		.
1220	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0006. N-40-72 **P**	19,220.000 SF		.		.
1225	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0007. N-40-73 **P**	17,090.000 SF		.		.
1230	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0008. N-40-74 **P**	6,600.000 SF		.		.
1235	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0009. N-40-75 **P**	14,250.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1240	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0010. N-40-80 **P**	14,930.000 SF		.		.
1245	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0011. N-40-81 **P**	11,080.000 SF		.		.
1250	550.0010 PRE-BORING UNCONSOLIDATED MATERIALS	25.000 LF		.		.
1255	550.0500 PILE POINTS	482.000 EACH		.		.
1260	550.1100 PILING STEEL HP 10-INCH X 42 LB	2,340.000 LF		.		.
1265	550.1120 PILING STEEL HP 12-INCH X 53 LB	17,175.000 LF		.		.
1270	550.1140 PILING STEEL HP 14-INCH X 73 LB	8,645.000 LF		.		.
1275	550.2146 PILING CIP CONCRETE 14 X 0.375-INCH	12,259.000 LF		.		.
1280	550.2148 PILING CIP CONCRETE 14 X 0.50-INCH	4,559.000 LF		.		.
1285	550.2168 PILING CIP CONCRETE 16 X 0.50-INCH	1,875.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1290	601.0319 CONCRETE CURB & GUTTER 19-INCH **P**	1,072.000 LF		.		.
1295	601.0331 CONCRETE CURB & GUTTER 31-INCH **P**	28,199.000 LF		.		.
1300	601.0551 CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE A **P**	1,798.000 LF		.		.
1305	601.0600 CONCRETE CURB PEDESTRIAN **P**	878.000 LF		.		.
1310	602.0410 CONCRETE SIDEWALK 5-INCH **P**	96,243.000 SF		.		.
1315	602.0515 CURB RAMP DETECTABLE WARNING FIELD NATURAL PATINA	1,112.000 SF		.		.
1320	602.1500 CONCRETE STEPS	209.000 SF		.		.
1325	603.1132 CONCRETE BARRIER TYPE S32	2,820.000 LF		.		.
1330	603.1142 CONCRETE BARRIER TYPE S42	39,927.000 LF		.		.
1335	603.1156 CONCRETE BARRIER TYPE S56	2,356.000 LF		.		.
1340	603.1332 CONCRETE BARRIER TYPE S32B	32.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1345	603.1342 CONCRETE BARRIER TYPE S42B	88.000 LF		.		.
1350	603.1436 CONCRETE BARRIER TYPE S36C	222.000 LF		.		.
1355	603.1442 CONCRETE BARRIER TYPE S42C	504.000 LF		.		.
1360	603.3111 CONCRETE BARRIER TRANSITION TYPE NJ32SF TO S32	1.000 EACH		.		.
1365	603.3211 CONCRETE BARRIER TRANSITION TYPE F32SF TO S32	11.000 EACH		.		.
1370	603.3513 CONCRETE BARRIER TRANSITION TYPE S32 TO S36	14.000 EACH		.		.
1375	603.3535 CONCRETE BARRIER TRANSITION TYPE S36 TO S42	7.000 EACH		.		.
1380	603.3559 CONCRETE BARRIER TRANSITION TYPE S42 TO S56	9.000 EACH		.		.
1385	603.8000 CONCRETE BARRIER TEMPORARY PRECAST DELIVERED	77,323.000 LF		.		.
1390	603.8125 CONCRETE BARRIER TEMPORARY PRECAST INSTALLED	140,260.000 LF		.		.
1395	604.0400 SLOPE PAVING CONCRETE **P**	414.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1400	604.0500 SLOPE PAVING CRUSHED AGGREGATE **P**	1,602.000 SY		.		.
1405	606.0200 RIPRAP MEDIUM	267.000 CY		.		.
1410	607.0600.S STORM SEWER PIPE (INCH) 0001. 10-INCH	11.000 LF		.		.
1415	608.0312 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 12-INCH	2,301.000 LF		.		.
1420	608.0315 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 15-INCH	2,768.000 LF		.		.
1425	608.0318 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 18-INCH	4,915.000 LF		.		.
1430	608.0324 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 24-INCH	21,214.000 LF		.		.
1435	608.0330 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 30-INCH	1,843.000 LF		.		.
1440	608.0336 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 36-INCH	1,112.000 LF		.		.
1445	608.0342 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 42-INCH	173.000 LF		.		.
1450	608.0348 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 48-INCH	2,250.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1455	608.0354 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 54-INCH	1,532.000 LF		.		.
1460	608.0360 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 60-INCH	1,275.000 LF		.		.
1465	608.0366 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 66-INCH	990.000 LF		.		.
1470	608.0372 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 72-INCH	1,902.000 LF		.		.
1475	608.0396 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 96-INCH	16.000 LF		.		.
1480	608.0412 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 12-INCH	654.000 LF		.		.
1485	608.0415 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 15-INCH	378.000 LF		.		.
1490	608.0418 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 18-INCH	456.000 LF		.		.
1495	608.0424 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 24-INCH	2,947.000 LF		.		.
1500	608.0430 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 30-INCH	1,089.000 LF		.		.
1505	608.0436 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 36-INCH	475.000 LF		.		.

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1510	608.0448 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 48-INCH	2,175.000 LF		.		.
1515	608.0454 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 54-INCH	655.000 LF		.		.
1520	608.0466 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 66-INCH	426.000 LF		.		.
1525	608.0472 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 72-INCH	101.000 LF		.		.
1530	608.0478 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 78-INCH	461.000 LF		.		.
1535	608.0515 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 15-INCH	19.000 LF		.		.
1540	608.0518 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 18-INCH	144.000 LF		.		.
1545	608.0524 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 24-INCH	408.000 LF		.		.
1550	608.0530 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 30-INCH	35.000 LF		.		.
1555	608.0536 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 36-INCH	54.000 LF		.		.
1560	608.0572 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 72-INCH	287.000 LF		.		.

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1565	610.0158 STORM SEWER PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III 58X91-INCH	594.000 LF		.		.
1570	611.0420 RECONSTRUCTING MANHOLES	6.000 EACH		.		.
1575	611.0430 RECONSTRUCTING INLETS	10.000 EACH		.		.
1580	611.0535 MANHOLE COVERS TYPE J-SPECIAL	102.000 EACH		.		.
1585	611.0600 INLET COVERS TYPE A	7.000 EACH		.		.
1590	611.0606 INLET COVERS TYPE B	8.000 EACH		.		.
1595	611.0624 INLET COVERS TYPE H	167.000 EACH		.		.
1600	611.0627 INLET COVERS TYPE HM	9.000 EACH		.		.
1605	611.0642 INLET COVERS TYPE MS	85.000 EACH		.		.
1610	611.0654 INLET COVERS TYPE V	308.000 EACH		.		.

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1615	611.0663 INLET COVERS TYPE X	40.000 EACH		.		.
1620	611.0666 INLET COVERS TYPE Z	3.000 EACH		.		.
1625	611.1004 CATCH BASINS 4-FT DIAMETER	64.000 EACH		.		.
1630	611.1005 CATCH BASINS 5-FT DIAMETER	6.000 EACH		.		.
1635	611.1006 CATCH BASINS 6-FT DIAMETER	3.000 EACH		.		.
1640	611.1230 CATCH BASINS 2X3-FT	26.000 EACH		.		.
1645	611.2003 MANHOLES 3-FT DIAMETER	4.000 EACH		.		.
1650	611.2004 MANHOLES 4-FT DIAMETER	42.000 EACH		.		.
1655	611.2005 MANHOLES 5-FT DIAMETER	132.000 EACH		.		.
1660	611.2006 MANHOLES 6-FT DIAMETER	40.000 EACH		.		.
1665	611.2007 MANHOLES 7-FT DIAMETER	28.000 EACH		.		.

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1670	611.2008 MANHOLES 8-FT DIAMETER	26.000 EACH		.		.
1675	611.3003 INLETS 3-FT DIAMETER	12.000 EACH		.		.
1680	611.3004 INLETS 4-FT DIAMETER	338.000 EACH		.		.
1685	611.3220 INLETS 2X2-FT	7.000 EACH		.		.
1690	611.3225 INLETS 2X2.5-FT	31.000 EACH		.		.
1695	611.3901 INLETS MEDIAN 1 GRATE	27.000 EACH		.		.
1700	611.3902 INLETS MEDIAN 2 GRATE	29.000 EACH		.		.
1705	611.8110 ADJUSTING MANHOLE COVERS	32.000 EACH		.		.
1710	611.8115 ADJUSTING INLET COVERS	19.000 EACH		.		.
1715	611.8120.S COVER PLATES TEMPORARY	68.000 EACH		.		.
1720	611.9800.S PIPE GRATES	17.000 EACH		.		.

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1725	612.0104 PIPE UNDERDRAIN 4-INCH	137.000 LF		.		.
1730	612.0106 PIPE UNDERDRAIN 6-INCH	1,211.000 LF		.		.
1735	612.0206 PIPE UNDERDRAIN UNPERFORATED 6-INCH	1,336.000 LF		.		.
1740	612.0406 PIPE UNDERDRAIN WRAPPED 6-INCH	12,883.000 LF		.		.
1745	612.0806 APRON ENDWALLS FOR UNDERDRAIN REINFORCED CONCRETE 6-INCH	4.000 EACH		.		.
1750	612.0902.S INSULATION BOARD POLYSTYRENE (INCH) 0001. 4-INCH	35.000 SY		.		.
1755	614.0805 CRASH CUSHIONS PERMANENT LOW MAINTENANCE	11.000 EACH		.		.
1760	614.0905 CRASH CUSHIONS TEMPORARY	61.000 EACH		.		.
1765	614.2300 MGS GUARDRAIL 3	660.000 LF		.		.
1770	614.2500 MGS THRIE BEAM TRANSITION	234.000 LF		.		.
1775	614.2610 MGS GUARDRAIL TERMINAL EAT	7.000 EACH		.		.

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1780	614.2620 MGS GUARDRAIL TERMINAL TYPE 2	1.000 EACH		.		.
1785	616.0206 FENCE CHAIN LINK 6-FT	7,612.000 LF		.		.
1790	616.0208 FENCE CHAIN LINK 8-FT	2,346.000 LF		.		.
1795	616.0329 GATES CHAIN LINK (WIDTH) 0001. 8-FT	1.000 EACH		.		.
1800	616.0329 GATES CHAIN LINK (WIDTH) 0002. 12-FT	2.000 EACH		.		.
1805	616.0406 FENCE CHAIN LINK SALVAGED 6-FT	157.000 LF		.		.
1810	616.0700.S FENCE SAFETY	2,500.000 LF		.		.
1815	619.1000 MOBILIZATION	1.000 EACH		.		.
1820	620.0300 CONCRETE MEDIAN SLOPED NOSE **P**	1,512.000 SF		.		.
1825	623.0200 DUST CONTROL SURFACE TREATMENT	561,365.000 SY		.		.
1830	624.0100 WATER	4,534.000 MGAL		.		.

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1835	628.1104 EROSION BALES	997.000 EACH		.		.
1840	628.1504 SILT FENCE	25,865.000 LF		.		.
1845	628.1520 SILT FENCE MAINTENANCE	25,865.000 LF		.		.
1850	628.1905 MOBILIZATIONS EROSION CONTROL	40.000 EACH		.		.
1855	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL	20.000 EACH		.		.
1860	628.2004 EROSION MAT CLASS I TYPE B	332,795.000 SY		.		.
1865	628.2021 EROSION MAT CLASS II TYPE A	245.000 SY		.		.
1870	628.2023 EROSION MAT CLASS II TYPE B	134,805.000 SY		.		.
1875	628.6510 SOIL STABILIZER TYPE B	3.200 ACRE		.		.
1880	628.7005 INLET PROTECTION TYPE A	1,442.000 EACH		.		.
1885	628.7010 INLET PROTECTION TYPE B	414.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1890	628.7015 INLET PROTECTION TYPE C	672.000 EACH		.		.
1895	628.7020 INLET PROTECTION TYPE D	1,682.000 EACH		.		.
1900	628.7504 TEMPORARY DITCH CHECKS	3,640.000 LF		.		.
1905	628.7555 CULVERT PIPE CHECKS	11.000 EACH		.		.
1910	628.7560 TRACKING PADS	33.000 EACH		.		.
1915	628.7570 ROCK BAGS	250.000 EACH		.		.
1920	629.0210 FERTILIZER TYPE B	216.700 CWT		.		.
1925	630.0130 SEEDING MIXTURE NO. 30	3,997.000 LB		.		.
1930	630.0180 SEEDING MIXTURE NO. 80	768.000 LB		.		.
1935	630.0200 SEEDING TEMPORARY	4,439.000 LB		.		.
1940	630.0400 SEEDING NURSE CROP	1,012.000 LB		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1945	631.0300 SOD WATER	413.700 MGAL		.		.
1950	631.1000 SOD LAWN	18,416.000 SY		.		.
1955	632.0101 TREES (SPECIES, ROOT, SIZE) 0001. COFFEETREE KENTUCKY B&B 2 1/2-INCH CAL	2.000 EACH		.		.
1960	632.0101 TREES (SPECIES, ROOT, SIZE) 0003. HACKBERRY COMMON B&B 2 1/2-INCH CAL	2.000 EACH		.		.
1965	632.0101 TREES (SPECIES, ROOT, SIZE) 0005. MAPLE FREEMAN ARMSTRONG B&B 2 1-2-INCH CAL	4.000 EACH		.		.
1970	632.0101 TREES (SPECIES, ROOT, SIZE) 0007. MAPLE MORTON MIYABE B&B 2 1/2-INCH CAL	3.000 EACH		.		.
1975	632.0101 TREES (SPECIES, ROOT, SIZE) 0009. OAK SWAMP WHITE B&B 2 1/2-INCH CAL	4.000 EACH		.		.
1980	632.0101 TREES (SPECIES, ROOT, SIZE) 0011. OAK BUR B&B 2 1/2-INCH CAL	3.000 EACH		.		.
1985	632.0101 TREES (SPECIES, ROOT, SIZE) 0013. CRABAPPLE PRAIRIFIRE B&B 2-INCH CAL	5.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1990	632.0101 TREES (SPECIES, ROOT, SIZE) 0015. CRABAPPLE RED BARON B&B 2-INCH CAL	6.000 EACH		.		.
1995	632.0101 TREES (SPECIES, ROOT, SIZE) 0017. HAWTHORN THORNLESS COCKSPUR B&B 2-INCH CAL	3.000 EACH		.		.
2000	632.0101 TREES (SPECIES, ROOT, SIZE) 0019. REDCEDAR EASTERN B&B 5-FOOT HT	7.000 EACH		.		.
2005	632.0101 TREES (SPECIES, ROOT, SIZE) 0021. SPRUCE COLORADO GREEN B&B 5-FOOT	15.000 EACH		.		.
2010	632.0101 TREES (SPECIES, ROOT, SIZE) 0023. SPRUCE HOOPS BLUE COLORADO B&B 5-FOOT HT	6.000 EACH		.		.
2015	632.0201 SHRUBS (SPECIES, ROOT, SIZE) 0025. DOGWOOD CORNELIANCHERRY B&B 6-FOOT HT	14.000 EACH		.		.
2020	632.0201 SHRUBS (SPECIES, ROOT, SIZE) 0027. VIBURNUM LITTLE JOE 24-INCH CG	36.000 EACH		.		.
2025	632.9101 LANDSCAPE PLANTING SURVEILLANCE AND CARE CYCLES	24.000 EACH		.		.
2030	633.0500 DELINEATOR REFLECTORS	424.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2035	633.1000 DELINEATOR BRACKETS	424.000 EACH		.		.
2040	633.5200 MARKERS CULVERT END	17.000 EACH		.		.
2045	634.0618 POSTS WOOD 4X6-INCH X 18-FT	144.000 EACH		.		.
2050	634.0620 POSTS WOOD 4X6-INCH X 20-FT	8.000 EACH		.		.
2055	634.0622 POSTS WOOD 4X6-INCH X 22-FT	60.000 EACH		.		.
2060	634.0816 POSTS TUBULAR STEEL 2X2-INCH X 16-FT	155.000 EACH		.		.
2065	634.0885 POSTS TUBULAR STEEL 2X2-INCH X 8.5-FT	88.000 EACH		.		.
2070	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS	11,200.000 LB		.		.
2075	635.0300 SIGN SUPPORTS REPLACING BASE CONNECTION BOLTS	2.000 EACH		.		.
2080	636.0100 SIGN SUPPORTS CONCRETE MASONRY **P**	1,341.700 CY		.		.
2085	636.0500 SIGN SUPPORTS STEEL REINFORCEMENT	1,206.000 LB		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2090	636.1000 SIGN SUPPORTS STEEL REINFORCEMENT HS	115,325.000 LB		.		.
2095	636.1500 SIGN SUPPORTS STEEL COATED REINFORCEMENT HS	189,375.000 LB		.		.
2100	637.1210 SIGNS TYPE I REFLECTIVE H	2,538.000 SF		.		.
2105	637.1220 SIGNS TYPE I REFLECTIVE SH	14,265.000 SF		.		.
2110	637.1230 SIGNS TYPE I REFLECTIVE F	202.500 SF		.		.
2115	637.2210 SIGNS TYPE II REFLECTIVE H	2,850.130 SF		.		.
2120	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING	144.600 SF		.		.
2125	637.2230 SIGNS TYPE II REFLECTIVE F	1,060.000 SF		.		.
2130	638.2101 MOVING SIGNS TYPE I	4.000 EACH		.		.
2135	638.2102 MOVING SIGNS TYPE II	110.000 EACH		.		.
2140	638.2601 REMOVING SIGNS TYPE I	60.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2145	638.2602 REMOVING SIGNS TYPE II	593.000 EACH		.		.
2150	638.3000 REMOVING SMALL SIGN SUPPORTS	350.000 EACH		.		.
2155	638.3100 REMOVING STRUCTURAL STEEL SIGN SUPPORTS	55.000 EACH		.		.
2160	641.0100 SIGN BRIDGE SINGLE POLE SIGN SUPPORT ONE SIGN (STRUCTURE) 0001. S-40-788	LUMP	LUMP			.
2165	641.0100 SIGN BRIDGE SINGLE POLE SIGN SUPPORT ONE SIGN (STRUCTURE) 0002. S-40-789	LUMP	LUMP			.
2170	641.0600 SIGN BRIDGE SINGLE POLE SIGN SUPPORT TWO SIGNS (STRUCTURE) 0001. S-40-790	LUMP	LUMP			.
2175	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0001. S-40-28	LUMP	LUMP			.
2180	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0002. S-40-65	LUMP	LUMP			.
2185	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0003. S-40-85	LUMP	LUMP			.
2190	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0004. S-40-118	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2195	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0005. S-40-119	LUMP	LUMP			.
2200	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0006. S-40-124	LUMP	LUMP			.
2205	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0007. S-40-129	LUMP	LUMP			.
2210	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0008. S-40-130	LUMP	LUMP			.
2215	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0009. S-40-131	LUMP	LUMP			.
2220	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0010. S-40-134	LUMP	LUMP			.
2225	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0011. S-40-137	LUMP	LUMP			.
2230	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0012. S-40-146	LUMP	LUMP			.
2235	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0013. S-40-158	LUMP	LUMP			.
2240	641.6600 SIGN BRIDGE (STRUCTURE) 0001. S-40-22	LUMP	LUMP			.
2245	641.6600 SIGN BRIDGE (STRUCTURE) 0002. S-40-27	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2250	641.6600 SIGN BRIDGE (STRUCTURE) 0003. S-40-43	LUMP	LUMP			.
2255	641.6600 SIGN BRIDGE (STRUCTURE) 0004. S-40-44	LUMP	LUMP			.
2260	641.6600 SIGN BRIDGE (STRUCTURE) 0005. S-40-47	LUMP	LUMP			.
2265	641.6600 SIGN BRIDGE (STRUCTURE) 0006. S-40-50	LUMP	LUMP			.
2270	641.6600 SIGN BRIDGE (STRUCTURE) 0007. S-40-51	LUMP	LUMP			.
2275	641.6600 SIGN BRIDGE (STRUCTURE) 0008. S-40-87	LUMP	LUMP			.
2280	641.6600 SIGN BRIDGE (STRUCTURE) 0009. S-40-104	LUMP	LUMP			.
2285	641.6600 SIGN BRIDGE (STRUCTURE) 0010. S-40-116	LUMP	LUMP			.
2290	641.6600 SIGN BRIDGE (STRUCTURE) 0011. S-40-117	LUMP	LUMP			.
2295	641.6600 SIGN BRIDGE (STRUCTURE) 0012. S-40-121	LUMP	LUMP			.
2300	641.6600 SIGN BRIDGE (STRUCTURE) 0013. S-40-122	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2305	641.6600 SIGN BRIDGE (STRUCTURE) 0014. S-40-132	LUMP	LUMP			.
2310	641.6600 SIGN BRIDGE (STRUCTURE) 0015. S-40-135	LUMP	LUMP			.
2315	641.6600 SIGN BRIDGE (STRUCTURE) 0016. S-40-136	LUMP	LUMP			.
2320	641.6600 SIGN BRIDGE (STRUCTURE) 0017. S-40-443	LUMP	LUMP			.
2325	641.6600 SIGN BRIDGE (STRUCTURE) 0018. S-40-444	LUMP	LUMP			.
2330	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0001. S-40-991	LUMP	LUMP			.
2335	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0002. S-40-992	LUMP	LUMP			.
2340	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0003. S-40-993	LUMP	LUMP			.
2345	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0004. S-40-989	LUMP	LUMP			.
2350	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0005. S-40-147	LUMP	LUMP			.
2355	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0006. S-40-148	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2360	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0007. S-40-149	LUMP	LUMP			.
2365	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0008. S-40-995	LUMP	LUMP			.
2370	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0009. S-40-996	LUMP	LUMP			.
2375	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0010. S-40-971	LUMP	LUMP			.
2380	643.0200 TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE (PROJECT) 0001. 1060-33-80	636.000 DAY		.		.
2385	643.0300 TRAFFIC CONTROL DRUMS	482,182.000 DAY		.		.
2390	643.0410 TRAFFIC CONTROL BARRICADES TYPE II	6,814.000 DAY		.		.
2395	643.0420 TRAFFIC CONTROL BARRICADES TYPE III	65,009.000 DAY		.		.
2400	643.0500 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER POSTS	391.000 EACH		.		.
2405	643.0600 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER BASES	391.000 EACH		.		.
2410	643.0705 TRAFFIC CONTROL WARNING LIGHTS TYPE A	129,993.000 DAY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2415	643.0715 TRAFFIC CONTROL WARNING LIGHTS TYPE C	85,856.000 DAY		.		.
2420	643.0800 TRAFFIC CONTROL ARROW BOARDS	3,958.000 DAY		.		.
2425	643.0900 TRAFFIC CONTROL SIGNS	239,804.000 DAY		.		.
2430	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I	89.000 EACH		.		.
2435	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II	254.000 EACH		.		.
2440	643.1000 TRAFFIC CONTROL SIGNS FIXED MESSAGE	3,649.750 SF		.		.
2445	643.1050 TRAFFIC CONTROL SIGNS PCMS	5,139.000 DAY		.		.
2450	643.2000 TRAFFIC CONTROL DETOUR (PROJECT) 0001. 1060-33-80	1.000 EACH		.		.
2455	643.3000 TRAFFIC CONTROL DETOUR SIGNS	635,043.000 DAY		.		.
2460	645.0111 GEOTEXTILE FABRIC TYPE DF SCHEDULE A **P**	544.000 SY		.		.
2465	645.0112 GEOTEXTILE FABRIC TYPE DF SCHEDULE B **P**	1,332.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2470	645.0120 GEOTEXTILE FABRIC TYPE HR **P**	340.000 SY		.		.
2475	645.0130 GEOTEXTILE FABRIC TYPE R **P**	3,439.000 SY		.		.
2480	645.0140 GEOTEXTILE FABRIC TYPE SAS **P**	15,615.000 SY		.		.
2485	646.0106 PAVEMENT MARKING EPOXY 4-INCH	249,280.000 LF		.		.
2490	646.0126 PAVEMENT MARKING EPOXY 8-INCH	20,133.000 LF		.		.
2495	646.0600 REMOVING PAVEMENT MARKINGS	97,838.000 LF		.		.
2500	646.0841.S PAVEMENT MARKING GROOVED WET REFLECTIVE CONTRAST TAPE 4-INCH **P**	13,131.000 LF		.		.
2505	646.0843.S PAVEMENT MARKING GROOVED WET REFLECTIVE CONTRAST TAPE 8-INCH **P**	16,747.000 LF		.		.
2510	646.0883.S PAVEMENT MARKING GROOVED WET REFLECTIVE TAPE 8-INCH **P**	824.000 LF		.		.
2515	647.0196 PAVEMENT MARKING ARROWS EPOXY TYPE 5	4.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2520	647.0456 PAVEMENT MARKING CURB EPOXY	617.000 LF		.		.
2525	647.0566 PAVEMENT MARKING STOP LINE EPOXY 18-INCH	200.000 LF		.		.
2530	647.0606 PAVEMENT MARKING ISLAND NOSE EPOXY	16.000 EACH		.		.
2535	647.0656 PAVEMENT MARKING PARKING STALL EPOXY	666.000 LF		.		.
2540	647.0726 PAVEMENT MARKING DIAGONAL EPOXY 12-INCH	3,688.000 LF		.		.
2545	647.0746 PAVEMENT MARKING DIAGONAL EPOXY 24-INCH	3,416.000 LF		.		.
2550	647.0955 REMOVING PAVEMENT MARKINGS ARROWS	6.000 EACH		.		.
2555	649.0100 TEMPORARY PAVEMENT MARKING 4-INCH	14,400.000 LF		.		.
2560	649.0200 TEMPORARY PAVEMENT MARKING REFLECTIVE PAINT 4-INCH	106,472.000 LF		.		.
2565	649.0400 TEMPORARY PAVEMENT MARKING REMOVABLE TAPE 4-INCH	115,784.000 LF		.		.
2570	649.0701 TEMPORARY PAVEMENT MARKING 8-INCH	2,581.000 LF		.		.

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2575	649.0801 TEMPORARY PAVEMENT MARKING REMOVABLE TAPE 8-INCH	17,588.000 LF		.		.
2580	649.2100 TEMPORARY RAISED PAVEMENT MARKERS	120.000 EACH		.		.
2585	652.0125 CONDUIT RIGID METALLIC 2-INCH	1,173.000 LF		.		.
2590	652.0130 CONDUIT RIGID METALLIC 2 1/2-INCH	12.000 LF		.		.
2595	652.0135 CONDUIT RIGID METALLIC 3-INCH	6.000 LF		.		.
2600	652.0210 CONDUIT RIGID NONMETALLIC SCHEDULE 40 1-INCH	266.000 LF		.		.
2605	652.0225 CONDUIT RIGID NONMETALLIC SCHEDULE 40 2-INCH	45,173.000 LF		.		.
2610	652.0230 CONDUIT RIGID NONMETALLIC SCHEDULE 40 2 1/2-INCH	928.000 LF		.		.
2615	652.0235 CONDUIT RIGID NONMETALLIC SCHEDULE 40 3-INCH	36,232.000 LF		.		.
2620	652.0325 CONDUIT RIGID NONMETALLIC SCHEDULE 80 2-INCH	8,926.000 LF		.		.
2625	652.0605 CONDUIT SPECIAL 2-INCH	5,678.000 LF		.		.

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2630	652.0615 CONDUIT SPECIAL 3-INCH	1,065.000 LF		.		.
2635	652.0700.S INSTALL CONDUIT INTO EXISTING ITEM	17.000 EACH		.		.
2640	652.0800 CONDUIT LOOP DETECTOR	8,761.000 LF		.		.
2645	653.0105 PULL BOXES STEEL 12X24-INCH	12.000 EACH		.		.
2650	653.0135 PULL BOXES STEEL 24X36-INCH	68.000 EACH		.		.
2655	653.0140 PULL BOXES STEEL 24X42-INCH	144.000 EACH		.		.
2660	653.0220 JUNCTION BOXES 18X6X6-INCH	16.000 EACH		.		.
2665	653.0222 JUNCTION BOXES 18X12X6-INCH	63.000 EACH		.		.
2670	653.0905 REMOVING PULL BOXES	116.000 EACH		.		.
2675	654.0101 CONCRETE BASES TYPE 1	41.000 EACH		.		.
2680	654.0102 CONCRETE BASES TYPE 2	5.000 EACH		.		.

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2685	654.0105 CONCRETE BASES TYPE 5	118.000 EACH		.		.
2690	654.0110 CONCRETE BASES TYPE 10	8.000 EACH		.		.
2695	654.0113 CONCRETE BASES TYPE 13	8.000 EACH		.		.
2700	654.0217 CONCRETE CONTROL CABINET BASES TYPE 9 SPECIAL	3.000 EACH		.		.
2705	655.0230 CABLE TRAFFIC SIGNAL 5-14 AWG	4,341.000 LF		.		.
2710	655.0240 CABLE TRAFFIC SIGNAL 7-14 AWG	7,126.000 LF		.		.
2715	655.0250 CABLE TRAFFIC SIGNAL 9-14 AWG	310.000 LF		.		.
2720	655.0255 CABLE TRAFFIC SIGNAL 12-12 AWG	5,354.000 LF		.		.
2725	655.0260 CABLE TRAFFIC SIGNAL 12-14 AWG	5,237.000 LF		.		.
2730	655.0270 CABLE TRAFFIC SIGNAL 15-14 AWG	514.000 LF		.		.
2735	655.0305 CABLE TYPE UF 2-12 AWG GROUNDED	3,360.000 LF		.		.

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2740	655.0320 CABLE TYPE UF 2-10 AWG GROUNDED	2,992.000	LF		.		.
2745	655.0505 ELECTRICAL WIRE TRAFFIC SIGNALS 14 AWG	19,670.000	LF		.		.
2750	655.0515 ELECTRICAL WIRE TRAFFIC SIGNALS 10 AWG	10,632.000	LF		.		.
2755	655.0610 ELECTRICAL WIRE LIGHTING 12 AWG	31,519.000	LF		.		.
2760	655.0615 ELECTRICAL WIRE LIGHTING 10 AWG	954.000	LF		.		.
2765	655.0620 ELECTRICAL WIRE LIGHTING 8 AWG	55,195.000	LF		.		.
2770	655.0625 ELECTRICAL WIRE LIGHTING 6 AWG	143,564.000	LF		.		.
2775	655.0630 ELECTRICAL WIRE LIGHTING 4 AWG	10,616.000	LF		.		.
2780	655.0635 ELECTRICAL WIRE LIGHTING 2 AWG	11,002.000	LF		.		.
2785	655.0640 ELECTRICAL WIRE LIGHTING 1 AWG	210.000	LF		.		.
2790	655.0645 ELECTRICAL WIRE LIGHTING 1/0 AWG	1,962.000	LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2795	655.0700 LOOP DETECTOR LEAD IN CABLE	34,500.000 LF		.		.
2800	655.0800 LOOP DETECTOR WIRE	28,120.000 LF		.		.
2805	655.0900 TRAFFIC SIGNAL EVP DETECTOR CABLE	6,020.000 LF		.		.
2810	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 1100. ATR214EW AND ATR215EW	LUMP	LUMP			.
2815	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2001. CB-SDS-40-0051	LUMP	LUMP			.
2820	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2002. CB-SDS-40-0227	LUMP	LUMP			.
2825	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2003. CB-RM-40-0010	LUMP	LUMP			.
2830	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2004. CB-SDS-40-0228	LUMP	LUMP			.
2835	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2005. CB-RM-40-0009	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2840	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 3001. IH 94 RAMPS & STH 181	LUMP	LUMP			.
2845	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 3002. USH 45 RAMPS & USH 18	LUMP	LUMP			.
2850	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0001. (HL-40-UN)	LUMP	LUMP			.
2855	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0002. (WASHINGTON - WT)	LUMP	LUMP			.
2860	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0003. (HL-40-WB)	LUMP	LUMP			.
2865	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0004. (HL-40-AD)	LUMP	LUMP			.
2870	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0005. (HL-40-DX)	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	656.0400 ELECTRICAL					
2875	SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0006. (HL-40-ZE/QR)	LUMP	LUMP			.
	656.0400 ELECTRICAL					
2880	SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0007. (HL-40-TA)	LUMP	LUMP			.
	656.0500 ELECTRICAL					
2885	SERVICE BREAKER DISCONNECT BOX (LOCATION) 2001. CB-CCTV-40-0099	LUMP	LUMP			.
	656.0500 ELECTRICAL					
2890	SERVICE BREAKER DISCONNECT BOX (LOCATION) 2002. CB-SDS-40-0051	LUMP	LUMP			.
	656.0500 ELECTRICAL					
2895	SERVICE BREAKER DISCONNECT BOX (LOCATION) 2003. CB-SDS-40-0227	LUMP	LUMP			.
	656.0500 ELECTRICAL					
2900	SERVICE BREAKER DISCONNECT BOX (LOCATION) 2004. CB-RM-40-0010	LUMP	LUMP			.
	656.0500 ELECTRICAL					
2905	SERVICE BREAKER DISCONNECT BOX (LOCATION) 2005. CB-CCTV-40-0141	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2910	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2006. CB-SDS-40-0228	LUMP	LUMP			.
2915	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2007. CB-RM-40-0009	LUMP	LUMP			.
2920	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2008. CB-DMS-40-0132	LUMP	LUMP			.
2925	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2009. CB-DMS-40-0019	LUMP	LUMP			.
2930	657.0100 PEDESTAL BASES	31.000 EACH	.			.
2935	657.0210 TRANSFORMER BASES BREAKAWAY 15-17 INCH BOLT CIRCLE	16.000 EACH	.			.
2940	657.0255 TRANSFORMER BASES BREAKAWAY 11 1/2-INCH BOLT CIRCLE	115.000 EACH	.			.
2945	657.0305 POLES TYPE 2	3.000 EACH	.			.
2950	657.0310 POLES TYPE 3	2.000 EACH	.			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2955	657.0322 POLES TYPE 5-ALUMINUM	143.000 EACH		.		.
2960	657.0375 POLES TYPE A	16.000 EACH		.		.
2965	657.0405 TRAFFIC SIGNAL STANDARDS ALUMINUM 3.5-FT	6.000 EACH		.		.
2970	657.0420 TRAFFIC SIGNAL STANDARDS ALUMINUM 13-FT	13.000 EACH		.		.
2975	657.0425 TRAFFIC SIGNAL STANDARDS ALUMINUM 15-FT	5.000 EACH		.		.
2980	657.0430 TRAFFIC SIGNAL STANDARDS ALUMINUM 10-FT	9.000 EACH		.		.
2985	657.0605 LUMINAIRE ARMS SINGLE MEMBER 4 1/2-INCH CLAMP 4-FT	28.000 EACH		.		.
2990	657.0609 LUMINAIRE ARMS SINGLE MEMBER 4-INCH CLAMP 6-FT	2.000 EACH		.		.
2995	657.0610 LUMINAIRE ARMS SINGLE MEMBER 4 1/2-INCH CLAMP 6-FT	145.000 EACH		.		.
3000	657.0620 LUMINAIRE ARMS SINGLE MEMBER 6-INCH CLAMP 4-FT	34.000 EACH		.		.
3005	657.1345 INSTALL POLES TYPE 9	5.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3010	657.1350 INSTALL POLES TYPE 10	3.000 EACH		.		.
3015	657.1355 INSTALL POLES TYPE 12	8.000 EACH		.		.
3020	657.1515 INSTALL MONOTUBE ARMS 15-FT	1.000 EACH		.		.
3025	657.1520 INSTALL MONOTUBE ARMS 20-FT	2.000 EACH		.		.
3030	657.1530 INSTALL MONOTUBE ARMS 30-FT	5.000 EACH		.		.
3035	657.1535 INSTALL MONOTUBE ARMS 35-FT	3.000 EACH		.		.
3040	657.1540 INSTALL MONOTUBE ARMS 40-FT	1.000 EACH		.		.
3045	657.1545 INSTALL MONOTUBE ARMS 45-FT	1.000 EACH		.		.
3050	657.1550 INSTALL MONOTUBE ARMS 50-FT	2.000 EACH		.		.
3055	657.1555 INSTALL MONOTUBE ARMS 55-FT	1.000 EACH		.		.
3060	657.1808 INSTALL LUMINAIRE ARMS STEEL 8-FT	3.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3065	657.6005.S ANCHOR ASSEMBLIES LIGHT POLES ON STRUCTURES	43.000 EACH		.		.
3070	658.0110 TRAFFIC SIGNAL FACE 3-12 INCH VERTICAL	64.000 EACH		.		.
3075	658.0115 TRAFFIC SIGNAL FACE 4-12 INCH VERTICAL	9.000 EACH		.		.
3080	658.0215 BACKPLATES SIGNAL FACE 3 SECTION 12-INCH	64.000 EACH		.		.
3085	658.0220 BACKPLATES SIGNAL FACE 4 SECTION 12-INCH	9.000 EACH		.		.
3090	658.0416 PEDESTRIAN SIGNAL FACE 16-INCH	32.000 EACH		.		.
3095	658.0500 PEDESTRIAN PUSH BUTTONS	40.000 EACH		.		.
3100	658.0600 LED MODULES 12-INCH RED BALL	56.000 EACH		.		.
3105	658.0605 LED MODULES 12-INCH YELLOW BALL	54.000 EACH		.		.
3110	658.0610 LED MODULES 12-INCH GREEN BALL	48.000 EACH		.		.
3115	658.0615 LED MODULES 12-INCH RED ARROW	17.000 EACH		.		.

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3120	658.0620 LED MODULES 12-INCH YELLOW ARROW	25.000 EACH		.		.
3125	658.0625 LED MODULES 12-INCH GREEN ARROW	28.000 EACH		.		.
3130	658.0635 LED MODULES PEDESTRIAN COUNTDOWN TIMER 16-INCH	32.000 EACH		.		.
3135	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3001. IH 94 RAMPS & STH 181	LUMP	LUMP			.
3140	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3002. USH 45 RAMPS & USH 18	LUMP	LUMP			.
3145	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3003. USH 18 & N. 95TH STREET	LUMP	LUMP			.
3150	659.0802 PLAQUES SEQUENCE IDENTIFICATION	251.000 EACH		.		.
3155	659.1120 LUMINAIRES UTILITY LED B	156.000 EACH		.		.
3160	659.1130 LUMINAIRES UTILITY LED D	76.000 EACH		.		.
3165	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3001. IH 94 EB RAMPS & STH 181	LUMP	LUMP			.

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3170	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3002. IH 94 WB RAMPS & STH 181	LUMP	LUMP			.
3175	661.0300 GENERATORS	4.000 DAY	.			.
3180	662.1028.S RAMP CLOSURE GATES HARDWIRED 28-FT	1.000 EACH	.			.
3185	662.1037.S RAMP CLOSURE GATES HARDWIRED 37-FT	2.000 EACH	.			.
3190	662.1040.S RAMP CLOSURE GATES HARDWIRED 40-FT	1.000 EACH	.			.
3195	670.0100 FIELD SYSTEM INTEGRATOR 2001. FTMS	LUMP	LUMP			.
3200	670.0100 FIELD SYSTEM INTEGRATOR 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3205	670.0100 FIELD SYSTEM INTEGRATOR 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3210	670.0200 ITS DOCUMENTATION 2001. FTMS	LUMP	LUMP			.
3215	670.0200 ITS DOCUMENTATION 3001. STH 181 CORRIDOR	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3220	670.0200 ITS DOCUMENTATION 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3225	671.0132 CONDUIT HDPE 3-DUCT 2-INCH	4,125.000 LF		.		.
3230	672.0100 BASE ITS CONTROLLER CABINET	3.000 EACH		.		.
3235	672.0250 BASE CAMERA POLE 50-FT	3.000 EACH		.		.
3240	672.0280 BASE CAMERA POLE 80-FT	1.000 EACH		.		.
3245	673.0105 COMMUNICATION VAULT TYPE 1	20.000 EACH		.		.
3250	673.0200.S INSTALL ITS FIELD CABINET	3.000 EACH		.		.
3255	673.0225.S INSTALL POLE MOUNTED CABINET	8.000 EACH		.		.
3260	674.0112 CABLE ITS COMMUNICATION 12 PAIR	874.000 LF		.		.
3265	674.0125 CABLE ITS COMMUNICATION 25 PAIR	1,249.000 LF		.		.
3270	674.0200 CABLE MICROWAVE DETECTOR	9,340.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3275	674.0300 REMOVE CABLE	38,930.000 LF		.		.
3280	675.0100 INSTALL CONTROLLER RAMP METER PROCESSOR ASSEMBLY	3.000 EACH		.		.
3285	675.0300 INSTALL MOUNTED CONTROLLER MICROWAVE DETECTOR ASSEMBLY	17.000 EACH		.		.
3290	675.0400.S INSTALL ETHERNET SWITCH	8.000 EACH		.		.
3295	676.0100 SIGNAL ASSEMBLY RAMP CONTROL SIDEMOUNT	5.000 EACH		.		.
3300	676.0105 SIGNAL ASSEMBLY RAMP CONTROL OVERHEAD	2.000 EACH		.		.
3305	676.0300 SIGNAL ASSEMBLY ADVANCE FLASHER TYPE 1	6.000 EACH		.		.
3310	676.9001.S REMOVING ADVANCE FLASHER ASSEMBLIES TYPE 1	7.000 EACH		.		.
3315	677.0100 INSTALL CAMERA POLE	3.000 EACH		.		.
3320	677.0200 INSTALL CAMERA ASSEMBLY	4.000 EACH		.		.
3325	677.0300.S INSTALL VIDEO ENCODER	4.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3330	677.9051.S REMOVING 50-FOOT CAMERA POLE	3.000 EACH		.		.
3335	677.9200.S REMOVING CCTV CAMERA	3.000 EACH		.		.
3340	678.0006 INSTALL FIBER OPTIC CABLE OUTDOOR PLANT 6-CT	11,775.000 LF		.		.
3345	678.0072 INSTALL FIBER OPTIC CABLE OUTDOOR PLANT 72-CT	10,720.000 LF		.		.
3350	678.0100.S INSTALL OVERHEAD FREEWAY DMS FULL MATRIX	2.000 EACH		.		.
3355	678.0300 FIBER OPTIC SPLICE	423.000 EACH		.		.
3360	678.0400 FIBER OPTIC TERMINATION	76.000 EACH		.		.
3365	678.0500 COMMUNICATION SYSTEM TESTING 2001. FTMS	LUMP	LUMP			.
3370	678.0500 COMMUNICATION SYSTEM TESTING 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3375	678.0500 COMMUNICATION SYSTEM TESTING 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3380	690.0150 SAWING ASPHALT	5,290.000 LF		.		.

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3385	690.0250 SAWING CONCRETE	47,211.000 LF		.		.
3390	715.0415 INCENTIVE STRENGTH CONCRETE PAVEMENT	102,710.000 DOL	1.00000		102710.00	
3395	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	182,144.000 DOL	1.00000		182144.00	
3400	ASP.1T0A ON-THE-JOB TRAINING APPRENTICE AT $5.00/HR	800.000 HRS	5.00000		4000.00	
3405	ASP.1T0G ON-THE-JOB TRAINING GRADUATE AT $5.00/HR	3,000.000 HRS	5.00000		15000.00	
3410	SPV.0035 SPECIAL 0100. EBS EXCAVATION	46,788.000 CY		.		.
3415	SPV.0035 SPECIAL 0101. EBS BACKFILL	46,549.000 CY		.		.
3420	SPV.0035 SPECIAL 0700. EXCAVATION, HAULING, AND REUSE OF SOLID WASTE SOIL	16,574.000 CY		.		.
3425	SPV.0035 SPECIAL 4000. HPC MASONRY STRUCTURES **P**	11,677.500 CY		.		.
3430	SPV.0035 SPECIAL 4010. CONCRETE MASONRY SOLDIER PILE FOOTINGS **P**	2,705.000 CY		.		.

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3435	SPV.0035 SPECIAL 4020. LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 1	12,896.000 CY		.		.
3440	SPV.0035 SPECIAL 4030. LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 2	4,034.000 CY		.		.
3445	SPV.0045 SPECIAL 0100. TEMPORARY CROSSWALK/SIDEWALK	600.000 DAY		.		.
3450	SPV.0045 SPECIAL 0400. TRUCK OR TRAILER MOUNTED ATTENUATOR	500.000 DAY		.		.
3455	SPV.0045 SPECIAL 0401. PORTABLE SPEED TRAILER	1,926.000 DAY		.		.
3460	SPV.0045 SPECIAL 2000. DYNAMIC LATE MERGE SYSTEM	465.000 DAY		.		.
3465	SPV.0045 SPECIAL 2001. WORK ZONE CONSTRUCTION TRAFFIC MERGE WARNING SYSTEM	932.000 DAY		.		.
3470	SPV.0060 SPECIAL 0003. EXPOSING EXISTING UTILITY UNPAVED AREA	150.000 EACH		.		.
3475	SPV.0060 SPECIAL 0004. EXPOSING EXISTING UTILITY PAVED AREA	150.000 EACH		.		.
3480	SPV.0060 SPECIAL 0005. BASELINE CPM PROGRESS SCHEDULE	1.000 EACH		.		.

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3485	SPV.0060 SPECIAL 0006. MONTHLY CPM PROGRESS SCHEDULE UPDATES	20.000 EACH		.		.
3490	SPV.0060 SPECIAL 0010. REMOVING HIGH MAST LIGHTING TOWER CONCRETE BASE	5.000 EACH		.		.
3495	SPV.0060 SPECIAL 0011. REMOVING HIGH MAST LIGHTING TOWER	3.000 EACH		.		.
3500	SPV.0060 SPECIAL 0012. REMOVING GROUT PIPE	7.000 EACH		.		.
3505	SPV.0060 SPECIAL 0015. REMOVING UTILITY VAULT	26.000 EACH		.		.
3510	SPV.0060 SPECIAL 0021. REMOVING OLD SIGN STRUCTURE S-40-155	1.000 EACH		.		.
3515	SPV.0060 SPECIAL 0022. REMOVING OLD SIGN STRUCTURE S-40-164	1.000 EACH		.		.
3520	SPV.0060 SPECIAL 0023. REMOVING OLD SIGN STRUCTURE S-40-200	1.000 EACH		.		.
3525	SPV.0060 SPECIAL 0024. REMOVING OLD SIGN STRUCTURE S-40-203	1.000 EACH		.		.
3530	SPV.0060 SPECIAL 0025. REMOVING OLD SIGN STRUCTURE S-40-230	1.000 EACH		.		.

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3535	SPV.0060 SPECIAL 0026. REMOVING OLD SIGN STRUCTURE S-40-262	1.000 EACH		.		.
3540	SPV.0060 SPECIAL 0027. REMOVING OLD SIGN STRUCTURE S-40-27	1.000 EACH		.		.
3545	SPV.0060 SPECIAL 0028. REMOVING OLD SIGN STRUCTURE S-40-308	1.000 EACH		.		.
3550	SPV.0060 SPECIAL 0029. REMOVING OLD SIGN STRUCTURE S-40-310	1.000 EACH		.		.
3555	SPV.0060 SPECIAL 0030. REMOVING OLD SIGN STRUCTURE S-40-311	1.000 EACH		.		.
3560	SPV.0060 SPECIAL 0031. REMOVING OLD SIGN STRUCTURE S-40-312	1.000 EACH		.		.
3565	SPV.0060 SPECIAL 0032. REMOVING OLD SIGN STRUCTURE S-40-33	1.000 EACH		.		.
3570	SPV.0060 SPECIAL 0033. REMOVING OLD SIGN STRUCTURE S-40-36	1.000 EACH		.		.
3575	SPV.0060 SPECIAL 0034. REMOVING OLD SIGN STRUCTURE S-40-37	1.000 EACH		.		.
3580	SPV.0060 SPECIAL 0035. REMOVING OLD SIGN STRUCTURE S-40-38	1.000 EACH		.		.
3585	SPV.0060 SPECIAL 0036. REMOVING OLD SIGN STRUCTURE S-40-391	1.000 EACH		.		.

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3590	SPV.0060 SPECIAL 0037. REMOVING OLD SIGN STRUCTURE S-40-408	1.000 EACH		.		.
3595	SPV.0060 SPECIAL 0038. REMOVING OLD SIGN STRUCTURE S-40-954	1.000 EACH		.		.
3600	SPV.0060 SPECIAL 0039. REMOVING OLD SIGN STRUCTURE S-40-202	1.000 EACH		.		.
3605	SPV.0060 SPECIAL 0040. REMOVING OLD SIGN STRUCTURE S-40-279	1.000 EACH		.		.
3610	SPV.0060 SPECIAL 0041. REMOVING OLD SIGN STRUCTURE S-40-48	1.000 EACH		.		.
3615	SPV.0060 SPECIAL 0042. REMOVING OLD SIGN STRUCTURE S-40-379	1.000 EACH		.		.
3620	SPV.0060 SPECIAL 0100. SALVAGING CRASH CUSHION	6.000 EACH		.		.
3625	SPV.0060 SPECIAL 0101. TEMPORARY BUS STOP PAD	10.000 EACH		.		.
3630	SPV.0060 SPECIAL 0104. PARKING LOT BOLLARD	8.000 EACH		.		.
3635	SPV.0060 SPECIAL 0125. CONCRETE BARRIER TYPE S56 SPECIAL LIGHT POLE BASE	13.000 EACH		.		.

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3640	SPV.0060 SPECIAL 0126. CONCRETE BARRIER TYPE S56A SPECIAL LIGHT POLE BASE	11.000 EACH		.		.
3645	SPV.0060 SPECIAL 0127. CONCRETE BARRIER TRANSITION TYPE G1	1.000 EACH		.		.
3650	SPV.0060 SPECIAL 0128. CONCRETE BARRIER TRANSITION TYPE G2	1.000 EACH		.		.
3655	SPV.0060 SPECIAL 0129. CONCRETE BARRIER TRANSITION TYPE G3	1.000 EACH		.		.
3660	SPV.0060 SPECIAL 0130. CONCRETE BARRIER TRANSITION TYPE G4	1.000 EACH		.		.
3665	SPV.0060 SPECIAL 0131. CONCRETE BARRIER TRANSITION TYPE G5	1.000 EACH		.		.
3670	SPV.0060 SPECIAL 0132. CONCRETE BARRIER TRANSITION TYPE G6	1.000 EACH		.		.
3675	SPV.0060 SPECIAL 0133. CONCRETE BARRIER TRANSITION TYPE G7	1.000 EACH		.		.
3680	SPV.0060 SPECIAL 0134. CONCRETE BARRIER TRANSITION TYPE G8	1.000 EACH		.		.
3685	SPV.0060 SPECIAL 0135. CONCRETE BARRIER TRANSITION TYPE G9	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3690	SPV.0060 SPECIAL 0136. CONCRETE BARRIER TRANSITION TYPE G10	1.000 EACH		.		.
3695	SPV.0060 SPECIAL 0137. CONCRETE BARRIER TRANSITION TYPE G11	1.000 EACH		.		.
3700	SPV.0060 SPECIAL 0138. CONCRETE BARRIER TRANSITION TYPE G12	1.000 EACH		.		.
3705	SPV.0060 SPECIAL 0150. CONCRETE BARRIER TRANSITION TYPE M1	5.000 EACH		.		.
3710	SPV.0060 SPECIAL 0151. CONCRETE BARRIER TRANSITION TYPE M2	1.000 EACH		.		.
3715	SPV.0060 SPECIAL 0152. CONCRETE BARRIER TRANSITION TYPE M3	2.000 EACH		.		.
3720	SPV.0060 SPECIAL 0300. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS, TYPE 1 **P**	13.000 EACH		.		.
3725	SPV.0060 SPECIAL 0301. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS, TYPE 2 **P**	38.000 EACH		.		.
3730	SPV.0060 SPECIAL 0302. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS, TYPE 3 **P**	11.000 EACH		.		.
3735	SPV.0060 SPECIAL 0303. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC WORDS **P**	30.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3740	SPV.0060 SPECIAL 0304. PAVEMENT MARKING GROOVED CONTRAST PREFORMED THERMOPLASTIC ARROWS, TYPE 2	8.000 EACH		.		.
3745	SPV.0060 SPECIAL 0305. PAVEMENT MARKING GROOVED CONTRAST PREFORMED THERMOPLASTIC WORDS	8.000 EACH		.		.
3750	SPV.0060 SPECIAL 0306. PAVEMENT MARKING GROOVED CONTRAST PREFORMED THERMOPLASTIC ARROWS TYPE 4	7.000 EACH		.		.
3755	SPV.0060 SPECIAL 0400. TRAFFIC CONTROL CLOSE-OPEN FREEWAY ENTRANCE RAMP	100.000 EACH		.		.
3760	SPV.0060 SPECIAL 0401. TRAFFIC CONTROL CLOSE-OPEN FREEWAY TO FREEWAY SYSTEM RAMP	50.000 EACH		.		.
3765	SPV.0060 SPECIAL 0402. TRAFFIC CONTROL INTERIM FREEWAY LANE CLOSURE	300.000 EACH		.		.
3770	SPV.0060 SPECIAL 0403. TRAFFIC CONTROL LOCAL ROAD LANE CLOSURES	30.000 EACH		.		.
3775	SPV.0060 SPECIAL 0404. TRAFFIC CONTROL COVERING SIGNS TYPE I LEFT IN PLACE	27.000 EACH		.		.
3780	SPV.0060 SPECIAL 0405. TEMPORARY SIGN PORTABLE SUPPORT	11.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3785	SPV.0060 SPECIAL 0406. MOBILIZATIONS EMERGENCY PAVEMENT REPAIR	8.000 EACH		.		.
3790	SPV.0060 SPECIAL 0407. INSTALLING STATE FURNISHED SIGNS	263.000 EACH		.		.
3795	SPV.0060 SPECIAL 0500. TRAFFIC CONTROL DRUMS LEFT IN PLACE	664.000 EACH		.		.
3800	SPV.0060 SPECIAL 0501. TRAFFIC CONTROL BARRICADES TYPE II LEFT IN PLACE	7.000 EACH		.		.
3805	SPV.0060 SPECIAL 0502. TRAFFIC CONTROL BARRICADES TYPE III LEFT IN PLACE	66.000 EACH		.		.
3810	SPV.0060 SPECIAL 0503. TRAFFIC CONTROL WARNING LIGHTS TYPE A LEFT IN PLACE	132.000 EACH		.		.
3815	SPV.0060 SPECIAL 0504. TRAFFIC CONTROL WARNING LIGHTS TYPE C LEFT IN PLACE	99.000 EACH		.		.
3820	SPV.0060 SPECIAL 0505. TRAFFIC CONTROL SIGNS LEFT IN PLAC	103.000 EACH		.		.
3825	SPV.0060 SPECIAL 0506. TRAFFIC CONTROL DETOUR SIGNS LEFT IN PLACE	815.000 EACH		.		.
3830	SPV.0060 SPECIAL 0507. CRASH CUSHION TEMPORARY LEFT IN PLACE	36.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3835	SPV.0060 SPECIAL 0800. SURFACE SETTLEMENT PLATES	4.000 EACH		.		.
3840	SPV.0060 SPECIAL 0900. LED PARKING LOT LIGHTING ASSEMBLY	3.000 EACH		.		.
3845	SPV.0060 SPECIAL 0902. REMOVING EXISTING FLOODLIGHT ASSEMBLY	4.000 EACH		.		.
3850	SPV.0060 SPECIAL 0903. RELOCATING EXISTING LIGHTING ASSEMBLY	3.000 EACH		.		.
3855	SPV.0060 SPECIAL 1010. LAMP DISPOSAL HIGH INTENSITY DISCHARGE	253.000 EACH		.		.
3860	SPV.0060 SPECIAL 1019. RELOCATING LIGHT POLES, ARMS AND LUMINAIRES	4.000 EACH		.		.
3865	SPV.0060 SPECIAL 1020. SALVAGING LIGHT POLES AND ARMS - WEST ALLIS	11.000 EACH		.		.
3870	SPV.0060 SPECIAL 1021. SALVAGING LIGHT POLES, ARMS AND LUMINAIRES - WEST ALLIS	14.000 EACH		.		.
3875	SPV.0060 SPECIAL 1031. REMOVING ALUMINUM LIGHT POLES, AND ARMS - WAUWATOSA	9.000 EACH		.		.
3880	SPV.0060 SPECIAL 1032. REMOVING CONCRETE LIGHT POLES, AND ARMS - WAUWATOSA	5.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3885	SPV.0060 SPECIAL 1033. REMOVING ALUMINUM LIGHT POLES, ARMS AND LUMINAIRES	105.000 EACH		.		.
3890	SPV.0060 SPECIAL 1035. WOOD POLE LIGHTING 60-FT	70.000 EACH		.		.
3895	SPV.0060 SPECIAL 1036. POLES WOOD 60-FT	22.000 EACH		.		.
3900	SPV.0060 SPECIAL 1037. POLES WOOD 35-FT	2.000 EACH		.		.
3905	SPV.0060 SPECIAL 1038. MOVING POLES WOOD 60-FT AND FLOODLIGHTS	6.000 EACH		.		.
3910	SPV.0060 SPECIAL 1040. REMOVING POLES WOOD 60-FT AND FLOODLIGHTS	38.000 EACH		.		.
3915	SPV.0060 SPECIAL 1041. REMOVING POLES WOOD 60-FT	10.000 EACH		.		.
3920	SPV.0060 SPECIAL 1051. PULL BOXES STEEL 24X42-INCH GROUNDED	3.000 EACH		.		.
3925	SPV.0060 SPECIAL 1056. JUNCTION BOXES 18X12X6-INCH COATED	17.000 EACH		.		.
3930	SPV.0060 SPECIAL 1065. LUMINAIRE UTILITY LED E	13.000 EACH		.		.

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3935	SPV.0060 SPECIAL 1070. LUMINAIRES FLOODLIGHT 1000W HPS	73.000 EACH		.		.
3940	SPV.0060 SPECIAL 1071. LUMINAIRES FLOODLIGHT 400W HPS	11.000 EACH		.		.
3945	SPV.0060 SPECIAL 1078. LUMINAIRE (UDL) WALLPACK LED	20.000 EACH		.		.
3950	SPV.0060 SPECIAL 1090. SALVAGE DISTRIBUTION CENTERS	5.000 EACH		.		.
3955	SPV.0060 SPECIAL 1096. LIGHTING CONTROL CABINET 240/480 VAC	4.000 EACH		.		.
3960	SPV.0060 SPECIAL 1100. LIGHTING CONTROL CABINET 480/277 VAC	3.000 EACH		.		.
3965	SPV.0060 SPECIAL 1101. CONCRETE CONTROL CABINET BASES, SPECIAL	8.000 EACH		.		.
3970	SPV.0060 SPECIAL 1130. POLES ALUMINUM TYPE F	14.000 EACH		.		.
3975	SPV.0060 SPECIAL 1131. CONCRETE BASES TYPE B	16.000 EACH		.		.
3980	SPV.0060 SPECIAL 1132. CONCRETE BASES TYPE 5L	2.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3985	SPV.0060 SPECIAL 1152. ELECTRICAL SERVICE METER BREAKER PEDESTAL TEMPORARY LIGHTING	1.000 EACH		.		.
3990	SPV.0060 SPECIAL 1153. REMOVING ELECTRICAL SERVICE METER BREAKER PEDESTAL LIGHTING	6.000 EACH		.		.
3995	SPV.0060 SPECIAL 2001. GROUND ROD	24.000 EACH		.		.
4000	SPV.0060 SPECIAL 2002. REMOVING RAMP CONTROL SIGNAL ASSEMBLY SIDEMOUNT	8.000 EACH		.		.
4005	SPV.0060 SPECIAL 2003. REMOVING CONTROLLER CABINET	8.000 EACH		.		.
4010	SPV.0060 SPECIAL 2004. REMOVING CONTROLLER CABINET BASE	8.000 EACH		.		.
4015	SPV.0060 SPECIAL 2005. REMOVING CONTROLLER RAMP METER PROCESSOR ASSEMBLY	4.000 EACH		.		.
4020	SPV.0060 SPECIAL 2006. REMOVING ELECTRICAL SERVICE METER BREAKER PEDESTAL	2.000 EACH		.		.
4025	SPV.0060 SPECIAL 2007. REMOVING COMMUNICATION VAULT	3.000 EACH		.		.
4030	SPV.0060 SPECIAL 2008. REMOVING OVERHEAD FREEWAY DMS	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4035	SPV.0060 SPECIAL 2009. REMOVING MICROWAVE DETECTOR ASSEMBLY	5.000 EACH		.		.
4040	SPV.0060 SPECIAL 2010. INSTALL PORTABLE VIDEO SURVEILLANCE SYSTEM	2.000 EACH		.		.
4045	SPV.0060 SPECIAL 2011. RELOCATING PORTABLE VIDEO SURVEILLANCE SYSTEM	4.000 EACH		.		.
4050	SPV.0060 SPECIAL 2012. INSTALL TEMPORARY VEHICLE DETECTOR ASSEMBLY	10.000 EACH		.		.
4055	SPV.0060 SPECIAL 2013. REFOCUSING TEMPORARY VEHICLE DETECTOR ASSEMBLY	45.000 EACH		.		.
4060	SPV.0060 SPECIAL 2014. REMOVING COMMUNICATION HUB BUILDING	1.000 EACH		.		.
4065	SPV.0060 SPECIAL 2015. REMOVING COMMUNICATION HUB BUILDING FOUNDATION	1.000 EACH		.		.
4070	SPV.0060 SPECIAL 2016. REMOVING ELECTRONIC BLANK OUT SIGN ASSEMBLY	2.000 EACH		.		.
4075	SPV.0060 SPECIAL 2017. INSTALL 5.8 GHZ ETHERNET BRIDGE	1.000 EACH		.		.
4080	SPV.0060 SPECIAL 2018. REMOVING ON-RAMP CLOSURE GATE	1.000 EACH		.		.

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4085	SPV.0060 SPECIAL 2019. INSTALL FIBER OPTIC MEDIA CONVERTER	12.000 EACH		.		.
4090	SPV.0060 SPECIAL 2020. INSTALLING CONDUIT INTO EXISTING MANHOLE	4.000 EACH		.		.
4095	SPV.0060 SPECIAL 2021. 4-FT DIAMETER MANHOLE TYPE TES	3.000 EACH		.		.
4100	SPV.0060 SPECIAL 2022. ADJUSTING TES MANHOLE	17.000 EACH		.		.
4105	SPV.0060 SPECIAL 2023. 4' DIAMETER "DOGHOUSE" MANHOLE TYPE TES	1.000 EACH		.		.
4110	SPV.0060 SPECIAL 2030. INSTALL CABINET HEATER AND THERMOSTAT	2.000 EACH		.		.
4115	SPV.0060 SPECIAL 2031. INSTALL WAVETRONIX CLICK 200 MODULE	4.000 EACH		.		.
4120	SPV.0060 SPECIAL 2032. INSTALL WAVETRONIX POWER MODULE	4.000 EACH		.		.
4125	SPV.0060 SPECIAL 2033. INSTALL WAVETRONIX DETECTOR MODULE	4.000 EACH		.		.
4130	SPV.0060 SPECIAL 2034. INSTALL CELLULAR ANTENNA	4.000 EACH		.		.
4135	SPV.0060 SPECIAL 2040. WIRELESS TRAFFIC SENSOR	11.000 EACH		.		.

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	SPV.0060 SPECIAL 2041.					
4140	WIRELESS TRAFFIC SENSOR ACCESS POINT	1.000 EACH		.		.
	SPV.0060 SPECIAL 2042.					
4145	WIRELESS TRAFFIC SENSOR REPEATER	2.000 EACH		.		.
	SPV.0060 SPECIAL 2043.					
4150	WIRELESS TRAFFIC SENSOR CONTACT CLOSURE MODULE	1.000 EACH		.		.
	SPV.0060 SPECIAL 2044.					
4155	WIRELESS TRAFFIC SENSOR CONTACT CLOSURE EXTENSION CARD	5.000 EACH		.		.
	SPV.0060 SPECIAL 2045.					
4160	ADJUSTING COMMUNICATION VAULT	1.000 EACH		.		.
	SPV.0060 SPECIAL 2046.					
4165	LOOP DETECTOR WIRE PROTECTION	7.000 EACH		.		.
	SPV.0060 SPECIAL 2047.					
4170	REMOVING TEMPORARY VEHICLE DETECTOR ASSEMBLY	7.000 EACH		.		.
	SPV.0060 SPECIAL 3001.					
4175	CONCRETE BASES TYPE 1 SPREAD FOOTING	3.000 EACH		.		.
	SPV.0060 SPECIAL 3002.					
4180	CONCRETE CONTROL CABINET BASE TYPE 9 SPECIAL (MOD)	2.000 EACH		.		.
	SPV.0060 SPECIAL 3005.					
4185	TRAFFIC SIGNAL VAULT	2.000 EACH		.		.

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4190	SPV.0060 SPECIAL 3103. TRAFFIC POLYMER CONCRETE VAULT 13-IN X 24-IN X 18-IN	7.000 EACH		.		.
4195	SPV.0060 SPECIAL 3104. TRAFFIC POLYMER CONCRETE VAULT 17-IN X 30-IN X 18-IN	1.000 EACH		.		.
4200	SPV.0060 SPECIAL 4100. ANCHOR ASSEMBLIES SIGN BRIDGE STRUCTURES	9.000 EACH		.		.
4205	SPV.0060 SPECIAL 4105. ANCHOR ASSEMBLIES NOISE BARRIER STRUCTURES	322.000 EACH		.		.
4210	SPV.0060 SPECIAL 4110. PILE DYNAMIC ANALYZER (PDA) TESTING	57.000 EACH		.		.
4215	SPV.0060 SPECIAL 4115. PILE DYNAMIC ANALYZER (PDA) RESTRIKES	57.000 EACH		.		.
4220	SPV.0060 SPECIAL 4120. BEARINGS HIGH-LOAD MULTI-ROTATIONAL FIXED	4.000 EACH		.		.
4225	SPV.0060 SPECIAL 4125. BEARINGS HIGH-LOAD MULTI-ROTATIONAL GUIDED	37.000 EACH		.		.
4230	SPV.0060 SPECIAL 4130. FLOOR DRAIN SPECIAL	7.000 EACH		.		.
4235	SPV.0060 SPECIAL 4140. ANCHOR SLAB INLET COVER SPECIAL	31.000 EACH		.		.

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4240	SPV.0060 SPECIAL 4150. TIEBACK ANCHORS	566.000 EACH		.		.
4245	SPV.0060 SPECIAL 4155. TIEBACK ANCHORS PERFORMANCE TESTS	29.000 EACH		.		.
4250	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	4.000 EACH		.		.
4255	SPV.0060 SPECIAL 4170. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 78.74-IN	4.000 EACH		.		.
4260	SPV.0060 SPECIAL 4175. THERMAL INTEGRITY PROFILER (TIP) TESTING WALL SECANT PILE 47. 24-IN	3.000 EACH		.		.
4265	SPV.0060 SPECIAL 4180. PRECAST BEAMS	2.000 EACH		.		.
4270	SPV.0060 SPECIAL 4190. CONCRETE POLYMER PULL BOX	8.000 EACH		.		.
4275	SPV.0060 SPECIAL 4195. CONCRETE BASE SLEEVES	2.000 EACH		.		.
4280	SPV.0060 SPECIAL 5000. REMOVING HYDRANT	27.000 EACH		.		.
4285	SPV.0060 SPECIAL 5001. INSTALL HYDRANT	27.000 EACH		.		.

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4290	SPV.0060 SPECIAL 5002. CONNECT ORIGINAL SERVICE (C.O.S.)	52.000 EACH		.		.
4295	SPV.0060 SPECIAL 5003. REPLACE ORIGINAL SERVICE (R.O.S)	9.000 EACH		.		.
4300	SPV.0060 SPECIAL 5004. ADJUSTING WATER VALVE	54.000 EACH		.		.
4305	SPV.0060 SPECIAL 5005. ROADWAY SERVICE BOX (R.S.B.)	1.000 EACH		.		.
4310	SPV.0060 SPECIAL 5007. 72-INCH PRECAST VALVE VAULT WITH 24-INCH D.D. GATE VALVE	2.000 EACH		.		.
4315	SPV.0060 SPECIAL 5008. PERMANENT CONNECTION TO EXISTING 24-INCH WATER MAIN	3.000 EACH		.		.
4320	SPV.0060 SPECIAL 5009. TEMPORARY CONNECTION TO EXISTING 24-INCH WATER MAIN	1.000 EACH		.		.
4325	SPV.0060 SPECIAL 5010. GROUND HYDRANT ASSEMBLY	2.000 EACH		.		.
4330	SPV.0060 SPECIAL 5011. ADJUSTING SANITARY MANHOLE	46.000 EACH		.		.
4335	SPV.0060 SPECIAL 5013. RECONSTRUCT SANITARY MANHOLE	3.000 EACH		.		.

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4340	SPV.0060 SPECIAL 5100. SAN SEWER DROP MH PRECAST CONC 48-INCH W/ CASTING	5.000 EACH		.		.
4345	SPV.0060 SPECIAL 5101. SAN SEWER MH PRECAST CONC 48-INCH W/ CASTING	30.000 EACH		.		.
4350	SPV.0060 SPECIAL 5102. SANITARY MANHOLE VACUUM TESTING	35.000 EACH		.		.
4355	SPV.0060 SPECIAL 5103. REMOVING SANITARY MANHOLE	20.000 EACH		.		.
4360	SPV.0060 SPECIAL 5104. ABANDONING SANITARY MANHOLE	3.000 EACH		.		.
4365	SPV.0060 SPECIAL 5107. PARTIAL ABANDONMENT OF MMSD SANITARY MANHOLE	1.000 EACH		.		.
4370	SPV.0060 SPECIAL 5108. ABANDONING MMSD ACCESS PANEL	1.000 EACH		.		.
4375	SPV.0060 SPECIAL 8004. INLET COVERS TYPE 57	12.000 EACH		.		.
4380	SPV.0060 SPECIAL 8005. COVER PLATE LEFT IN PLACE	42.000 EACH		.		.
4385	SPV.0060 SPECIAL 8007. RECONNECT STORM SEWER LATERALS	115.000 EACH		.		.
4390	SPV.0060 SPECIAL 8012. MANHOLES 9-FT SPECIAL	30.000 EACH		.		.

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	SPV.0060 SPECIAL 8013.					
4395	MANHOLES 10-FT SPECIAL	12.000 EACH		.		.
	SPV.0060 SPECIAL 8015.					
4400	PIPE CONNECTION TO EXISTING STRUCTURE	43.000 EACH		.		.
	SPV.0060 SPECIAL 8017.					
4405	SEDIMENTATION BASIN	16.000 EACH		.		.
	SPV.0060 SPECIAL 8018.					
4410	REMOVING BULKHEAD	6.000 EACH		.		.
	SPV.0060 SPECIAL 8040.					
4415	EMERGENCY SHAFT	2.000 EACH		.		.
	SPV.0060 SPECIAL 8050.					
4420	INLET COVERS TYPE 27-M	127.000 EACH		.		.
	SPV.0060 SPECIAL 8052.					
4425	REMOVING WELDS FROM STORM SEWER COVERS	9.000 EACH		.		.
	SPV.0060 SPECIAL 8062.					
4430	REMOVE AND CAP EXISTING DRAINAGE STORM SEWER STRUCTURE	12.000 EACH		.		.
	SPV.0060 SPECIAL 8080.					
4435	WELDING SEWER ACCESS COVERS	26.000 EACH		.		.
	SPV.0060 SPECIAL 8500.					
4440	STORM SEWER STRUCTURE Z813	1.000 EACH		.		.

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4445	SPV.0060 SPECIAL 8501. STORM SEWER STRUCTURE Z2822	1.000 EACH		.		.
4450	SPV.0060 SPECIAL 8502. STORM SEWER STRUCTURE Z4048	1.000 EACH		.		.
4455	SPV.0060 SPECIAL 8503. STORM SEWER STRUCTURE Z4619	1.000 EACH		.		.
4460	SPV.0060 SPECIAL 8504. STORM SEWER STRUCTURE Z4621	1.000 EACH		.		.
4465	SPV.0060 SPECIAL 8505. STORM SEWER STRUCTURE Z5348	1.000 EACH		.		.
4470	SPV.0060 SPECIAL 8506. STORM SEWER STRUCTURE Z6374	1.000 EACH		.		.
4475	SPV.0060 SPECIAL 8507. STORM SEWER STRUCTURE Z6382	1.000 EACH		.		.
4480	SPV.0060 SPECIAL 8508. STORM SEWER STRUCTURE Z6661	1.000 EACH		.		.
4485	SPV.0060 SPECIAL 8509. STORM SEWER STRUCTURE Z6666D	1.000 EACH		.		.
4490	SPV.0060 SPECIAL 8510. STORM SEWER STRUCTURE Z6707	1.000 EACH		.		.
4495	SPV.0060 SPECIAL 8511. STORM SEWER STRUCTURE Z6725	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4500	SPV.0060 SPECIAL 8512. STORM SEWER STRUCTURE Z6753A	1.000 EACH		.		.
4505	SPV.0060 SPECIAL 8513. STORM SEWER STRUCTURE Z6753C	1.000 EACH		.		.
4510	SPV.0060 SPECIAL 8514. STORM SEWER STRUCTURE Z6764	1.000 EACH		.		.
4515	SPV.0060 SPECIAL 8515. STORM SEWER STRUCTURE Z6828	1.000 EACH		.		.
4520	SPV.0060 SPECIAL 8516. STORM SEWER STRUCTURE Z6852	1.000 EACH		.		.
4525	SPV.0060 SPECIAL 8517. STORM SEWER STRUCTURE Z6647	1.000 EACH		.		.
4530	SPV.0060 SPECIAL 8518. STORM SEWER STRUCTURE Z6390	1.000 EACH		.		.
4535	SPV.0060 SPECIAL 8519. STORM SEWER STRUCTURE Z7945	1.000 EACH		.		.
4540	SPV.0075 SPECIAL 0010. OBSTRUCTIONS TRENCHLESS UTILITY CONSTRUCTION	15.000 HRS		.		.
4545	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	62.000 HRS		.		.
4550	SPV.0075 SPECIAL 4205. OBSTRUCTIONS WALL SECANT PILE	12.000 HRS		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4555	SPV.0075 SPECIAL 4210. OBSTRUCTIONS FOUNDATION DRILLING	72.000 HRS		.		.
4560	SPV.0075 SPECIAL 4215. OBSTRUCTIONS SIGN SUPPORTS CONCRETE MASONRY	44.000 HRS		.		.
4565	SPV.0075 SPECIAL 8097. OBSTRUCTIONS TUNNEL EXCAVATION	44.000 HRS		.		.
4570	SPV.0085 SPECIAL 0200. SEEDING MIXTURE NATIVE SEED BUTTERFLY MIX	145.000 LB		.		.
4575	SPV.0085 SPECIAL 0900. ICE HPC HOT WEATHER CONCRETING	1,269,600 LB	0.75000		952200.00	
4580	SPV.0085 SPECIAL 4300. BAR STEEL REINFORCEMENT HS STAINLESS BRIDGES	700,224.000 LB		.		.
4585	SPV.0085 SPECIAL 4310. POST-TENSIONING INTEGRAL PIER CAP	8,795.000 LB		.		.
4590	SPV.0090 SPECIAL 0010. REMOVING PAVEMENT MARKINGS WATER BLASTING	10,000.000 LF		.		.
4595	SPV.0090 SPECIAL 0011. REMOVING CONCRETE BARRIER TEMPORARY PRECAST	12,100.000 LF		.		.
4600	SPV.0090 SPECIAL 0012. REMOVING TEMPORARY SHORING LEFT IN PLACE	122.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0090 SPECIAL 0014.					
4605	REMOVING STEEL PIPE	775.000 LF		.		.
	SPV.0090 SPECIAL 0015.					
4610	REMOVING WATER PIPE	700.000 LF		.		.
	SPV.0090 SPECIAL 0016.					
4615	REMOVING CONCRETE ENCASED DUCT BANK	6,043.000 LF		.		.
	SPV.0090 SPECIAL 0100.					
4620	CONCRETE BARRIER TYPE S42C WITH 48-INCH PAN **P**	1,033.000 LF		.		.
	SPV.0090 SPECIAL 0101.					
4625	CONCRETE BARRIER TYPE S56 SPECIAL **P**	1,867.000 LF		.		.
	SPV.0090 SPECIAL 0102.					
4630	CONCRETE BARRIER TYPE S56A SPECIAL **P**	2,378.000 LF		.		.
	SPV.0090 SPECIAL 0103.					
4635	CONCRETE BARRIER TYPE S42 WITH 24-INCH PAN **P**	6,786.000 LF		.		.
	SPV.0090 SPECIAL 0104.					
4640	CONCRETE BARRIER VERTICAL BACK TYPE S42-INCH MOD WITH 24-INCH PAN **P**	3,340.000 LF		.		.
	SPV.0090 SPECIAL 0105.					
4645	CONCRETE BARRIER TYPE S56 WITH 24-INCH PAN **P**	250.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4650	SPV.0090 SPECIAL 0125. MAINTAIN CONCRETE BARRIER TEMPORARY PRECAST	23,555.000 LF		.		.
4655	SPV.0090 SPECIAL 0126. PIPE UNDERDRAIN 6-INCH SPECIAL	65,601.000 LF		.		.
4660	SPV.0090 SPECIAL 0150. CONCRETE GUTTER SPECIAL **P**	1,507.000 LF		.		.
4665	SPV.0090 SPECIAL 0151. CONCRETE CURB & GUTTER 37-INCH **P**	81.000 LF		.		.
4670	SPV.0090 SPECIAL 0152. CONCRETE CURB & GUTTER 4-INCH SLOPED 60-INCH TYPE A **P**	1,076.000 LF		.		.
4675	SPV.0090 SPECIAL 0300. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC STOP LINE, 18-INCH **P**	68.000 LF		.		.
4680	SPV.0090 SPECIAL 0301. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC STOP LINE, 24-INCH **P**	1,013.000 LF		.		.
4685	SPV.0090 SPECIAL 0302. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC CROSSWALK, 6-INCH **P**	823.000 LF		.		.
4690	SPV.0090 SPECIAL 0303. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC CROSSWALK, 12-INCH **P**	3,116.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4695	SPV.0090 SPECIAL 0305. PAVEMENT MARKING GROOVD PREFORMD THERMOPLASTIC ZEBRA MARKING, 24 IN **P**	36.000 LF		.		.
4700	SPV.0090 SPECIAL 0310. PAVEMENT MARKING CONTRAST EPOXY 7-INCH **P**	5,028.000 LF		.		.
4705	SPV.0090 SPECIAL 0311. PAVEMENT MARKING CONTRAST EPOXY 11-INCH **P**	718.000 LF		.		.
4710	SPV.0090 SPECIAL 0400. GLARE SCREENS TEMPORARY	3,263.000 LF		.		.
4715	SPV.0090 SPECIAL 0401. TRAFFIC CHANNELIZING CURB SYSTEM	760.000 LF		.		.
4720	SPV.0090 SPECIAL 0501. GLARE SCREENS TEMPORARY LEFT IN PLACE	2,698.000 LF		.		.
4725	SPV.0090 SPECIAL 0502. CONCRETE BARRIER TEMPORARY PRECAST DELIVERED SPECIAL **P**	39,835.000 LF		.		.
4730	SPV.0090 SPECIAL 0600. FENCE TEMPORARY 6-FT	1,060.000 LF		.		.
4735	SPV.0090 SPECIAL 0602. FENCE TEMPORARY LEFT IN PLACE 6-FT	1,834.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4740	SPV.0090 SPECIAL 0603. FENCE TEMPORARY LEFT IN PLACE 8-FT	1,603.000	LF		.		.
4745	SPV.0090 SPECIAL 0604. FENCE CHAIN LINK SCREENING 6-FT	5,435.000	LF		.		.
4750	SPV.0090 SPECIAL 0900. MINOR RETAINING WALL R-1	331.000	LF		.		.
4755	SPV.0090 SPECIAL 0901. MINOR RETAINING WALL R-2	154.000	LF		.		.
4760	SPV.0090 SPECIAL 1005. CABLE AERIAL ALUMINUM 6 AWG QUADRUPLEX	10,417.000	LF		.		.
4765	SPV.0090 SPECIAL 1006. CABLE AERIAL ALUMINUM 4 AWG QUADRUPLEX	9,538.000	LF		.		.
4770	SPV.0090 SPECIAL 1007. CABLE AERIAL ALUMINUM 2 AWG QUADRUPLEX	1,258.000	LF		.		.
4775	SPV.0090 SPECIAL 1009. CABLE AERIAL ALUMINUM 6 AWG TRIPLEX	496.000	LF		.		.
4780	SPV.0090 SPECIAL 1010. CABLE AERIAL ALUMINUM 4 AWG TRIPLEX	1,800.000	LF		.		.
4785	SPV.0090 SPECIAL 1011. CABLE AERIAL ALUMINUM 2 AWG TRIPLEX	72.000	LF		.		.
4790	SPV.0090 SPECIAL 1026. CABLE IN DUCT 5-6 AWG	1,408.000	LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4795	SPV.0090 SPECIAL 2021. 4-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	848.000 LF		.		.
4800	SPV.0090 SPECIAL 2022. 3-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	289.000 LF		.		.
4805	SPV.0090 SPECIAL 2023. 2-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	268.000 LF		.		.
4810	SPV.0090 SPECIAL 2024. CONDUIT SUBDUCT 1-INCH	575.000 LF		.		.
4815	SPV.0090 SPECIAL 3001. CABLE TYPE UF 2-14 AWG	6,020.000 LF		.		.
4820	SPV.0090 SPECIAL 3002. WOVEN PULL TAPE	1,126.000 LF		.		.
4825	SPV.0090 SPECIAL 3003. INSTALL CAMERA POWER CABLE	7,046.000 LF		.		.
4830	SPV.0090 SPECIAL 3004. INSTALL CAT-5E CABLE	7,630.000 LF		.		.
4835	SPV.0090 SPECIAL 4400. FENCE DECORATIVE BRIDGE	1,043.000 LF		.		.
4840	SPV.0090 SPECIAL 4410. FENCE DECORATIVE WING	217.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	CTS	BID AMOUNT DOLLARS	CTS
	SPV.0090 SPECIAL 4420.						
4845	FENCE DECORATIVE WALL	1,245.000	LF	.		.	
	SPV.0090 SPECIAL 4430.						
4850	PILING SLEEVES	2,709.000	LF	.		.	
	SPV.0090 SPECIAL 4440.						
4855	FOUNDATION DRILLING **P**	29,158.000	LF	.		.	
	SPV.0090 SPECIAL 4445.						
4860	PRE-BORING SPECIAL	312.000	LF	.		.	
	SPV.0090 SPECIAL 4450.						
4865	WALL SECANT PILE 47. 24-INCH **P**	446.000	LF	.		.	
	SPV.0090 SPECIAL 4455.						
4870	DRILLED FOUNDATION SHAFT 78.74-INCH **P**	289.200	LF	.		.	
	SPV.0090 SPECIAL 4470.						
4875	SHEET PILING INTERLOCK WATERPROOFING	2,490.000	LF	.		.	
	SPV.0090 SPECIAL 4480.						
4880	PRESTRESSED GIRDER TYPE I 54W-INCH SPECIAL	266.000	LF	.		.	
	SPV.0090 SPECIAL 5000.						
4885	STEEL CASING WITH DUCTILE IRON 12-INCH CARRIER	116.000	LF	.		.	
	SPV.0090 SPECIAL 5001.						
4890	STEEL CASING WITH DUCTILE IRON 16-INCH CARRIER	317.000	LF	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4895	SPV.0090 SPECIAL 5002. STEEL CASING WITH DUCTILE IRON 24-INCH CARRIER	421.000 LF		.		.
4900	SPV.0090 SPECIAL 5003. DUCTILE IRON HYDRANT BRANCH 6-INCH	339.000 LF		.		.
4905	SPV.0090 SPECIAL 5004. DUCTILE IRON WATER MAIN 6-INCH	989.000 LF		.		.
4910	SPV.0090 SPECIAL 5005. DUCTILE IRON WATER MAIN 8-INCH	979.000 LF		.		.
4915	SPV.0090 SPECIAL 5006. DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT	71.000 LF		.		.
4920	SPV.0090 SPECIAL 5007. DUCTILE IRON WATER MAIN 16-INCH	5,100.000 LF		.		.
4925	SPV.0090 SPECIAL 5008. DUCTILE IRON WATER MAIN RESTRAINED JOINT 16-INCH RESTRAINED JOINT	100.000 LF		.		.
4930	SPV.0090 SPECIAL 5009. DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT	42.000 LF		.		.
4935	SPV.0090 SPECIAL 5010. DUCTILE IRON (DI) AWWA C-151 CL. 55 WATER MAIN 24-INCH	134.000 LF		.		.
4940	SPV.0090 SPECIAL 5011. DUCTILE IRON (DI) AWWA C-151 CL. 55 WATER MAIN 16-INCH	54.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4945	SPV.0090 SPECIAL 5012. DUCTILE IRON (DI) AWWA C-151 CL.55 WM 24-IN WITH 42-IN STEEL CASING	340.000 LF		.		.
4950	SPV.0090 SPECIAL 5100. ABANDONING SANITARY SEWER 8-INCH	1,124.000 LF		.		.
4955	SPV.0090 SPECIAL 5102. ABANDONING SANITARY SEWER 12-INCH	1,005.000 LF		.		.
4960	SPV.0090 SPECIAL 5103. SANITARY AIR TESTING	3,085.000 LF		.		.
4965	SPV.0090 SPECIAL 5104. SANITARY SEWER LINING 8-INCH CURED-IN-PLACE	349.000 LF		.		.
4970	SPV.0090 SPECIAL 5105. STEEL CASING WITH 8-INCH SANITARY SEWER CARRIER	655.000 LF		.		.
4975	SPV.0090 SPECIAL 5106. STEEL CASING W/ 12-INCH SANITARY SEWER CARRIER	376.000 LF		.		.
4980	SPV.0090 SPECIAL 5107. STEEL CASING WITH 6-INCH SANITARY SEWER CARRIER	18.000 LF		.		.
4985	SPV.0090 SPECIAL 5108. SANITARY SEWER LATERAL CLASS "C" BEDDING	164.000 LF		.		.
4990	SPV.0090 SPECIAL 5109. SANITARY SEWER 8-INCH SDR 35 CLASS "C" BEDDING	1,862.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4995	SPV.0090 SPECIAL 5110. SANITARY SEWER 10-INCH SDR 35 CLASS "C" BEDDING	20.000 LF		.		.
5000	SPV.0090 SPECIAL 5111. SANITARY SEWER 12-INCH SDR 35 CLASS "C" BEDDING	917.000 LF		.		.
5005	SPV.0090 SPECIAL 5112. SANITARY SEWER 8-INCH SDR 26 CLASS "C" BEDDING	555.000 LF		.		.
5010	SPV.0090 SPECIAL 5113. SANITARY SEWER 12-INCH SDR 26 CLASS "C" BEDDING	33.000 LF		.		.
5015	SPV.0090 SPECIAL 5114. SANITARY SEWER 12-INCH RCP CLASS V WITH CONCRETE ENCASEMENT	16.000 LF		.		.
5020	SPV.0090 SPECIAL 5115. REMOVING SANITARY SEWER PIPE	2,077.000 LF		.		.
5025	SPV.0090 SPECIAL 8002. STORM SEWER PIPE REINFORCED CONC HORIZ ELLIP CLS HE-III 77X121-IN	978.000 LF		.		.
5030	SPV.0090 SPECIAL 8003. STORM SEWER PIPE REINFORCED CONC HORIZ ELLIP CLS HE-IV 77X121-IN	489.000 LF		.		.
5035	SPV.0090 SPECIAL 8004. STORM SEWER PIPE REINFORCED CONC HORIZ ELLIP CLASS HE-IV 38X60-IN	363.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5040	SPV.0090 SPECIAL 8025. PIPE UNDERDRAIN EXPLORATION	400.000 LF		.		.
5045	SPV.0090 SPECIAL 8026. STORM SEWER LATERAL EXPLORATION	400.000 LF		.		.
5050	SPV.0090 SPECIAL 8030. DRAIN SLOTTED VANE LONGITUDINAL	2,577.000 LF		.		.
5055	SPV.0090 SPECIAL 8096. TUNNEL EXCAVATION **P**	1,474.000 LF		.		.
5060	SPV.0105 SPECIAL 0001. SURVEY PROJECT 1060-33-80	LUMP	LUMP			.
5065	SPV.0105 SPECIAL 0002. PAVEMENT CLEANUP PROJECT 1060-33-80	LUMP	LUMP			.
5070	SPV.0105 SPECIAL 0003. CONCRETE PAVEMENT JOINT LAYOUT	LUMP	LUMP			.
5075	SPV.0105 SPECIAL 0010. REMOVING GEODETIC SURVEY MONUMENT 2X03	LUMP	LUMP			.
5080	SPV.0105 SPECIAL 0011. REMOVING GEODETIC SURVEY MONUMENT MILWAUKEE GPS AZ MARK	LUMP	LUMP			.
5085	SPV.0105 SPECIAL 0015. REMOVING PLAYGROUND	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5090	SPV.0105 SPECIAL 0016. REMOVING WEATHER STATION CHESTER STREET	LUMP	LUMP			.
5095	SPV.0105 SPECIAL 0017. REMOVING WEATHER STATION ZOOFARI CENTER	LUMP	LUMP			.
5100	SPV.0105 SPECIAL 0100. MOVING SIGN BRIDGE CANTILEVERED S-40-379	LUMP	LUMP			.
5105	SPV.0105 SPECIAL 0101. MOVING SIGN BRIDGE CANTILEVERED S-40-133	LUMP	LUMP			.
5110	SPV.0105 SPECIAL 0102. MOVING SIGN BRIDGE CANTILEVERED S-40-310	LUMP	LUMP			.
5115	SPV.0105 SPECIAL 0905. RAILING TUBULAR STEEL GALVANIZED PEDESTRIAN SOUTH WALL	LUMP	LUMP			.
5120	SPV.0105 SPECIAL 1006. MAINTENANCE OF LIGHTING SYSTEMS	LUMP	LUMP			.
5125	SPV.0105 SPECIAL 1007. LIGHTING SYSTEM INTEGRATOR	LUMP	LUMP			.
5130	SPV.0105 SPECIAL 2023. SAWING CONCRETE-ENCASED DUCT PACKAGE	LUMP	LUMP			.
5135	SPV.0105 SPECIAL 3001. REMOVE TRAFFIC SIGNALS USH 18 & 97TH STREET	LUMP	LUMP			.

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5140	SPV.0105 SPECIAL 3002. REMOVE TRAFFIC SIGNALS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5145	SPV.0105 SPECIAL 3003. TRANSPORTING SIGNAL AND LIGHTING MATERIALS IH 94 RAMPS & STH 181	LUMP	LUMP			.
5150	SPV.0105 SPECIAL 3004. TRANSPORTING SIGNAL AND LIGHTING MATERIALS USH 45 RAMPS & USH 18	LUMP	LUMP			.
5155	SPV.0105 SPECIAL 3005. TRANSPORTING SIGNAL AND LIGHTING MATERIALS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5160	SPV.0105 SPECIAL 3006. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB1	LUMP	LUMP			.
5165	SPV.0105 SPECIAL 3007. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 45 RAMPS & USH 18 CB1	LUMP	LUMP			.
5170	SPV.0105 SPECIAL 3008. TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS IH 94 RAMPS & STH 181	LUMP	LUMP			.
5175	SPV.0105 SPECIAL 3009. TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS USH 45 RAMPS & USH 18	LUMP	LUMP			.

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5180	SPV.0105 SPECIAL 3010. TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5185	SPV.0105 SPECIAL 3011. INSTALL STATE FURNISHED EVP DETECTOR HEADS IH 94 RAMPS & STH 181	LUMP	LUMP			.
5190	SPV.0105 SPECIAL 3012. INSTALL STATE FURNISHED EVP DETECTOR HEADS USH 45 RAMPS & USH 18	LUMP	LUMP			.
5195	SPV.0105 SPECIAL 3013. INSTALL STATE FURNISHED EVP DETECTOR HEADS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5200	SPV.0105 SPECIAL 3014. EXISTING TEMPORARY EVP SYSTEM IH 94 EB RAMPS & STH 181	LUMP	LUMP			.
5205	SPV.0105 SPECIAL 3015. EXISTING TEMPORARY EVP SYSTEM IH 94 WB RAMPS & STH 181	LUMP	LUMP			.
5210	SPV.0105 SPECIAL 3016. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 18 & N. 95TH STREET	LUMP	LUMP			.
5215	SPV.0105 SPECIAL 3017. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB2	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5220	SPV.0105 SPECIAL 3018. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 45 RAMPS & USH 18 CB2	LUMP	LUMP			.
5225	SPV.0105 SPECIAL 3019. TRANS AND INSTL STATE FURN RADAR DETECTION SYSTEM USH 45 RAMPS & USH 18	LUMP	LUMP			.
5230	SPV.0105 SPECIAL 3020. TEMPORARY TRAFFIC SIGNAL OPERATION WITH PERMANENT TRAFFIC SIGNAL EQUIP	LUMP	LUMP			.
5235	SPV.0105 SPECIAL 3051. INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET IH 94 RAMPS & STH 181	LUMP	LUMP			.
5240	SPV.0105 SPECIAL 3052. INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET USH 45 RAMPS & USH 18	LUMP	LUMP			.
5245	SPV.0105 SPECIAL 3053. INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET USH 18 & N. 95TH STREET	LUMP	LUMP			.
5250	SPV.0105 SPECIAL 4500. PAINTING POLYSILOXANE SYSTEM STRUCTURE B-40-855	LUMP	LUMP			.
5255	SPV.0105 SPECIAL 4520. TRIAL SECANT WALL PANEL 47.24-INCH	LUMP	LUMP			.

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5260	SPV.0105 SPECIAL 4540. UNDERDECK UTILITY STRUCTURE B-40-866	LUMP	LUMP			.
5265	SPV.0105 SPECIAL 4550. EXPANSION DEVICE MODULAR LRFD B-40-852	LUMP	LUMP			.
5270	SPV.0105 SPECIAL 4555. EXPANSION DEVICE MODULAR LRFD B-40-855	LUMP	LUMP			.
5275	SPV.0105 SPECIAL 5000. ADLER WATER BOOSTER STATION	LUMP	LUMP			.
5280	SPV.0105 SPECIAL 5001. REMOVING OLD BOOSTER STATION	LUMP	LUMP			.
5285	SPV.0105 SPECIAL 5002. BURLEIGH WATER BOOSTER STATION	LUMP	LUMP			.
5290	SPV.0105 SPECIAL 8098. CONTROL OF WATER	LUMP	LUMP			.
5295	SPV.0105 SPECIAL 8099. GEOTECHNICAL INSTRUMENTATION	LUMP	LUMP			.
5300	SPV.0110 SPECIAL 4600. TIMBER LAGGING **P**	282.400 MBM	.			.
5305	SPV.0135 SPECIAL 0001. VIBRATION MONITORING	300.000 MON	.			.
5310	SPV.0165 SPECIAL 0500. TRAFFIC CONTROL FIXED MESSAGE SIGNS LEFT IN PLACE	3,314.250 SF	.			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5315	SPV.0165 SPECIAL 0900. WALL MODULAR BLOCK MECHANICALLY STABILIZED EARTH LRFD	1,825.000 SF		.		.
5320	SPV.0165 SPECIAL 4700. LONGITUDINAL GROOVING BRIDGE DECK **P**	222,208.000 SF		.		.
5325	SPV.0165 SPECIAL 4710. WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP PILOT **P**	180,144.000 SF		.		.
5330	SPV.0165 SPECIAL 4720. WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD LFCF **P**	13,925.000 SF		.		.
5335	SPV.0165 SPECIAL 4740. TEMP WALL WIRE FACED MECHANICALLY STABILIZED EARTH LRFD/QMP PILOT	32,827.000 SF		.		.
5340	SPV.0165 SPECIAL 4750. GEOCOMPOSITE DRAINBOARD	94,084.000 SF		.		.
5345	SPV.0165 SPECIAL 4770. PRESTRESSED PRECAST CONCRETE WALL PANEL	2,765.000 SF		.		.
5350	SPV.0165 SPECIAL 8095. SHAFT EXCAVATION SUPPORT SYSTEM	28,865.000 SF		.		.
5355	SPV.0180 SPECIAL 0101. JOINT SEALING	40,938.000 SY		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5360	SPV.0180 SPECIAL 0102. CONCRETE PAVEMENT REPAIR SPECIAL	3,000.000 SY		.		.
5365	SPV.0180 SPECIAL 0103. HIGH FRICTION SURFACE TREATMENT CONCRETE	7,446.000 SY		.		.
5370	SPV.0180 SPECIAL 0104. HIGH FRICTION SURFACE TREATMENT ASPHALT	14,592.000 SY		.		.
5375	SPV.0180 SPECIAL 0105. CONCRETE PAVEMENT 12-INCH SPECIAL	227,685.000 SY		.		.
5380	SPV.0180 SPECIAL 0106. ASPHALTIC MATERIAL BINDER	3,407.000 SY		.		.
5385	SPV.0180 SPECIAL 0107. EPOXY RESIN BINDER	250.000 SY		.		.
5390	SPV.0180 SPECIAL 0200. TOPSOIL SPECIAL	383,676.000 SY		.		.
5395	SPV.0180 SPECIAL 0800. GEOGRID REINFORCEMENT	51,388.000 SY		.		.
5400	SPV.0180 SPECIAL 0801. SOIL DRYING	953,800.000 SY		.		.
5405	SPV.0180 SPECIAL 4800. SLOPE PAVING CRUSHED AGGREGATE SPECIAL **P**	1,037.000 SY		.		.
5410	SPV.0195 SPECIAL 0100. COLD PATCH	50.000 TON		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5415	SPV.0195 SPECIAL 0101. ASPHALTIC PAVEMENT REPAIR SPECIAL	2,395.000 TON		.		.
5420	SPV.0195 SPECIAL 0700. MANAGEMENT OF PETROLEUM CONTAMINATED SOIL AND SOLID WASTE	13,942.000 TON		.		.
5425	SPV.0195 SPECIAL 0801. SOIL DRYING AGENT	19,100.000 TON		.		.
	SECTION 0001 TOTAL					.

SECTION 0002 B-40-855 OPTION A
ALT GROUP AA1

5430	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.
5435	209.0100 BACKFILL GRANULAR	40.000 CY		.		.
5440	502.0100 CONCRETE MASONRY BRIDGES **P**	951.000 CY		.		.
5445	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	214,290.000 LB		.		.
5450	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	200,370.000 LB		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5455	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF		.		.
5460	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0001. B-40-855	1,295.000 SF		.		.
5465	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	5,706.000 DOL	1.00000		5706.00	
5470	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	7.000 EACH		.		.
5475	SPV.0060 SPECIAL 4171. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 98.43-IN	7.000 EACH		.		.
5480	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	28.000 HRS		.		.
5485	SPV.0090 SPECIAL 4460. DRILLED FOUNDATION SHAFT 98.43-INCH **P**	495.000 LF		.		.
5490	SPV.0105 SPECIAL 4510. TRIAL DRILLED FOUNDATION SHAFT 98.43-INCH	LUMP	LUMP			.
	SECTION 0002 TOTAL					.

SECTION 0003 B-40-855 OPTION B
ALT GROUP AA2

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5495	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.
5500	209.0100 BACKFILL GRANULAR	341.000 CY		.		.
5505	502.0100 CONCRETE MASONRY BRIDGES **P**	1,100.000 CY		.		.
5510	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	188,970.000 LB		.		.
5515	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	203,090.000 LB		.		.
5520	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF		.		.
5525	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0001. B-40-855	1,295.000 SF		.		.
5530	550.2168 PILING CIP CONCRETE 16 X 0.50-INCH	2,100.000 LF		.		.
5535	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	6,600.000 DOL	1.00000		6600.00	
5540	SPV.0060 SPECIAL 4110. PILE DYNAMIC ANALYZER (PDA) TESTING	2.000 EACH		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5545	SPV.0060 SPECIAL 4115. PILE DYNAMIC ANALYZER (PDA) RESTRIKES	2.000 EACH		.		.
5550	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	6.000 EACH		.		.
5555	SPV.0060 SPECIAL 4171. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 98.43-IN	6.000 EACH		.		.
5560	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	24.000 HRS		.		.
5565	SPV.0090 SPECIAL 4460. DRILLED FOUNDATION SHAFT 98.43-INCH **P**	400.000 LF		.		.
5570	SPV.0105 SPECIAL 4510. TRIAL DRILLED FOUNDATION SHAFT 98.43-INCH	LUMP	LUMP			.
	SECTION 0003 TOTAL					.
	TOTAL BID					.

PLEASE ATTACH SCHEDULE OF ITEMS HERE

Wisconsin Department of Transportation

Division of Transportation Systems Development
Bureau of Project Development
4802 Sheboygan Avenue, Rm 601
P O Box 7916
Madison, WI 53707-7916

Telephone: (608) 266-1631
Facsimile (FAX): (608) 266-8459

July 14, 2014

NOTICE TO ALL CONTRACTORS:

Federal Wage Rate Addendum #1

Letting of August 26, 2014

Attached are copies of the revised U.S. Department of Labor Wage Rates that are effective for many proposals in the August 26, 2014 letting. The first page of the attachment are the first page of the county highway wage sheets (Page 1 of 3) and correspond to the affected proposal's county. The last two pages of the attachment are pages 2 and 3 of the highway wage sheets, which are the same for all counties.

The following proposals and counties are affected in the August 26, 2014 letting:

01 Milwaukee	

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractors.

Sincerely,

Mike Coleman
Proposal Development Specialist
Proposal Management Section

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: July 4, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence and Bridge Builder; Landscaper, Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, Utility Man); Batch Truck Dumper; or Cement Handler; Bituminous Worker; (Dumper, Ironer, Smoother, Tamper); Concrete Handler	$26.06	18.15
Group 2: Air Tool Operator; Joint Sawer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer	26.21	18.15
Group 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off man	26.41	18.15
Group 4: Line and Grade Specialist	26.56	18.15
Group 5: Blaster and Powderman	26.71	18.15
Group 6: Flagperson traffic control person	22.55	18.15

CLASSES OF LABORER AND MECHANICS

Bricklayer	35.37	18.47
Carpenter	30.52	14.41
Piledriverman	27.25	19.46
Ironworker	30.52	23.47
Cement Mason/Concrete Finisher	30.69	17.53
Electrician		See Page 3
Line Construction		
Lineman	39.50	32% + 5.00
Heavy Equipment Operator	37.53	32% + 5.00
Equipment Operator	31.60	32% + 5.00
Heavy Groundman Driver	26.78	14.11
Light Groundman Driver	24.86	13.45
Groundsman	21.73	32% + 5.00
Millwrights	26.32	13.98
Painter, Brush	29.52	20.04
Painter, Spray and Sandblaster	30.27	20.04
Painter, Bridge	29.87	20.04
Well Drilling:		
Well Driller	16.52	3.70

	Basic Hourly Rates	Fringe Benefits
Truck Drivers:		
1 & 2 Axles	25.18	18.31
Three or More Axles; Euclids, Dumptor & Articulated, Truck Mechanic	25.38	18.31

Notes: Welders receive rate prescribed for craft performing operation to which welding is incidental. Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR, 5.5(a)(1)(ii)). Includes Modification #0, dated January 3, 2014; Modification #1, dated February 7, 2014; Modification #2, dated March 14, 2014; Modification #3, dated May 2, 2014; Modification #4, dated June 27, 2014; Modification #5, dated July 4, 2014.

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: July 4, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

POWER EQUIPMENT OPERATORS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of over 100 tons or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 176 feet or longer	$36.72	$20.10
Group 2: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of 100 tons or less or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 175 feet or less, and backhoes (excavators) having a manufacturer's rated capacity of 3 cu. yds. and over, caisson rigs, pile driver, dredge operator, dredge engineer.	$36.22	$20.10
Group 3: Mechanic or welder - heavy duty equipment, cranes with a lifting capacity of 25 tons or less, concrete breaker (manual or remote); vibrator/sonic concrete breaker; concrete laser screed; concrete slipform paver; concrete batch plant operator; concrete pavement spreader - heavy duty (rubber tired); concrete spreader and distributor, automatic subgrader (concrete); concrete grinder and planing machine; concrete slipform curb and gutter machine; slipform concrete placer; tube finisher; hydro blaster (10,000 psi and over); bridge paver; concrete conveyor system; concrete pump; stabilizing mixer (self propelled); shoulder widener; asphalt plant engineer; bituminous paver; bump cutter and grooving machine; milling machine; screed (bituminous paver); asphalt heater, planer and scarifier; backhoes (excavators) having a manufacturers rated capacity of under 3 cu. yds.; grader or motor patrol; tractor (scraper, dozer, pusher, loader); scraper - rubber tired (single or twin engine); endloader hydraulic backhoe (tractor-type); trenching machine; skid rigs; tractor, side boom (heavy); drilling or boring machine (mechanical heavy); roller (over 5 tons); percussion or rotary drilling machine; air track; blaster; loading machine (conveyor); tugger; boatmen; winches and A-frames; post driver; material hoist operator.	$35.72	$20.10
Group 4: Greaser, roller steel (5 tons or less); roller (pneumatic tired) - self-propelled; tractor (mounted or towed compactors and light equipment); shouldering machine; self-propelled chip spreader; concrete spreader; finishing machine; mechanical float; curing machine; power subgrader; joint saw (multiple blade) belting machine; burlap machine; texturing machine; tractor, endloader (rubber tired) - light; jeep digger; fork lift; mulcher; launch operator; fireman; environmental burner.	$35.46	$20.10
Group 5: Air compressor; power pack; vibratory hammer and extractor; heavy equipment, leadman; tank car heaters; stump chipper; curb machine operator; concrete pro-portioning plants generators; mudjack operator; rock breaker; crusher or screening plant; screed (milling machine); automatic belt conveyor and surge bin; pug mill operator; oiler; pump (over 3 inches); drilling machine helper.	$35.17	$20.10
Group 6: Off – road material hauler with or without ejector	$29.27	$20.10

Premium Pay:
EPA Level "A" protection - $3.00 per hour
EPA Level "B" protection - $2.00 per hour
EPA Level "C" protection - $1.00 per hours

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: July 4, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Rates	Benefits
Electricians		
Area 1	$28.40	16.676
Area 2:		
Electricians	29.13	17.92
Area 3:		
Electrical contracts under $130,000	26.24	16.85
Electrical contracts over $130,000	29.41	16.97
Area 4:	28.50	28.75% + 9.27
Area 5	28.96	24.85% + 9.70
Area 6	35.25	19.30
Area 8		
Electricians	30.60	24.95% + 10.33
Area 9:		
Electricians	32.94	18.71
Area 10	29.64	20.54
Area 11	32.54	24.07
Area 12	32.87	19.23
Area 13	32.82	22.51
Teledata System Installer		
Area 14		
Installer/Technician	21.89	11.83
Sound & Communications		
Area 15		
Installer	16.47	14.84
Technician	24.75	16.04

Area 1 - CALUMET (except township of New Holstein), GREEN LAKE (N. part, including Townships of Berlin, St. Marie and Seneca), MARQUETTE (N. part, including Townships of Crystal Lake, Neshkoro, Newton & Springfield), OUTAGAMIE, WAUPACA, WAUSHARA and WINNEBAGO COUNTIES.

Area 2 - ASHLAND, BARRON, BAYFIELD, BUFFALO, BURNETT, CHIPPEWA, CLARK (except Mayville, Colby, Unity, Sherman, Fremont, Lynn and Sherwood), CRAWFORD, DUNN, EAU CLAIRE, GRANT, IRON, JACKSON, LA CROSSE, MONROE, PEPIN, PIERCE, POLK, PRICE, RICHLAND, RUSK, ST. CROIX, SAWYER, TAYLOR, TREMPEALEAU, VERNON and WASHBURN COUNTIES

Area 3 - FLORENCE (townships of Aurora, Commonwealth, Fern, Florence and Homestead), MARINETTE (Niagara township)

Area 4 - BROWN, DOOR, KEWAUNEE, MANITOWOC (except Schleswig), MARINETTE (Wausauke and area south thereof), OCONTO, MENOMINEE (East of a line 6 miles West of the West boundary of Oconto County), SHAWANO (except area North of Townships of Aniwa and Hutchins) COUNTIES.

Area 5 - ADAMS, CLARK (Colby, Freemont, Lynn, Mayville, Sherman, Sherwood, Unity), FOREST, JUNEAU, LANGLADE, LINCOLN, MARATHON, MARINETTE (Area North of the town of Wausaukee), MENOMINEE (Area West of a line 6 miles West of the West boundary of Oconto County), ONEIDA, PORTAGE, SHAWANO (Area North of the townships of Aniwa and Hutchins), VILAS AND WOOD COUNTIES

Area 6 - KENOSHA COUNTY

Area 8 - DODGE, (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE, RACINE (Burlington township), ROCK and WALWORTH COUNTIES

Area 9 - COLUMBIA, DANE, DODGE, (area west of Hwy. 26, except Chester & Emmet Townships), GREEN LAKE (except townships of Berlin, Seneca and St. Marie), IOWA, MARQUETTE (except townships of Neshkoka, Crystal Lake, Newton and Springfield), and SAUK COUNTIES

Area 10 - CALUMET (Township of New Holstein), DODGE (East of Hwy. 26 including Chester Township), FOND DU LAC, MANITOWOC (Schleswig), and SHEBOYGAN COUNTIES

Area 11 - DOUGLAS COUNTY

Area 12 - RACINE (except Burlington township) COUNTY

Area 13 - MILWAUKEE, OZAUKEE, WASHINGTON and WAUKESHA COUNTIES

Area 14 - Statewide.

Area 15 - DODGE (East of Hwy 26 including Chester Twp, excluding Emmet Twp), FOND DU LAC (Except Waupun), MILWAUKEE, OZAUKEE, MANITOWOC (Schleswig), WASHINGTON, AND WAUKESHA COUNTIES.

Wisconsin Department of Transportation

Division of Transportation Systems Development
Bureau of Project Development
4802 Sheboygan Avenue, Rm 601
P O Box 7916
Madison, WI 53707-7916

Telephone: (608) 266-1631
Facsimile (FAX): (608) 266-8459

July 28, 2014

NOTICE TO ALL CONTRACTORS:

Federal Wage Rate Addendum #2

Letting of August 26, 2014

Attached are copies of the revised U.S. Department of Labor Wage Rates that are effective for many proposals in the August 26, 2014 letting. The first page of the attachment are the first page of the county highway wage sheets (Page 1 of 3) and correspond to the affected proposal's county. The last two pages of the attachment are pages 2 and 3 of the highway wage sheets, which are the same for all counties.

The following proposals and counties are affected in the August 26, 2014 letting:

01 Milwaukee	

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Sincerely,

Mike Coleman
Proposal Development Specialist
Proposal Management Section

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: July 25, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence and Bridge Builder; Landscaper, Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, Utility Man); Batch Truck Dumper; or Cement Handler; Bituminous Worker; (Dumper, Ironer, Smoother, Tamper); Concrete Handler	$26.06	18.15
Group 2: Air Tool Operator; Joint Sawer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer	26.21	18.15
Group 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off man	26.41	18.15
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Group 5: Blaster and Powderman	26.71	18.15
Group 6: Flagperson traffic control person	22.55	18.15

CLASSES OF LABORER AND MECHANICS

Bricklayer	35.37	18.47
Carpenter	30.52	14.41
Piledriverman	27.25	19.46
Ironworker	30.52	23.47
Cement Mason/Concrete Finisher	30.69	17.53
Electrician		See Page 3
Line Construction		
Lineman	39.50	32% + 5.00
Heavy Equipment Operator	37.53	32% + 5.00
Equipment Operator	31.60	32% + 5.00
Heavy Groundman Driver	26.78	14.11
Light Groundman Driver	24.86	13.45
Groundsman	21.73	32% + 5.00
Millwrights	26.32	13.98
Painter, Brush	29.52	20.04
Painter, Spray and Sandblaster	30.27	20.04
Painter, Bridge	29.87	20.04
Well Drilling:		
Well Driller	16.52	3.70

	Basic Hourly Rates	Fringe Benefits
Truck Drivers:		
1 & 2 Axles	25.18	18.31
Three or More Axles; Euclids, Dumptor & Articulated, Truck Mechanic	25.38	18.31

Notes: Welders receive rate prescribed for craft performing operation to which welding is incidental. Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR, 5.5(a)(1)(ii)). Includes Modification #0, dated January 3, 2014; Modification #1, dated February 7, 2014; Modification #2, dated March 14, 2014; Modification #3, dated May 2, 2014; Modification #4, dated June 27, 2014; Modification #5, dated July 4, 2014; Modification #6, dated July 25, 2014.

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: July 25, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

POWER EQUIPMENT OPERATORS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of over 100 tons or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 176 feet or longer	$37.72	$20.93
Group 2: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of 100 tons or less or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 175 feet or less, and backhoes (excavators) having a manufacturer's rated capacity of 3 cu. yds. and over, caisson rigs, pile driver, dredge operator, dredge engineer.	$37.22	$20.93
Group 3: Mechanic or welder - heavy duty equipment, cranes with a lifting capacity of 25 tons or less, concrete breaker (manual or remote); vibrator/sonic concrete breaker; concrete laser screed; concrete slipform paver; concrete batch plant operator; concrete pavement spreader - heavy duty (rubber tired); concrete spreader and distributor, automatic subgrader (concrete); concrete grinder and planing machine; concrete slipform curb and gutter machine; slipform concrete placer; tube finisher; hydro blaster (10,000 psi and over); bridge paver; concrete conveyor system; concrete pump; stabilizing mixer (self propelled); shoulder widener; asphalt plant engineer; bituminous paver; bump cutter and grooving machine; milling machine; screed (bituminous paver); asphalt heater, planer and scarifier; backhoes (excavators) having a manufacturers rated capacity of under 3 cu. yds.; grader or motor patrol; tractor (scraper, dozer, pusher, loader); scraper - rubber tired (single or twin engine); endloader hydraulic backhoe (tractor-type); trenching machine; skid rigs; tractor, side boom (heavy); drilling or boring machine (mechanical heavy); roller (over 5 tons); percussion or rotary drilling machine; air track; blaster; loading machine (conveyor); tugger; boatmen; winches and A-frames; post driver; material hoist operator.	$36.72	$20.93
Group 4: Greaser, roller steel (5 tons or less); roller (pneumatic tired) - self-propelled; tractor (mounted or towed compactors and light equipment); shouldering machine; self-propelled chip spreader; concrete spreader; finishing machine; mechanical float; curing machine; power subgrader; joint saw (multiple blade) belting machine; burlap machine; texturing machine; tractor, endloader (rubber tired) - light; jeep digger; fork lift; mulcher; launch operator; fireman; environmental burner.	$36.46	$20.93
Group 5: Air compressor; power pack; vibratory hammer and extractor; heavy equipment, leadman; tank car heaters; stump chipper; curb machine operator; concrete pro-portioning plants generators; mudjack operator; rock breaker; crusher or screening plant; screed (milling machine); automatic belt conveyor and surge bin; pug mill operator; oiler; pump (over 3 inches); drilling machine helper.	$36.17	$20.93
Group 6: Off – road material hauler with or without ejector	$30.27	$20.93

Premium Pay:
EPA Level "A" protection - $3.00 per hour
EPA Level "B" protection - $2.00 per hour
EPA Level "C" protection - $1.00 per hours

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: July 25, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Rates	Benefits
Electricians		
Area 1	$28.40	16.676
Area 2:		
Electricians	29.13	17.92
Area 3:		
Electrical contracts under $130,000	26.24	16.85
Electrical contracts over $130,000	29.41	16.97
Area 4:	28.50	28.75% + 9.27
Area 5	28.96	24.85% + 9.70
Area 6	35.25	19.30
Area 8		
Electricians	30.60	24.95% + 10.33
Area 9:		
Electricians	32.94	18.71
Area 10	29.64	20.54
Area 11	32.54	24.07
Area 12	32.87	19.23
Area 13	32.82	22.51
Teledata System Installer		
Area 14		
Installer/Technician	21.89	11.83
Sound & Communications		
Area 15		
Installer	16.47	14.84
Technician	24.75	16.04

Area 1 - CALUMET (except township of New Holstein), GREEN LAKE (N. part, including Townships of Berlin, St. Marie and Seneca), MARQUETTE (N. part, including Townships of Crystal Lake, Neshkoro, Newton & Springfield), OUTAGAMIE, WAUPACA, WAUSHARA and WINNEBAGO COUNTIES.

Area 2 - ASHLAND, BARRON, BAYFIELD, BUFFALO, BURNETT, CHIPPEWA, CLARK (except Mayville, Colby, Unity, Sherman, Fremont, Lynn and Sherwood), CRAWFORD, DUNN, EAU CLAIRE, GRANT, IRON, JACKSON, LA CROSSE, MONROE, PEPIN, PIERCE, POLK, PRICE, RICHLAND, RUSK, ST. CROIX, SAWYER, TAYLOR, TREMPEALEAU, VERNON and WASHBURN COUNTIES

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Area 5 - ADAMS, CLARK (Colby, Freemont, Lynn, Mayville, Sherman, Sherwood, Unity), FOREST, JUNEAU, LANGLADE, LINCOLN, MARATHON, MARINETTE (Area North of the town of Wausaukee), MENOMINEE (Area West of a line 6 miles West of the West boundary of Oconto County), ONEIDA, PORTAGE, SHAWANO (Area North of the townships of Aniwa and Hutchins), VILAS AND WOOD COUNTIES

Area 6 - KENOSHA COUNTY

Area 8 - DODGE, (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE, RACINE (Burlington township), ROCK and WALWORTH COUNTIES

Area 9 - COLUMBIA, DANE, DODGE, (area west of Hwy. 26, except Chester & Emmet Townships), GREEN LAKE (except townships of Berlin, Seneca and St. Marie), IOWA, MARQUETTE (except townships of Neshkoka, Crystal Lake, Newton and Springfield), and SAUK COUNTIES

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Area 11 - DOUGLAS COUNTY

Area 12 - RACINE (except Burlington township) COUNTY

Area 13 - MILWAUKEE, OZAUKEE, WASHINGTON and WAUKESHA COUNTIES

Area 14 - Statewide.

Area 15 - DODGE (East of Hwy 26 including Chester Twp, excluding Emmet Twp), FOND DU LAC (Except Waupun), MILWAUKEE, OZAUKEE, MANITOWOC (Schleswig), WASHINGTON, AND WAUKESHA COUNTIES.

Wisconsin Department of Transportation

Division of Transportation Systems Development
Bureau of Project Development
4802 Sheboygan Avenue, Rm 601
P O Box 7916
Madison, WI 53707-7916

Telephone: (608) 266-1631
Facsimile (FAX): (608) 266-8459

August 5, 2014

NOTICE TO ALL CONTRACTORS:

Federal Wage Rate Addendum #3

Letting of August 26, 2014

Attached are copies of the revised U.S. Department of Labor Wage Rates that are effective for many proposals in the August 26, 2014 letting. The first page of the attachment are the first page of the county highway wage sheets (Page 1 of 3) and correspond to the affected proposal's county. The last two pages of the attachment are pages 2 and 3 of the highway wage sheets, which are the same for all counties.

The following proposals and counties are affected in the August 26, 2014 letting:

01 Milwaukee	

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractors.

Sincerely,

Mike Coleman
Proposal Development Specialist
Proposal Management Section

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: August 1, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence and Bridge Builder; Landscaper, Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, Utility Man); Batch Truck Dumper; or Cement Handler; Bituminous Worker; (Dumper, Ironer, Smoother, Tamper); Concrete Handler	$27.06	18.73
Group 2: Air Tool Operator; Joint Sawer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer	27.21	18.73
Group 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off man	27.41	18.73
Group 4: Line and Grade Specialist	27.56	18.73
Group 5: Blaster and Powderman	27.71	18.73
Group 6: Flagperson traffic control person	23.55	18.73

CLASSES OF LABORER AND MECHANICS

Bricklayer	35.37	18.47
Carpenter	30.52	14.41
Piledriverman	27.25	19.46
Ironworker	30.52	23.47
Cement Mason/Concrete Finisher	30.69	17.53
Electrician		See Page 3
Line Construction		
Lineman	39.50	32% + 5.00
Heavy Equipment Operator	37.53	32% + 5.00
Equipment Operator	31.60	32% + 5.00
Heavy Groundman Driver	26.78	14.11
Light Groundman Driver	24.86	13.45
Groundsman	21.73	32% + 5.00
Millwrights	26.32	13.98
Painter, Brush	29.52	20.04
Painter, Spray and Sandblaster	30.27	20.04
Painter, Bridge	29.87	20.04
Well Drilling:		
Well Driller	16.52	3.70

	Basic Hourly Rates	Fringe Benefits
Truck Drivers:		
1 & 2 Axles	25.18	18.31
Three or More Axles; Euclids, Dumptor & Articulated, Truck Mechanic	25.38	18.31

Notes: Welders receive rate prescribed for craft performing operation to which welding is incidental. Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR, 5.5(a)(1)(ii)). Includes Modification #0, dated January 3, 2014; Modification #1, dated February 7, 2014; Modification #2, dated March 14, 2014; Modification #3, dated May 2, 2014; Modification #4, dated June 27, 2014; Modification #5, dated July 4, 2014; Modification #6, dated July 25, 2014; Modification #7, dated August 1, 2014.

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: August 1, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

POWER EQUIPMENT OPERATORS CLASSIFICATION:	Basic Hourly Rates	Fringe Benefits
Group 1: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of over 100 tons or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 176 feet or longer	$37.72	$20.93
Group 2: Cranes, tower cranes and derricks, with or without attachments, with a lifting capacity of 100 tons or less or cranes, tower cranes and derricks with boom, leads and/or jib lengths measuring 175 feet or less, and backhoes (excavators) having a manufacturer's rated capacity of 3 cu. yds. and over, caisson rigs, pile driver, dredge operator, dredge engineer.	$37.22	$20.93
Group 3: Mechanic or welder - heavy duty equipment, cranes with a lifting capacity of 25 tons or less, concrete breaker (manual or remote); vibrator/sonic concrete breaker; concrete laser screed; concrete slipform paver; concrete batch plant operator; concrete pavement spreader - heavy duty (rubber tired); concrete spreader and distributor, automatic subgrader (concrete); concrete grinder and planing machine; concrete slipform curb and gutter machine; slipform concrete placer; tube finisher; hydro blaster (10,000 psi and over); bridge paver; concrete conveyor system; concrete pump; stabilizing mixer (self propelled); shoulder widener; asphalt plant engineer; bituminous paver; bump cutter and grooving machine; milling machine; screed (bituminous paver); asphalt heater, planer and scarifier; backhoes (excavators) having a manufacturers rated capacity of under 3 cu. yds.; grader or motor patrol; tractor (scraper, dozer, pusher, loader); scraper - rubber tired (single or twin engine); endloader hydraulic backhoe (tractor-type); trenching machine; skid rigs; tractor, side boom (heavy); drilling or boring machine (mechanical heavy); roller (over 5 tons); percussion or rotary drilling machine; air track; blaster; loading machine (conveyor); tugger; boatmen; winches and A-frames; post driver; material hoist operator.	$36.72	$20.93
Group 4: Greaser, roller steel (5 tons or less); roller (pneumatic tired) - self-propelled; tractor (mounted or towed compactors and light equipment); shouldering machine; self-propelled chip spreader; concrete spreader; finishing machine; mechanical float; curing machine; power subgrader; joint saw (multiple blade) belting machine; burlap machine; texturing machine; tractor, endloader (rubber tired) - light; jeep digger; fork lift; mulcher; launch operator; fireman; environmental burner.	$36.46	$20.93
Group 5: Air compressor; power pack; vibratory hammer and extractor; heavy equipment, leadman; tank car heaters; stump chipper; curb machine operator; concrete pro-portioning plants generators; mudjack operator; rock breaker; crusher or screening plant; screed (milling machine); automatic belt conveyor and surge bin; pug mill operator; oiler; pump (over 3 inches); drilling machine helper.	$36.17	$20.93
Group 6: Off – road material hauler with or without ejector	$30.27	$20.93

Premium Pay:
EPA Level "A" protection - $3.00 per hour
EPA Level "B" protection - $2.00 per hour
EPA Level "C" protection - $1.00 per hours

SUPERSEDES DECISION WI20120010
U. S. DEPARTMENT OF LABOR
(DAVIS-BACON ACT, MINIMUM WAGE RATES)

STATE: Wisconsin
GENERAL DECISION NUMBER: WI140010
DATE: August 1, 2014
DESCRIPTION OF WORK: Highways and Airport Runway and Taxiway Construction

LABORERS CLASSIFICATION:	Rates	Benefits
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Electricians	29.13	17.92
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Wisconsin Department of Transportation

July 23, 2014

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4802 Sheboygan Avenue, Rm 601
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Telephone: (608) 266-1631
Facsimile (FAX): (608) 266-8459

NOTICE TO ALL CONTRACTORS:

Proposal #01: 1060-33-80, WISC 2014 314
Zoo IC – Zoo Interchange Phase 1
Lincoln – Bluemound, 121st to 70th
USH 45
Milwaukee

Letting of August 26, 2014

This is Addendum No. 1, which provides for the following:

Special Provisions

Revised Special Provisions	
Article No.	Description
4	Prosecution and Progress
6	Traffic
13	Hauling Restrictions
79	Temporary Shoring B-40-855, Item 511.1200.0001; Temporary Shoring R-40-524, Item 511.1200.0002; Temporary Shoring R-40-551, Item 511.1200.0003; Temporary Shoring R-40-552, Item 511.1200.0004; Temporary Shoring 24FCB+78 to 32FCB+19, Item 511.1300.0001; Temporary Shoring 41FCB+67 to 45FCB+07, Item 511.1300.0002; Temporary Shoring 344NS+62 to 346NS+00, Item 511.1300.0003; Temporary Shoring 595SW+59 to 595SW+78, Item 511.1300.0004; Temporary Shoring 317NS+85 to 318NS+20, Item 511.1300.0005; Temporary Shoring 321NS+38 to 323NS+97, Item 511.1300.0006; Temporary Shoring 326NS+28 to 327NS+14, Item 511.1300.0007; Temporary Shoring 269EW+98 to 279EW+44, Item 511.1300.0008; Temporary Shoring 273EW+97 to 279EW+25, Item 511.1300.0009; Temporary Shoring 313NS+33 to 318NS+00, Item 511.1300.0010; Temporary Shoring 232EW+65 to 233EW+15, Item 511.1300.0011; Temporary Shoring 233EW+76 to 234EW+26, Item 511.1300.0012; Temporary Shoring 152EW+14 to 152EW+71, Item 511.1300.0013; Temporary Shoring 802BB+15 to 802BB+36, Item 511.1300.0014; Temporary Shoring 802BB+16 to 802BB+58, Item 511.1300.0015; Temporary Shoring 802BB+58 to 803BB+00, Item 511.1300.0016; Temporary Shoring 802BB+80 to 803BB+01, Item 511.1300.0017; Temporary Shoring Left in Place B-40-855, Item 511.2200.0001; Temporary Shoring Left in Place B-40-789, Item 511.2200.0002; Temporary Shoring Left in Place R-40-525, Item 511.2200.0003; Temporary Shoring Left in Place R-40-536, Item 511.2200.0004.

123	Temporary Traffic Signals for Intersections
159	Salvaging Crash Cushion, Item SPV.0060.0100.
303	Maintain Concrete Barrier Temporary Precast, Item SPV.0090.0125.

Added Special Provisions	
Article No.	Description
410	Temporary Traffic Signals for Intersections, IH 94 WB Ramps & STH 181, Item 661.0200.3003.
411	Traffic Control Full Freeway Closure, Item SPV.0060.0408.

Deleted Special Provisions	
Article No.	Description
373	Temporary Traffic Signal Operation with Permanent Traffic Signal Equipment, Item SPV.0105.3020.

Schedule of Items

Revised Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
204.9090.S.0002	Removing Retaining Wall	LF	959	802	802
643.0910	Traffic Control Covering Signs Type 1	EACH	89	92	92
ASP.1TOA	On-The-Job Training Apprentice at $5.00/Hour	HRS	800	22500	22500
ASP.1TOG	On-The-Job Training Graduate at $5.00/Hour	HRS	3000	22500	22500
SPV.0060.0100	Salvaging Crash Cushion	EACH	6	9	9
SPV.0060.0400	Traffic Control Close-Open Freeway Entrance Ramp	EACH	100	850	850
SPV.0060.0401	Traffic Control Close-Open Freeway To Freeway System Ramp	EACH	50	590	590
SPV.0060.0402	Traffic Control Interim Freeway Lane Closure	EACH	300	2265	2265
661.0300	Generators	DAY	4	6	6

Added Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
511.1300.0018	Temporary Shoring 7FCV+83 TO 9FCV+53	SF	0	1405	1405
511.1300.0019	Temporary Shoring 9FCV+21 TO 10FCV+76	SF	0	1210	1210
SPV.0060.0408	Traffic Control Full Freeway Closure	EACH	0	280	280
661.0200.3003	Temporary Traffic Signals For Intersections IH 94 WB Ramps & STH 181	LS	0	1	1

Deleted Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
SPV.0105.3020	Temporary Traffic Signal Operation With Permanent Traffic Signal Equipment	LS	1	0	0

Plan Sheets

Revised Plan Sheets	
Plan Sheet	Plan Sheet Title (brief description of changes to sheet)
189	Construction Details – B-40-93 Partial Removal, added note #5.
300-301	Removal Plans – Added salvaging crash cushion notes.
1013	Temporary Traffic Signal Project Overview – Revised notes in legend.
1025-1035	Temporary Traffic Signal Plan and Temporary Sequence of Operations – Revised to show a temporary traffic signal.
1274	Stage 3A Construction – Revised to show temporary shoring for box culvert removal.
1313	Stage 4A Construction - Revised to show temporary shoring for box culvert removal. Revised to include a left turn off the WB exit ramp south to 84th Street. Revised signage.
1315-1316	Stage 4A Construction - Revised signage to allow for a left turn off the WB exit ramp south to 84th Street.
1321	Stage 4A Construction - Revised staging to allow for a left turn off the WB exit ramp south to 84th Street.
1323-1324	Stage 4B Construction - Revised staging to allow for a left turn off the WB exit ramp south to 84th Street.
1373	Detour Ramp ES (1 of 2) Stages 2-5 – Revised note for detour to 70th Street.
1504	Miscellaneous Quantities – Revised Removing Retaining Wall table
1515	Miscellaneous Quantities – Revised Salvaging Crash Cushion table
1583	Miscellaneous Quantities – Revised Temporary Shoring table
1711-1712	Miscellaneous Quantities – Revised Traffic Control Items table
1731	Miscellaneous Quantities – Revised Traffic Control Closure Items table
1830	Miscellaneous Quantities – Added Temporary Signal table for IH 94 WB Ramps & STH 181
1831	Miscellaneous Quantities – Removed Temporary Traffic Signal Operation With Permanent Traffic Signal Equipment table
3382	Structure N-40-73 – Revised detail to include a non-laminated neoprene bearing pad.

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

Sincerely,

Mike Coleman

Proposal Development Specialist
Proposal Management Section

ADDENDUM NO. 1

1060-33-80

July 23, 2014

Special Provisions

4. Prosecution and Progress.

Add the following paragraph after the third paragraph:

Furnish a written request for a conditional notice to proceed to the Project engineer for approval to begin work prior to December 1, 2014. The request for a conditional notice to proceed shall be specific and include description of work, work zones, schedule, haul routes and traffic impacts. The conditional notice to proceed will not affect the completion date. All construction equipment, traffic impacts and activities utilized or mobilized prior to December 1, 2014 shall not disrupt the ongoing construction contracts listed in the Other Contracts section of the Specifications.

Remove the following under **Schedule of Operations**:

For the purpose of schedule;

Replace **Section 2 (East Leg)** under **Schedule of Operations** with the following:

Section 2 (East Leg) is defined as the removal of B-40-90; the construction of B-40-864, R-40-551 phase 2, R-40-552 phase 2, R-40-554, and R-40-619; I-94 EB between Station EW211+64 and Station EW285+25 as shown in the Stage 4A and Stage 5 plans; 84th Street between Station F35+24.89 and Station F42+92 as shown in the Stage 4A & 4B plans; Adler Street, Kearney Street, the EB entrance ramp from 84th Street, the EB exit ramps to 84th and 70th Streets as shown in Stage 4A plans.

Add the following paragraph after the first paragraph under **Contractor Coordination**:

Contract ID 1060-33-72, Zoo IC - Watertown Plank Road Interchange reconstruction from Wisconsin Avenue to Underwood Parkway. The WisDOT contact is Jeff Bohen at (414) 750-2928; jeff.bohen@dot.wi.gov. This contract will permanently close the US45 southbound exit ramp to Wisconsin Avenue. Coordinate with this project to determine the exact date and time for the closure. Anticipated closure date for the ramp is December 1, 2014.

Replace **Rolling Closure** with the following:

Rolling Closure
Short term freeway mainline rolling closures may be allowed for a maximum of 15 minutes for the removal and erection of sign structures, equipment moves across the road, or other required work as determined by the engineer. The department will allow short term rolling closures only between 2:00 AM and 4:00 AM, and they may only be performed by freeway law enforcement.

Obtain approval from the engineer before coordinating these closures with freeway law enforcement. Coordinate 14 calendar days in advance of closure. Present the scheduled time for the short term rolling closure at the weekly traffic meeting a minimum of one week prior to the closure.
SEF Rev. 13_0815

Closure Restrictions
Full closure and detouring of freeway roads will be restricted to Full Freeway Closure Hours unless otherwise specified. The freeway may be closed to facilitate the removal of structures and erection of girders, storm sewer trunk line crossings, to perform work related to major traffic shifts and other work approved by the engineer. Provide signed detour routes, as shown in the plans, fully open and free of construction during all full freeway and system ramp closures.

To minimize the total number of full freeway closures for girder erection and bridge demolition activities, contractor is allowed extended full freeway closures between 10:00 PM and 5:00 AM Sunday through Thursday nights and between 11 PM and 7 AM for Friday and Saturday nights. A full freeway closure is defined as one direction of the freeway. Closing both directions of the freeway constitutes using two full freeway closures. A total of forty extended full freeway closures are allowed. Bridge superstructure demolition activities will require a full freeway closure in both directions. Lane rental assessments will apply to these closures. These closures are to be utilized only for bridge demolition and girder erection activities for the following bridges:

- Bluemound Road demolition and reconstruction
- Wisconsin Avenue demolition
- 92nd Street demolition and reconstruction
- SW ramp demolition
- 73rd Street pedestrian bridge demolition
- US 45 northbound temporary bridge over I-94 eastbound
- US 45 northbound temporary bridge over I-94 westbound

Do not close long term Bluemound Rd over USH 45 prior to October 16, 2014, or as directed by the engineer.

Do not close long term the northbound exit ramp to W. Wisconsin Avenue prior to October 16, 2014, or as directed by the engineer.

Do not close any freeway lanes long-term prior to October 16, 2014, or as approved by the engineer.

Complete the landscaping work, including but limited to, tree planting, seeding and mulch, and sodding along the berm south of Greenfield Avenue prior to November 21, 2014.

Do not close long term the existing Ramp SW prior to March 14, 2015, or as approved by the engineer.

Do not close long term the existing Ramp ES prior to March 14, 2015, and prior to the completion of all of the work necessary to activate dynamic message sign mounted on S-40-443, or as approved by the engineer.

Do not close long term Wisconsin Avenue until Bluemound Road is fully reopened to two traffic lanes in each direction including sidewalks.

Do not close long term 84th Street and the westbound exit and entrance ramp at 84th Street as shown in Stage 1A prior to October 16, 2014, or as approved by the engineer.

Do not close long term 92nd Street until 84th Street is reopened to traffic in each direction.

Do not close long term the eastbound exit ramp to S. 84th Street prior to March 1, 2016, or as approved by the engineer.

Do not close long term W. Kearney Street prior to March 1, 2016, or as approved by the engineer.

Do not close the I-94 westbound exit ramp to S. 84th Street and the I-94 westbound exit ramp to STH 100 at the same time.

Do not close the eastbound entrance ramp from 84th Street and the eastbound entrance ramp from STH 100 at the same time.

Do not move to Stage 3 in Section 2 (East Leg) until the I-94 westbound exit ramp to S. 84th Street is open to traffic.

All ramps at 84th Street shall be open to traffic during the Wisconsin State Fair, August 6, 2015 through August 16, 2015. Do not close the 84th Street westbound exit ramp after the 2015 State Fair other than during hours allowed in the lane rental table or within other areas of the prosecution and progress.

Do not close the westbound entrance ramp from 84th Street and the westbound entrance ramp from 70th Street at the same time.

IH 94 WEST may be closed between 70th Street and 84th Street for a onetime only continuous closure of IH 94 WEST within the weekend timeframe of 11:00 PM Friday night to 6:00 AM Sunday morning or 11:00 PM Saturday night to 5:00 AM Monday morning to facilitate the installation of storm sewer pipes P6652 & P6663 and storm sewer structure Z6661. Lane rental assessments will apply to this closure.

Ramp NW may be closed for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of Pier 1 of B-40-855. It is anticipated this closure will take place after IH 94 westbound traffic is shifted to temporary road EWD. Do not overlap the NW ramp seven calendar day closure with the allowed seven calendar day closure of the WN ramp. Lane rental assessments will not apply to this seven calendar day closure, but any additional closures needed to facilitate construction of Pier 1 of B-40-855 will require the use of lane rental credits or lane rental assessments.

Ramp WN may be closed for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of temporary road NEA adjacent to existing USH 45 northbound roadway. Do not overlap the WN seven day closure with the allowed seven day closure of the NW ramp. Lane rental assessments will not apply to this seven calendar day closure.

The eastbound I-94 exit ramp to 84th Street may be closed in Section 2, Stage 2 for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of storm sewer pipes P6354 and P6370A and drainage structures Z6370 and Z6374 located in that ramp. This closure will not be allowed during the State Fair. Lane rental assessments will not apply to this seven calendar day closure.

The westbound I-94 exit ramp to 84th Street southbound may be closed in Section 2, Stage 4A or 4B for a onetime only period within the weekend timeframe of 11 PM Friday night to 5:00 AM Monday morning to facilitate construction of concrete pavement located at the intersection of 84th Street and that ramp. Lane rental assessments will apply to this closure.

The westbound Watertown Plank Road entrance ramp to southbound US 45 may be closed in Section 1, Stage 4 for a onetime only period not to exceed 21 consecutive calendar days to facilitate construction of that ramp. Lane rental assessments will not apply to this 21 calendar day closure

The eastbound HWY100 entrance ramp to eastbound IH 94 may be closed in Section 1, Stage 2A for a onetime only period not to exceed 60 consecutive calendar days to facilitate construction of that ramp. Lane rental assessments will not apply to this 60 calendar day closure

Ramp SW steel erection operations over IH 94 west are allowed a onetime only continuous closure of IH 94 west within the weekend timeframe of 11:00 PM Friday night to 6:00 AM Sunday morning or 11:00 PM Saturday night to 5:00 AM Monday morning. Lane rental assessments will apply to this closure.

Ramp SW steel erection operations over IH 94 east and USH 45 south are allowed a onetime only continuous closure of IH 94 east and USH 45 south within the weekend timeframe of 11:00 PM Friday night to 5:00 AM Monday morning. This closure will not be allowed at the same time as the steel erection operations over IH 94 West. Lane rental assessments will apply to this closure.

Open the Southbound US45 exit ramp to Bluemound Road prior to September 4, 2015.

Eastbound IH 94 between 84th and the east end of the project may be reduced to two through lanes to facilitate roadway construction between Station 276EW+75 and Station 285EW+00. This closure will be allowed during Section 2 (East Leg) Stage 5, shall not take place prior to March 15, 2016 and shall not exceed 42 calendar days in duration.

Do not begin or continue any work that closes traffic lanes or ramps outside the allowed time periods specified in this contract. If the contractor fails to open freeway lanes of traffic and/or ramps to traffic by the specified times, assessments shown in the Lane Rental Assessment Table in the article Lane Rental Assessment will be placed upon the contractor based on the hourly rental rate for the closure type and hourly definition that the non-compliant closure occurs. The total assessment to the contractor will be the summation of the separate assessments for each lane and each ramp closure violation.

Permitting the contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the department of any of its rights under the contract.

Replace **Section 2 (East Leg)** under **Interim and Final Completion of Work** with the following:

Section 2 (East Leg) is defined as the removal of B-40-90; the construction of B-40-864, R-40-551 phase 2, R-40-552 phase 2, R-40-554, and R-40-619; I-94 EB between Station EW211+64 and Station EW285+25 as shown in the Stage 4A and Stage 5 plans; 84th Street between Station F35+24.89 and Station F42+92 as shown in the Stage 4A & 4B plans; Adler Street, Kearney Street, the EB entrance ramp from 84th Street, the EB exit ramps to 84th and 70th Streets as shown in Stage 4A plans.

Add the following paragraphs after section **Interim Completion of Work 5/22/2015**:

Interim Completion of Work 8/6/2015
Supplement subsection 108.11 of the standard specifications as follows.

If the contractor fails to complete all of the work necessary to open the I-94 exit and entrance ramps to 84th Street prior to 12:01 AM on August 6, 2015, the department will assess the contractor $50,000 in interim liquidated damages per day for each calendar day after 12:01 AM on August 6, 2015, the ramps are not open. An entire calendar day will be charged for any period of time within a calendar day that the ramp remains closed beyond 12:01 AM on August 6, 2015.

Replace the heading **Interim Completion of Work 84th Street Ramp** with the following:

Interim Completion of Work 84th Street EB Exit Ramp

Replace the heading **Interim Completion of Work EB I-94** with the following:

Interim Completion of Work EB I-94 Lane Reduction Stage 5

6. Traffic.

Replace **Section 2 (East Leg)** under **Schedule of Operations** with the following:

Section 2 (East Leg) is defined as the removal of B-40-90; the construction of B-40-864, R-40-551 phase 2, R-40-552 phase 2, R-40-554, and R-40-619; I-94 EB between Station EW211+64 and Station EW285+25 as shown in the Stage 4A and Stage 5 plans; 84th Street between Station F35+24.89 and Station F42+92 as shown in the Stage 4A & 4B plans; Adler Street, Kearney Street, the EB entrance ramp from 84th Street, the EB exit ramps to 84th and 70th Streets as shown in Stage 4A plans.

13. Hauling Restrictions.

Replace entire spec with the following:

13. Hauling Restrictions.

Replace standard spec 107.2 with the following:

Approved local street haul routes are shown on the Local Road Haul Routes Overview Plan.

If additional haul routes are needed that are not shown on the Local Road Haul Routes Overview Plan, or part of the state trunk highway system, present a proposed haul route plan detailing any additional haul routes 5 business days in advance of any proposed hauling to the department. The additional haul route submittal shall include the months, days of the week, time of day, number of trucks, types of trucks and maximum loads of trucks anticipated to accomplish the project work.

The department will review the submittal and approve or provide a letter with comments and proposed revisions to the contractor within 5 business days of its receipt. . If approved, the department will subsequently survey the existing condition of that haul route to establish a baseline for assessing damage that the contractor's hauling operations might cause.

At all times, conduct operations in a manner that will cause a minimum of disruption to traffic on existing roadways.

79. Temporary Shoring B-40-855, Item 511.1200.0001; Temporary Shoring R-40-524, Item 511.1200.0002; Temporary Shoring R-40-551, Item 511.1200.0003; Temporary Shoring R-40-552, Item 511.1200.0004; Temporary Shoring 24FCB+78 to 32FCB+19, Item 511.1300.0001; Temporary Shoring 41FCB+67 to 45FCB+07, Item 511.1300.0002; Temporary Shoring 344NS+62 to 346NS+00, Item 511.1300.0003; Temporary Shoring 595SW+59 to 595SW+78, Item 511.1300.0004; Temporary Shoring 317NS+85 to 318NS+20, Item 511.1300.0005; Temporary Shoring 321NS+38 to 323NS+97, Item 511.1300.0006; Temporary Shoring 326NS+28 to 327NS+14, Item 511.1300.0007; Temporary Shoring 269EW+98 to 279EW+44, Item 511.1300.0008; Temporary Shoring 273EW+97 to 279EW+25, Item 511.1300.0009; Temporary Shoring 313NS+33 to 318NS+00, Item 511.1300.0010; Temporary Shoring 232EW+65 to 233EW+15, Item 511.1300.0011; Temporary Shoring 233EW+76 to 234EW+26, Item 511.1300.0012; Temporary Shoring 152EW+14 to 152EW+71, Item 511.1300.0013; Temporary Shoring 802BB+15 to 802BB+36, Item 511.1300.0014; Temporary Shoring 802BB+16 to 802BB+58, Item 511.1300.0015; Temporary Shoring 802BB+58 to 803BB+00, Item

511.1300.0016; Temporary Shoring 802BB+80 to 803BB+01, Item 511.1300.0017; Temporary Shoring Left in Place B-40-855, Item 511.2200.0001; Temporary Shoring Left in Place B-40-789, Item 511.2200.0002; Temporary Shoring Left in Place R-40-525, Item 511.2200.0003; Temporary Shoring Left in Place R-40-536, Item 511.2200.0004.

Replace entire spec with the following:

79. Temporary Shoring B-40-855, Item 511.1200.0001; Temporary Shoring R-40-524, Item 511.1200.0002; Temporary Shoring R-40-551, Item 511.1200.0003; Temporary Shoring R-40-552, Item 511.1200.0004; Temporary Shoring 24FCB+78 to 32FCB+19, Item 511.1300.0001; Temporary Shoring 41FCB+67 to 45FCB+07, Item 511.1300.0002; Temporary Shoring 344NS+62 to 346NS+00, Item 511.1300.0003; Temporary Shoring 595SW+59 to 595SW+78, Item 511.1300.0004; Temporary Shoring 317NS+85 to 318NS+20, Item 511.1300.0005; Temporary Shoring 321NS+38 to 323NS+97, Item 511.1300.0006; Temporary Shoring 326NS+28 to 327NS+14, Item 511.1300.0007; Temporary Shoring 269EW+98 to 279EW+44, Item 511.1300.0008; Temporary Shoring 273EW+97 to 279EW+25, Item 511.1300.0009; Temporary Shoring 313NS+33 to 318NS+00, Item 511.1300.0010; Temporary Shoring 232EW+65 to 233EW+15, Item 511.1300.0011; Temporary Shoring 233EW+76 to 234EW+26, Item 511.1300.0012; Temporary Shoring 152EW+14 to 152EW+71, Item 511.1300.0013; Temporary Shoring 802BB+15 to 802BB+36, Item 511.1300.0014; Temporary Shoring 802BB+16 to 802BB+58, Item 511.1300.0015; Temporary Shoring 802BB+58 to 803BB+00, Item 511.1300.0016; Temporary Shoring 802BB+80 to 803BB+01, Item 511.1300.0017; Temporary Shoring 7FCV+83 to 9FCV+53, Item 511.1300.0018; Temporary Shoring 9FCV+21 to 10FCV+76, Item 511.1300.0019; Temporary Shoring Left in Place B-40-855, Item 511.2200.0001; Temporary Shoring Left in Place B-40-789, Item 511.2200.0002; Temporary Shoring Left in Place R-40-525, Item 511.2200.0003; Temporary Shoring Left in Place R-40-536, Item 511.2200.0004.

A Description

This special provision describes designing and providing temporary shoring at locations the plans show.

B Materials

Provide a shoring design for each location where the plan requires temporary shoring. Conform to AASHTO Load and Resistance Factor Design Specifications and the WisDOT Bridge Manual. Design to address all limit states using a design life of 36 months or the project specific duration, whichever is greater. Have a professional engineer, registered in the state of Wisconsin and knowledgeable of the specific site conditions and requirements, verify the adequacy of the design. Submit one copy of each shoring design, signed and sealed by the same professional engineer verifying the design, to the engineer for incorporation into the permanent project record.

C Construction

Provide temporary shoring at each required location conforming to the design developed for that location as follows:

Under the Temporary Shoring (structure) bid items: for temporary shoring associated with structure ID numbers identified in the bid item supplemental descriptions.

Under the Temporary Shoring (location) bid items: for temporary shoring associated with roadway locations identified in the bid item supplemental descriptions.

Remove temporary shoring no longer needed unless the engineer allows it to remain in place. Under the left-in-place bid items, leave the shoring in place. Place backfill conforming to standard spec 206.3.13 in excavated space not occupied by the new permanent construction.

D Measurement

The department will measure the Temporary Shoring bid items by the square foot, acceptably completed at locations the plans show, measured as the area of exposed face in the plane of the shoring from the ground line in front of the shoring to a maximum of one foot above the retained grade. Shoring used for staged construction in multiple configurations without removal and reinstallation will be measured once based on the configuration with the largest area of exposed face.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
511.1200.0001	Temporary Shoring B-40-855	SF
511.1200.0002	Temporary Shoring R-40-524	SF
511.1200.0003	Temporary Shoring R-40-551	SF
511.1200.0004	Temporary Shoring R-40-552	SF
511.1300.0001	Temporary Shoring 24FCB+78 to 32FCB+19	SF
511.1300.0002	Temporary Shoring 41FCB+67 to 45FCB+07	SF
511.1300.0003	Temporary Shoring 344NS+62 to 346NS+00	SF
511.1300.0004	Temporary Shoring 595SW+59 to 595SW+78	SF
511.1300.0005	Temporary Shoring 317NS+85 to 318NS+20	SF
511.1300.0006	Temporary Shoring 321NS+38 to 323NS+97	SF
511.1300.0007	Temporary Shoring 326NS+28 to 327NS+14	SF
511.1300.0008	Temporary Shoring 269EW+98 to 279EW+44	SF
511.1300.0009	Temporary Shoring 273EW+97 to 279EW+25	SF
511.1300.0010	Temporary Shoring 313NS+33 to 318NS+00	SF
511.1300.0011	Temporary Shoring 232EW+65 to 233EW+15	SF
511.1300.0012	Temporary Shoring 233EW+76 to 234EW+26	SF
511.1300.0013	Temporary Shoring 152EW+14 to 152EW+71	SF
511.1300.0014	Temporary Shoring 802BB+15 to 802BB+36	SF
511.1300.0015	Temporary Shoring 802BB+16 to 802BB+58	SF
511.1300.0016	Temporary Shoring 802BB+58 to 803BB+00	SF
511.1300.0017	Temporary Shoring 802BB+80 to 803BB+01	SF
511.1300.0018	Temporary Shoring 7FCV+83 to 9FCV+53	SF
511.1300.0019	Temporary Shoring 9FCV+21 to 10FCV+76	SF
511.2200.0001	Temporary Shoring Left in Place B-40-855	SF
511.2200.0002	Temporary Shoring Left in Place B-40-789	SF
511.2200.0003	Temporary Shoring Left in Place R-40-525	SF
511.2200.0004	Temporary Shoring Left in Place R-40-536	SF

Payment for the Temporary Shoring bid items is full compensation for designing and providing shoring; for providing a signed and sealed copy of the design; for removal or additional work required to leave in place; and for backfilling.

The department will not pay for temporary shoring for locations the plans do not show.

123. Temporary Traffic Signals for Intersections.

Replace entire spec with the following:

123. Temporary Traffic Signals for Intersections, IH 94 EB Ramps & STH 181, Item 661.0200.3001; IH 94 WB Ramps & STH 181, Item 661.0200.3002.

Replace standard spec 661.2.1 paragraphs (1) and (3) with the following:

(1) Inspect the existing temporary traffic signal installation and inform the engineer of any defects or deficiencies. It shall be the 1060-33-78 contractor's responsibility to correct any defects or deficiencies prior to surrendering the temporary traffic signal to the contractor for project 1060-33-80. Assume ownership of all temporary traffic signal equipment as shown on the plan, except for adaptable traffic signal equipment and traffic signal cabinet and controller which will remain property of WisDOT, after all defects and deficiencies have been corrected. The signal controller will be capable of operating with the video camera detection system and Emergency Vehicle Preemption (EVP) system. All wood poles shall be plumb and level. The department will be responsible for all temporary traffic signal timings. Provide the department a minimum five (5) working advance notice prior to needing all timings and/or timing changes. The department may request traffic signal timing changes to an approved incident timing plan during the project. The department will implement any approved incident timing plan immediately upon notification of the change and immediately upon notification of switching the timing plan back to normal operation. The department will record the times of operation of the incident timing and subsequent return to normal operation.

(3) The temporary electrical service has been installed under project 1060-33-78. The department will pay for all installation and energy costs associated with the operation of the temporary traffic signal. Contact Justin Effinger at (262) 548-5676 with any temporary electrical service issues.

Add the following to standard spec 661.2.1:

(5) WisDOT retains ownership, installation, and maintenance responsibilities of the video image detector system consisting of video image detector cameras, mounting brackets and hardware, power cable, video image processor card, adaptable traffic signal equipment, and auxiliary equipment to make the video detector system fully operational. A third party contractor arranged by WisDOT will make all necessary adjustments to the adaptable traffic signal equipment.

Add the following to standard spec 661.3.1:

(4) WisDOT retains ownership, installation, and maintenance responsibilities of the temporary video detection cameras at the locations shown on the plans. WisDOT retains ownership, installation, and maintenance responsibilities of the power cable and signal cabinet equipment. A third party contractor will assist the department in aiming the video cameras to provide detection at the location shown on the plans and make the video detector system fully operational.

(5) In the event, at installation or turn on date, a noticeable obstruction is present in line with the video detection zone(s), advise the engineer before WisDOT's third party contractor sets the zone.

(6) The video camera will be mounted on a wooden pole. WisDOT's third party contractor will relocate the video camera to a suitable location if there is impedance on the sensor operation, construction related or otherwise.

(7) The video detection system, as shown in the traffic signal construction plans, will be complete, in place, tested, and in full operation during each stage and sub-stage of construction.

Replace standard spec 661.3.1.1(2) with the following:

(2) Place the pole in the ground to no less than 1/5 of the pole's length as the plans show. Sawcut existing pavement and concrete curb and gutter as needed to install the wood poles and guy wire anchors. Sawcut existing pavement in accordance to the pertinent provisions in Section 690.3, Construction. Remove pavement and concrete curb and gutter as shown on the plans and if needed to install the wood poles and guy wire anchors. Remove only as much pavement as needed to install the wood poles. Remove pavement and curb and gutter in accordance to the pertinent provisions in Section 204.3, Construction. Hold any wood poles in place and/or move wood poles during construction due to conflicts with proposed work.

Replace standard spec 661.3.1.4(1) with the following:

(1) Obtain all span wire checks from the contractor for project 1060-33-78. Arrange for every other week inspections with the engineer to check the height of the span wire above the roadways to ensure that the bottom of the traffic signal heads remain within the minimum and maximum heights allowed above the roadway. Make all height adjustments within 1-hour of an inspection indicating that adjustments are required. Notify the engineer in writing upon completion of all necessary adjustments. Maintain a written log to properly document the date of each every other week inspection, the heights above the roadway, the roadway clearance after adjustments have been made and acceptance by the engineer. Provide all documentation related to the every other week span wire height checks as well as all records related to maintenance performed on the temporary traffic signal installations to the engineer upon project completion.

Add the following to standard spec 661.3.1.4:

(4) The department will maintain all temporary vehicle detection zones as the plans show or as the engineer directs. The temporary vehicle detection zones will be set near the vicinity and within the approximate distance from the stop bar as shown on the plans. The department will check temporary vehicle detection zones at a minimum every other week and at the opening of each stage of temporary traffic signal operation to ensure that they are working and are aimed properly. The department will check and/or adjust temporary vehicle detection zones immediately upon notification by the department and/or construction team that the video detection system is not operating correctly. Periodic adjustment of the detection zones and/or moving of the temporary vehicle detection sensors may be required due to changes in traffic control, staging, or other construction operations.

The department will ensure that the temporary vehicular detection system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

Add the following to standard spec 661.3.2.6:

(6) Remove the video detection system from the temporary traffic signal poles and cabinet and deliver to the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for delivering the materials five (5) working days prior to delivering the materials.

(7) Deliver the temporary traffic signal communication equipment; traffic signal cabinet and controller; and all adaptable traffic signal equipment to the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for delivering the materials five (5) working days prior to delivering the materials.

Replace standard spec 661.5(2) with the following:

(2) Payment for the Temporary Traffic Signals for Intersections bid item is full compensation for assuming ownership, operating, maintaining, and repairing the complete temporary installation; and for removal. Payment also includes the following:

1. Furnishing and installing the replacement equipment.
2. The cost of delivery and pick-up of the cabinet assemblies.
3. Removal of service and site restoration.

Payment is full compensation for drilling holes; assuming ownership of most materials, including bricks, and coarse aggregate; for excavation, bedding, and backfilling, including any sand or other required materials; furnishing and placing topsoil, fertilizer, seed, and mulch in disturbed areas; for properly disposing of surplus materials; for making inspections; for removing the temporary vehicle detector system and delivering it to the department; for removing and delivering the temporary traffic

signal communication equipment, traffic signal cabinet and controller, and all adaptable traffic signal equipment to the department; for cleaning up and properly disposing of waste; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

159. Salvaging Crash Cushion, Item SPV.0060.0100.

Replace **A Description** with the following:

A Description
This special provision describes maintaining, removing and salvaging existing crash cushions in accordance to the pertinent provisions of standard spec 204 and as hereinafter provided.

Replace paragraph 1 of **C Construction** with the following:

Maintain crash cushions left in place from a previous contract until removal. The existing crash cushions shall be removed and salvaged as shown on the plans. The contractor shall include the cost of any and all methods that may be needed for the expected removal of the materials under this bid item.

Replace **E Payment** with the following:

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0100	Salvaging Crash Cushion	Each

Payment is full compensation for maintaining, removing and delivering existing crash cushions.

303. Maintain Concrete Barrier Temporary Precast, Item SPV.0090.0125.

Replace entire spec with the following:

303. Maintain Concrete Barrier Temporary Precast, Item SPV.0090.0125.

A Description
This special provision describes maintaining existing concrete barrier temporary precast including any attached temporary glare screen reflectors and crash cushions. The temporary barrier has been left in place under a previous contract. Assume ownership and responsibility of the temporary barrier, temporary glare screen reflectors and crash cushions upon the contract's Notice to Proceed. The location of this temporary barrier is shown in the Traffic Control plans.

Concrete barrier temporary precast including any attached temporary glare screen reflectors and crash cushions that are to remain in place at the end of this contract as shown in the Traffic Control plans becomes property of the department after final acceptance by the engineer.

B Materials
The concrete barrier temporary precast left in place from a previous project is Wisconsin type concrete barrier temporary precast.

C Construction
Maintain Wisconsin type concrete barrier temporary precast left in place in accordance to standard spec 603.

Realign the wall after snow plow operations or as directed by the engineer. Maintain reflectors and hardware in a condition similar to when new on the project. Replace crash cushions as directed by the engineer.

D Measurement
The department will measure Maintain Concrete Barrier Temporary Precast by the linear foot of concrete barrier temporary precast, acceptably maintained.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.0125	Maintain Concrete Barrier Temporary Precast	LF

Payment is full compensation for receiving, maintaining, and leaving on the project site concrete barrier temporary precast including any attached temporary glare screen reflectors and crash cushions.

373. DELETED.

410. Temporary Traffic Signals for Intersections, IH 94 WB Ramps & STH 181, Item 661.0200.3003.

Replace standard spec 661.2.1 paragraphs (1) and (3) with the following:

(1) Furnish all temporary traffic signal equipment as shown on the plan except for the traffic signal cabinet and controller. Use the traffic signal cabinet, controller, and temporary communication equipment provided by the Department. The contractor provided equipment can be salvaged from the temporary traffic signal removed during earlier stages of construction. The signal controller will be capable of operating with the video camera detection system and Emergency Vehicle Preemption (EVP) system. Pick up the department furnished traffic signal cabinet, controller, and temporary communication equipment at the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for picking up the department furnished materials five (5) working days prior to picking up the materials. All wood poles shall be plumb and level. The department will be responsible for all temporary traffic signal timings. Provide the department a minimum five (5) working advance notice prior to needing all timings and/or timing changes. The department may request traffic signal timing changes to an approved incident timing plan during the project. The department will implement any approved incident timing plan immediately upon notification of the change and immediately upon notification of switching the timing plan back to normal operation. The department will record the times of operation of the incident timing and subsequent return to normal operation.

(3) The department has initiated the installation of the temporary electrical service with the electrical utility at the intersection of IH 94 WB Ramps & STH 181 (S. 84th Street) to expedite the process. Contact Justin Effinger at (262) 548-5676 to coordinate the temporary electrical service. The department will pay for all installation and energy costs associated with the operation of the temporary traffic signal. Contact the electrical utility and arrange timely installation of the temporary service.

Add the following to standard spec 661.2.1:

(5) WisDOT retains ownership, installation, and maintenance responsibilities of the video image detector system consisting of video image detector cameras, mounting brackets and hardware, power cable, video image processor card, adaptable traffic signal equipment, and auxiliary equipment to make the video detector system fully operational. A third party contractor arranged by WisDOT will make all necessary adjustments to the adaptable traffic signal equipment.

(6) Furnish pedestrian signal faces in accordance to 658.2.3 of the standard specifications.

(7) Furnish pedestrian push buttons in accordance to 658.2.5 of the standard specifications.

(8) Re-use the salvaged EVP equipment from the temporary traffic signal removed during earlier stages of construction.

Add the following to standard spec 661.3.1:

(4) WisDOT retains ownership, installation, and maintenance responsibilities of the temporary video detection cameras at the locations shown on the plans. WisDOT retains ownership, installation, and maintenance responsibilities of the power cable and signal cabinet equipment. A third party contractor will assist the department in aiming the video cameras to provide detection at the location shown on the plans and make the video detector system fully operational.

(5) In the event, at installation or turn on date, a noticeable obstruction is present in line with the video detection zone(s), advise the engineer before WisDOT's third party contractor sets the zone.

(6) The video camera will be mounted on a wooden pole. WisDOT's third party contractor will relocate the video camera to a suitable location if there is impedance on the sensor operation, construction related or otherwise.

(7) The video detection system, as shown in the traffic signal construction plans, will be complete, in place, tested, and in full operation during each stage and sub-stage of construction.

(8) Install pedestrian signal faces on the wood pole or wood post as the plans show. Maintain the height to the bottom of the pedestrian signal face as indicated in SDD Traffic Signal Standard Poly Bracket Mountings (Typical) 13 FT. or 15 FT.

(9) Install pedestrian push buttons in accordance to 658.3.5 of the standard specifications. Mount push buttons so that they are wheelchair accessible from the temporary crossing areas and in accordance with MUTCD Chapter 4.

(10) Install department supplied temporary communication equipment on the temporary traffic wood poles and in the cabinet. Coordinate and verify that the department has an established temporary communication connection for implementation of temporary traffic signal timings.

(11) Determine a suitable location for the salvaged temporary EVP detectors for each stage and sub-stage of construction and install the detectors. Detectors may be mounted on the temporary traffic signal span wire or wood poles. Relocate the temporary EVP detectors to a suitable location if construction activities and/or construction staging changes impede the detector operation. Arrange for testing of equipment prior to acceptance of the installation for each construction stage. All cables associated with the temporary vehicle detection system shall be routed to the cabinet. Each lead shall be appropriately marked as to which EVP channel it is associated.

Replace standard spec 661.3.1.1(2) with the following:

(2) Place the pole in the ground to no less than 1/5 of the pole's length as the plans show. Sawcut existing pavement and concrete curb and gutter as needed to install the wood poles and guy wire anchors. Sawcut existing pavement in accordance to the pertinent provisions in Section 690.3, Construction. Remove pavement and concrete curb and gutter as shown on the plans and if needed to install the wood poles and guy wire anchors. Remove only as much pavement as needed to install the wood poles. Remove pavement and curb and gutter in accordance to the pertinent provisions in Section 204.3, Construction. Hold any wood poles in place and/or move wood poles during construction due to conflicts with proposed work.

Replace standard spec 661.3.1.4(1) with the following:

(1) Arrange for every other week inspections with the engineer to check the height of the span wire above the roadways to ensure that the bottom of the traffic signal heads remain within the minimum and maximum heights allowed above the roadway. Make all height adjustments within 1-hour of an inspection indicating that adjustments are required. Notify the engineer in writing upon completion of all necessary adjustments. Maintain a written log to properly document the date of each every other week inspection, the heights above the roadway, the roadway clearance after adjustments have been made and acceptance by the engineer. Provide all documentation related to the every other week span wire height checks as well as all records related to maintenance performed on the temporary traffic signal installations to the engineer.

Add the following to standard spec 661.3.1.4:

(4) The department will maintain all temporary vehicle detection zones as the plans show or as the engineer directs. The temporary vehicle detection zones will be set near the vicinity and within the approximate distance from the stop bar as shown on the plans. The department will check temporary vehicle detection zones at a minimum every other week and at the opening of each stage of temporary traffic signal operation to ensure that they are working and are aimed properly. The department will check and/or adjust temporary vehicle detection zones immediately upon notification by the department and/or construction team that the video detection system is not operating correctly. Periodic adjustment of the detection zones and/or moving of the temporary vehicle detection sensors may be required due to changes in traffic control, staging, or other construction operations.

The department will ensure that the temporary vehicular detection system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

(5) Periodic adjustment and/or moving of the temporary EVP detectors may be required due to changes in traffic control, staging, or other construction operations.

Ensure that the temporary EVP system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

Add the following to standard spec 661.3.2.6:

(6) Remove the video detection system from the temporary traffic signal poles and cabinet and deliver to the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for delivering the materials five (5) working days prior to delivering the materials.

(7) Deliver the temporary traffic signal communication equipment; traffic signal cabinet and controller; and all adaptable traffic signal equipment to the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266-1170 and make arrangements for delivering the materials five (5) working days prior to delivering the materials.

(8) Remove the temporary EVP system.

Replace standard spec 661.5(2) with the following:

(2) Payment for the Temporary Traffic Signals for Intersections bid item is full compensation for providing, operating, maintaining, and repairing the complete temporary installation; and for removal. Payment also includes the following:

1. Furnishing and installing the replacement equipment.

2. The cost of delivery and pick-up of the cabinet assemblies.
3. Removal of service and site restoration.

Payment is full compensation for drilling holes; furnishing and installing all contractor provided materials, including bricks, and coarse aggregate; for picking up and installing all department furnished materials; for excavation, bedding, and backfilling, including any sand or other required materials; furnishing and placing topsoil, fertilizer, seed, and mulch in disturbed areas; for properly disposing of surplus materials; for making inspections; for removing the temporary vehicle detector system and delivering it to the department; for removing and delivering the temporary traffic signal communication equipment, traffic signal cabinet and controller, and all adaptable traffic signal equipment to the department; for cleaning up and properly disposing of waste; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

411. Traffic Control Full Freeway Closure, Item SPV.0060.0408.

A Description
This item shall consist of furnishing the labor and equipment required for closing and subsequently opening the freeway accordance to section 643 of the standard specifications, the plans, and as directed by the engineer. Drums, barricades and signs may remain along the outside edge of the freeway shoulder when the freeway is open to traffic. Signs shall not be visible to traffic when the freeway is open. Drums, barricades, lights, arrow boards and signs will be paid for separately under the various traffic control items.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Traffic Control Full Freeway Closure by each individual freeway closure that is set up and subsequently removed in each traffic direction within a 24 hour time period, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0408	Traffic Control Full Freeway Closure	Each

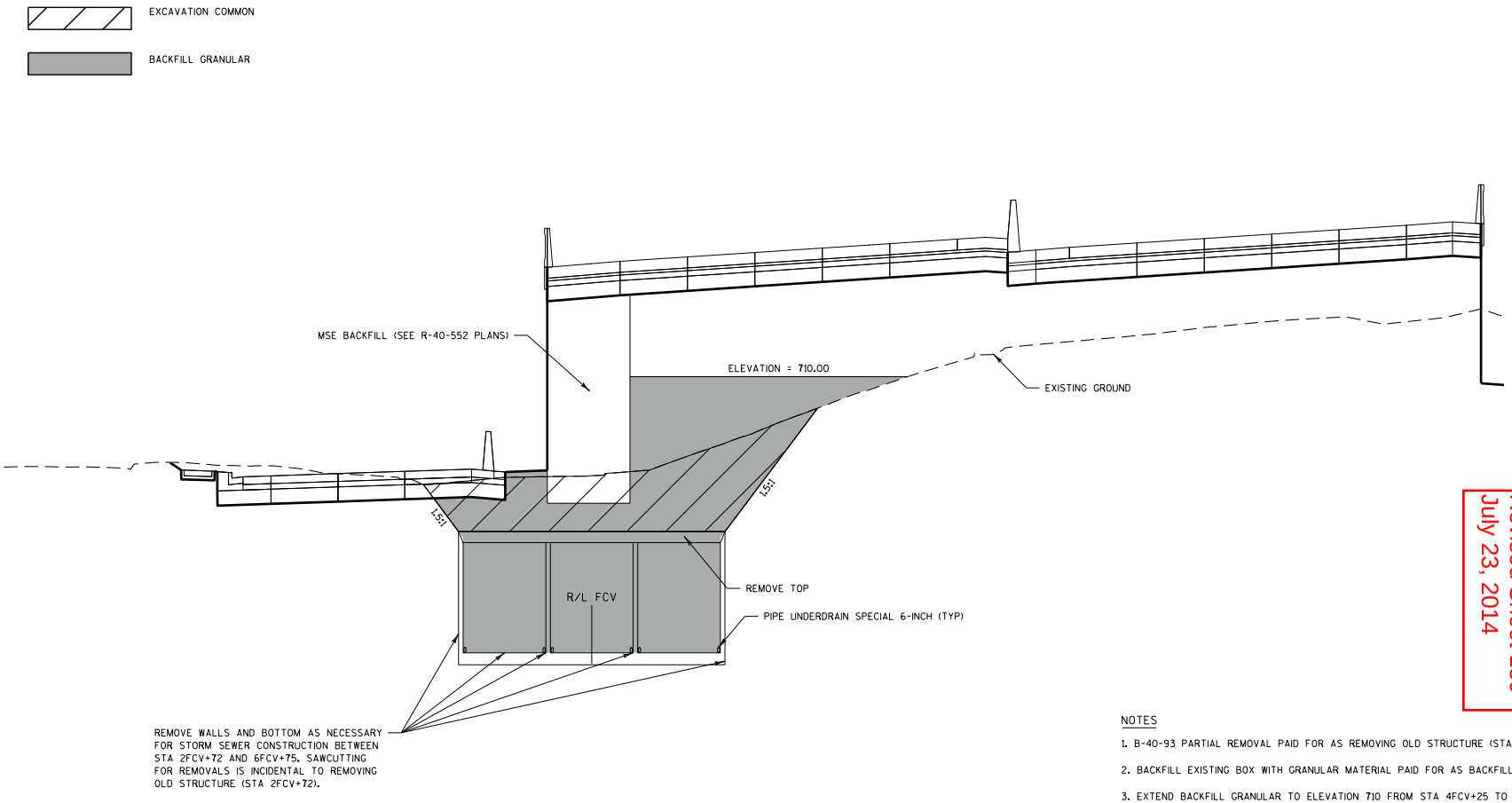
Payment is full compensation for closing and subsequently opening the freeway. Drums, barricades, lights, arrow boards and signs will be paid for separately under the various traffic control items.

Schedule of Items
Attached, dated July 23, 2014, are the revised Schedule of Items Pages 1 - 112.

Plan Sheets
The following 8½ x 11-inch sheets are attached and made part of the plans for this proposal:
Revised: 189, 300, 301, 1013, 1025 – 1035, 1274, 1313, 1315, 1316, 1321, 1323, 1324, 1373, 1504, 1515, 1583, 1711, 1712, 1731, 1830, 1831, 3382

END OF ADDENDUM

2

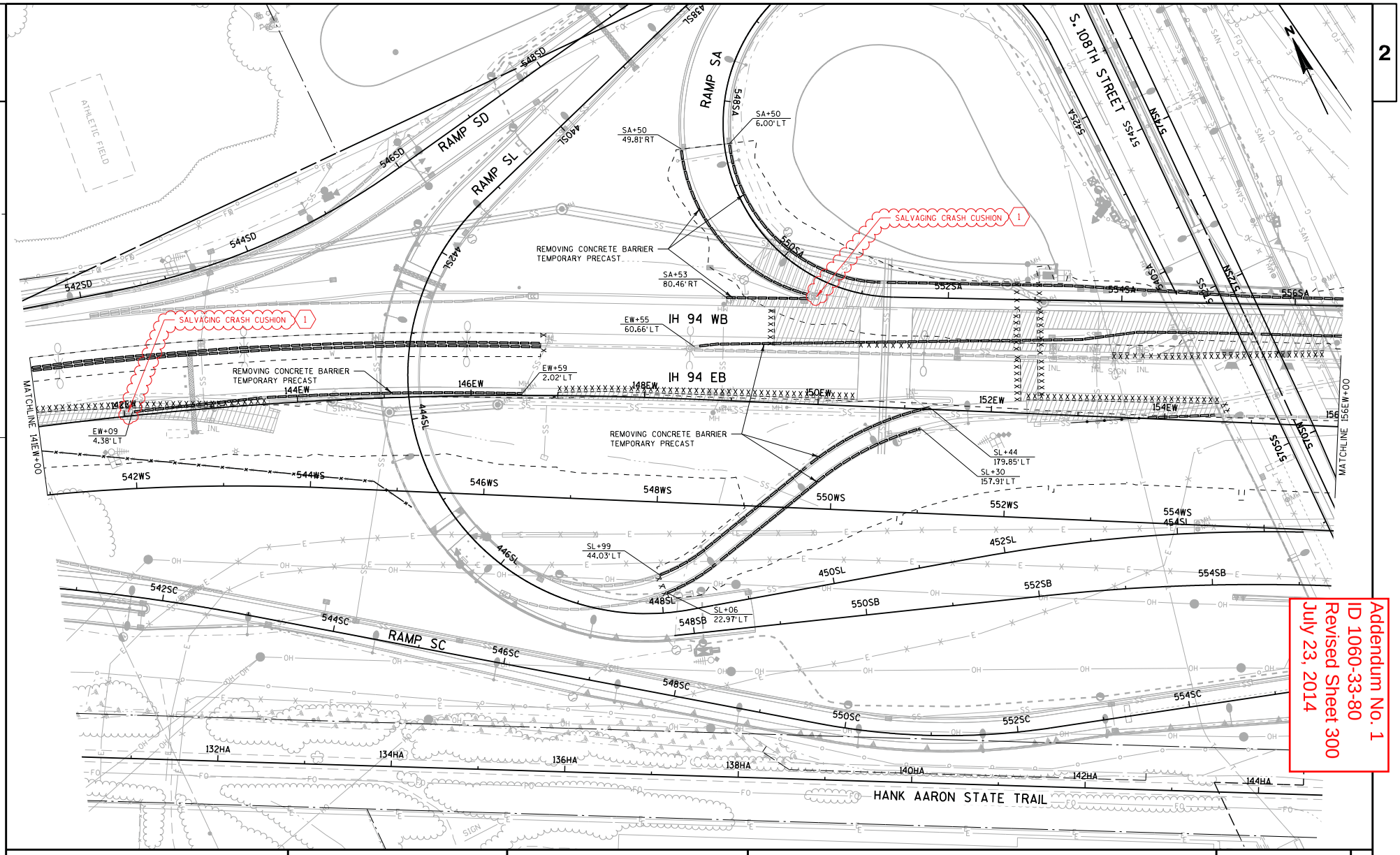


Addendum No. 1
ID 1060-33-80
Revised Sheet 189
July 23, 2014

B-40-93 PARTIAL REMOVAL

NOTES

1. B-40-93 PARTIAL REMOVAL PAID FOR AS REMOVING OLD STRUCTURE (STA 2FCV+72).
2. BACKFILL EXISTING BOX WITH GRANULAR MATERIAL PAID FOR AS BACKFILL GRANULAR.
3. EXTEND BACKFILL GRANULAR TO ELEVATION 710 FROM STA 4FCV+25 TO STA 13FCV+00.
4. SPECIAL COMPACTION REQUIRED STA 238EW+37 TO STA 247EW+00.
1. 5. PAYMENT INCLUDES REMOVAL OF WINGWALLS FROM STA 2FCV+16 TO STA 2FCV+81 LT/RT.

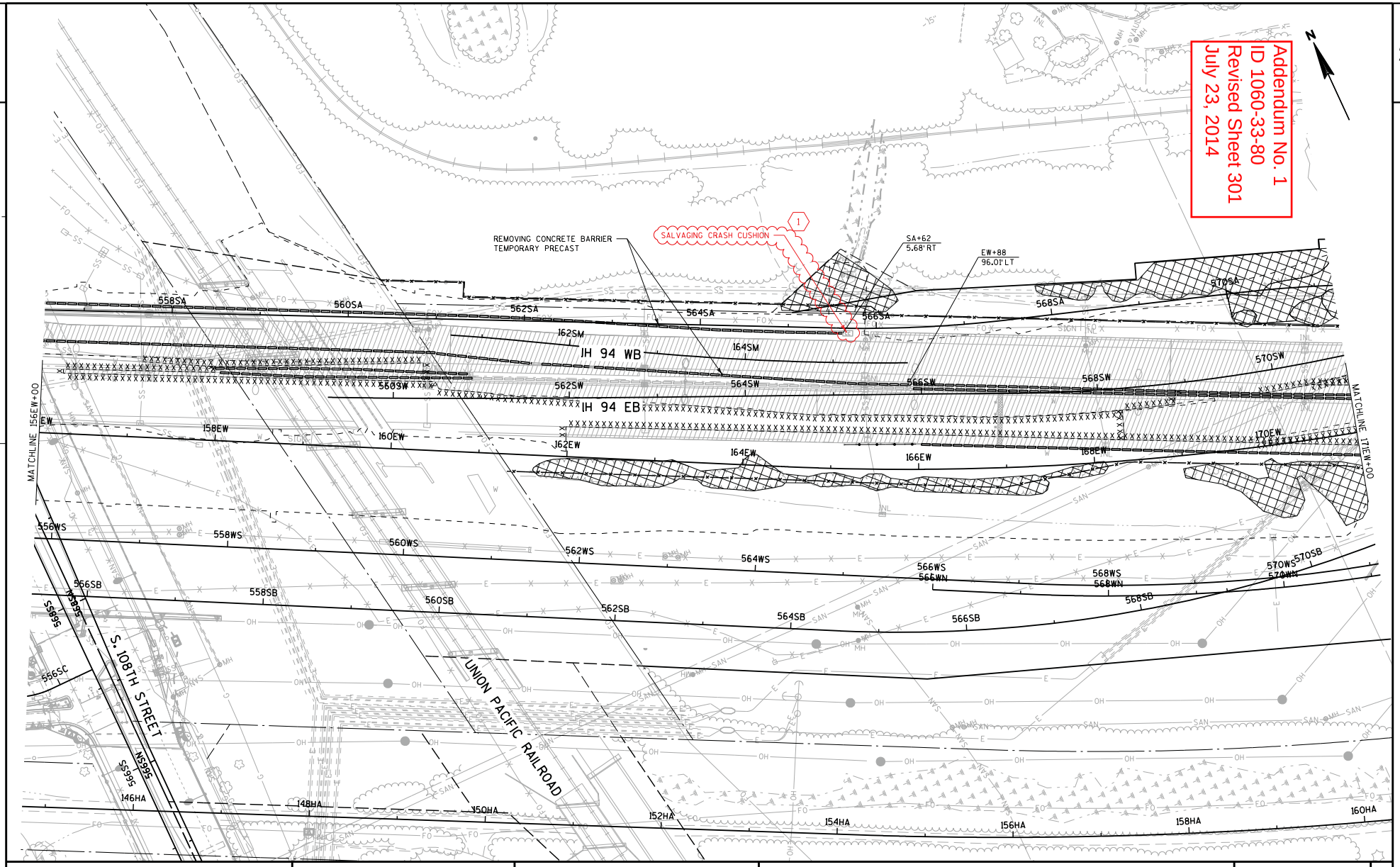


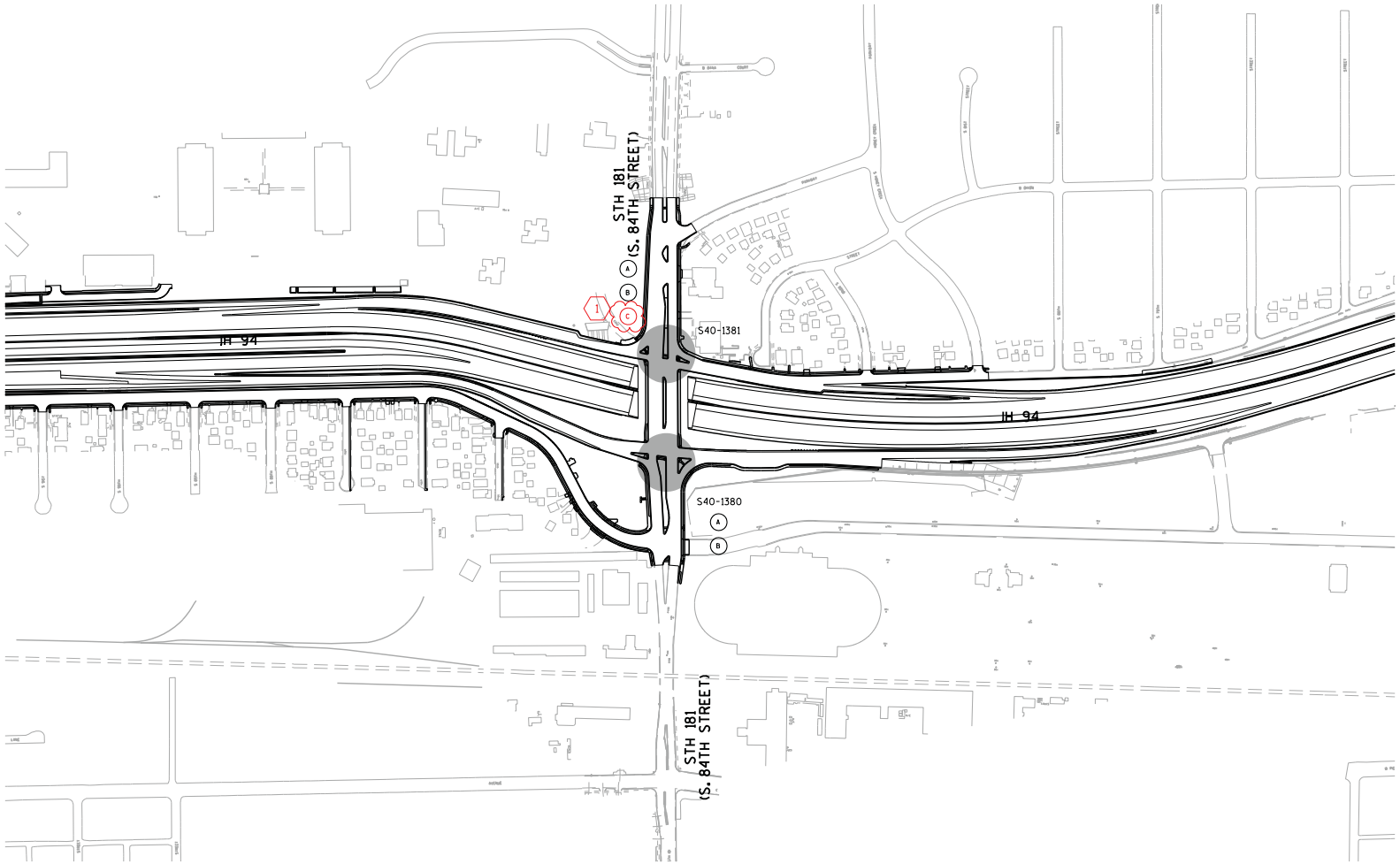
Addendum No. 1
ID 1060-33-80
Revised Sheet 300
July 23, 2014

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	REMOVAL PLANS	SHEET 300	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\021117_rm.dgn PLOT DATE : 22-JUL-2014 13:18 PLOT BY : MSCDYB PLOT NAME : 021117_rm PLOT SCALE : 100:1

WISDOT/CADDS SHEET 42


Addendum No. 1
ID 1060-33-80
Revised Sheet 301
July 23, 2014
REMOVING CONCRETE BARRIER
TEMPORARY PRECAST
SALVAGING CRASH CUSHION
SA+62
5.68' RT
EW+88
96.01' LT
IH 94 WB
IH 94 EB
S. 108TH STREET
UNION PACIFIC RAILROAD
MATCHLINE 156EW+00
MATCHLINE 172EW+00
558SA
560SA
562SA
564SA
566SA
568SA
570SA
162SM
164SM
558SW
562SW
564SW
566SW
568SW
570SW
158EW
160EW
162EW
164EW
166EW
168EW
170EW
556WS
558WS
560WS
562WS
564WS
566WS
566WN
568WS
568WN
570WS
570WN
570SB
566SB
558SB
560SB
562SB
564SB
566SB
568SB
556SC
146HA
148HA
150HA
152HA
154HA
156HA
158HA
160HA
PROJECT NO: 1060-33-80
HWY: IH 894/IH 94/USH 45
COUNTY: MILWAUKEE
REMOVAL PLANS
SHEET 301
E
FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\021118_rm.dgn
PLOT DATE : 22-JUL-2014 13:18
PLOT BY : MSCDYB
PLOT NAME : 021118_rm
PLOT SCALE : 100:1
WISDOT/CADDS SHEET 42



LEGEND

WISDOT OWNED PERMANENT TRAFFIC SIGNAL
(FORMER CITY OF MILWAUKEE OWNED TRAFFIC SIGNAL)
SXXXX

(A) ASSUME TEMPORARY TRAFFIC SIGNAL OWNERSHIP FROM 1060-33-78 PROJECT
(LEFT IN PLACE UPON 1060-33-78 PROJECT COMPLETION)

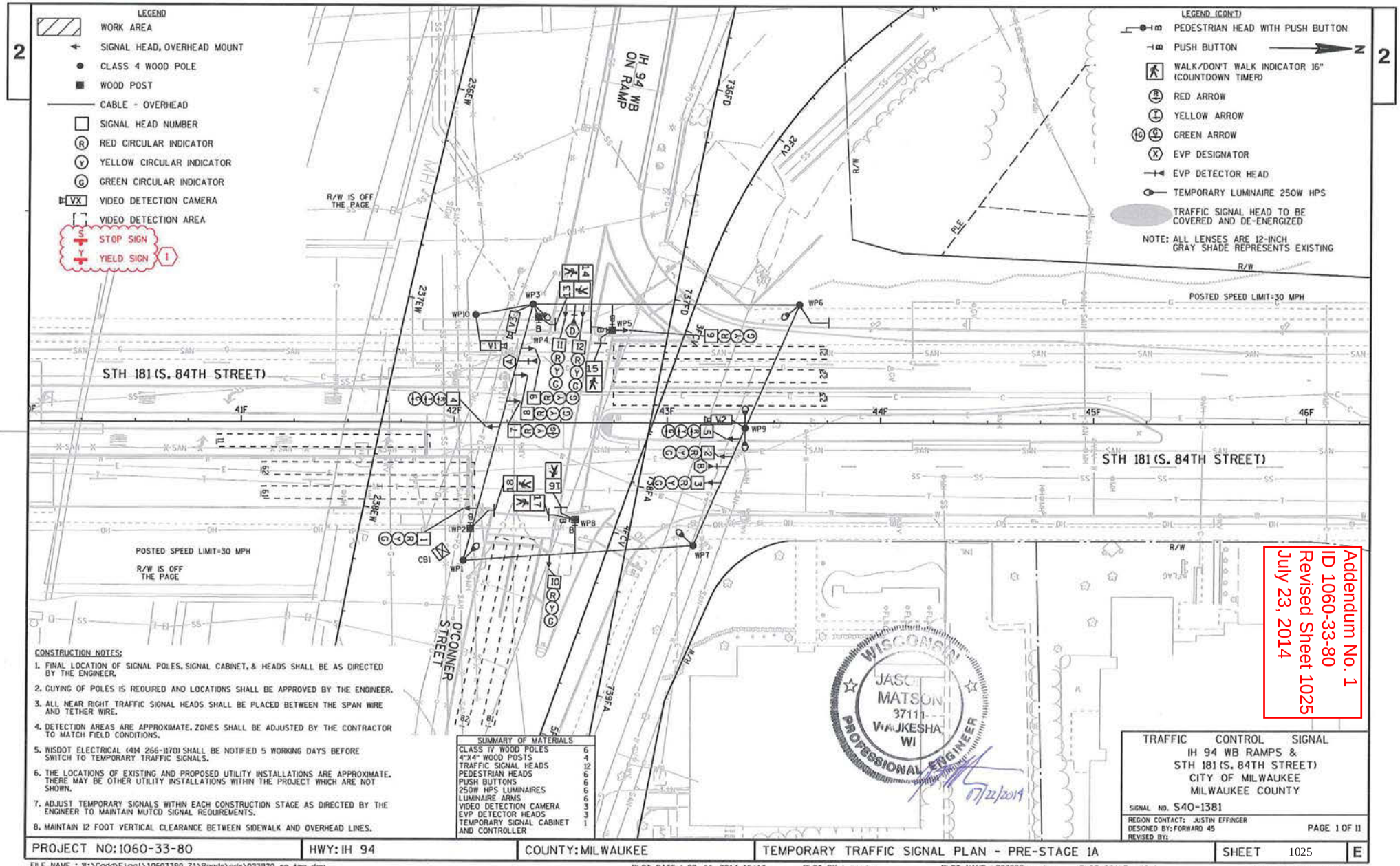
(B) REMOVE TEMPORARY TRAFFIC SIGNAL UPON 1060-33-80 PROJECT COMPLETION

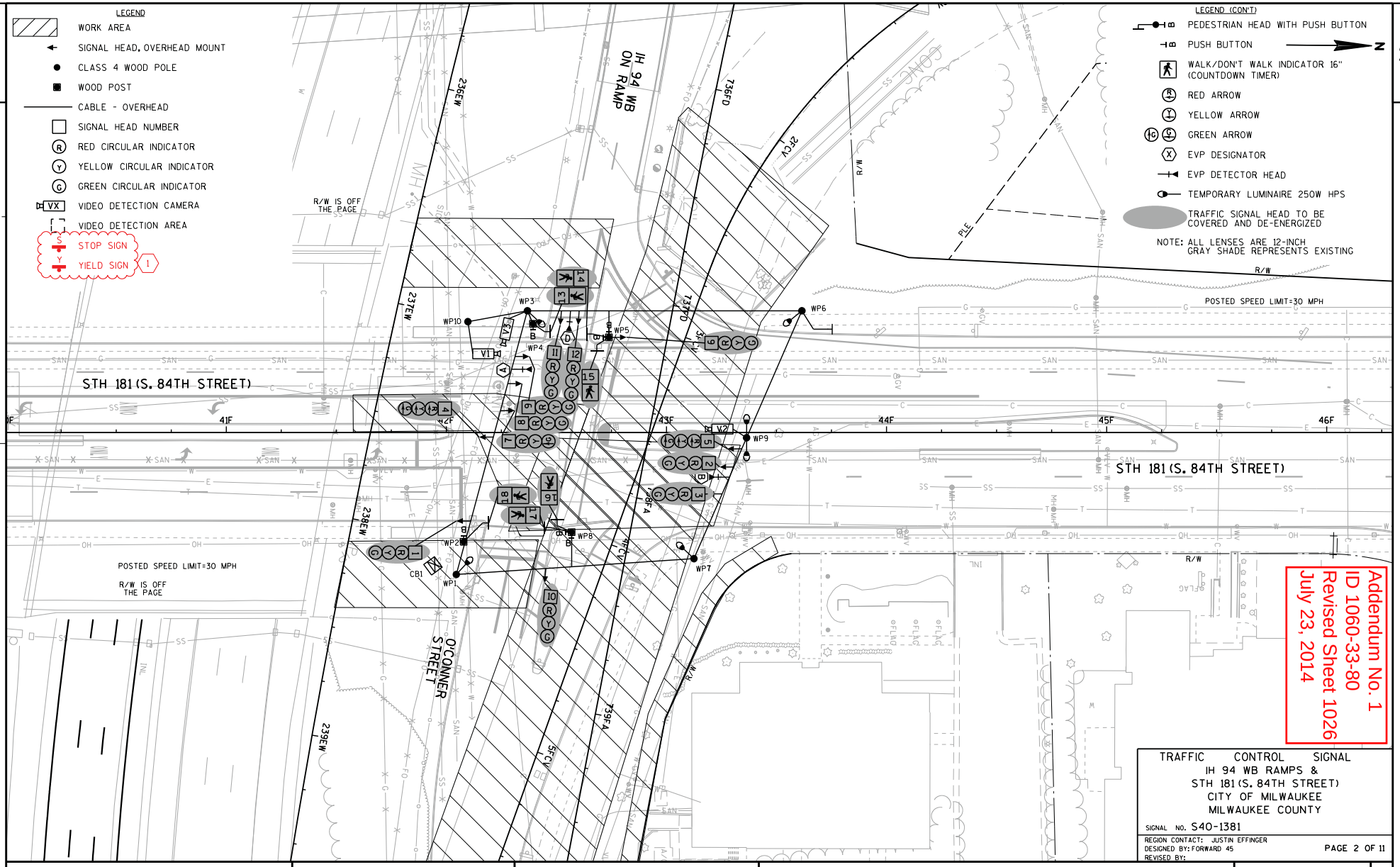
(C) INSTALL TEMPORARY TRAFFIC SIGNAL 1

Addendum No. 1
ID 1060-33-80
Revised Sheet 1013
July 23, 2014

PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY TRAFFIC SIGNAL PROJECT OVERVIEW	SHEET 1013	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023901_sp_tmp_po.dgn PLOT DATE : 22-JUL-2014 15:04 PLOT BY : mscjym PLOT NAME : PLOT SCALE : 375:1

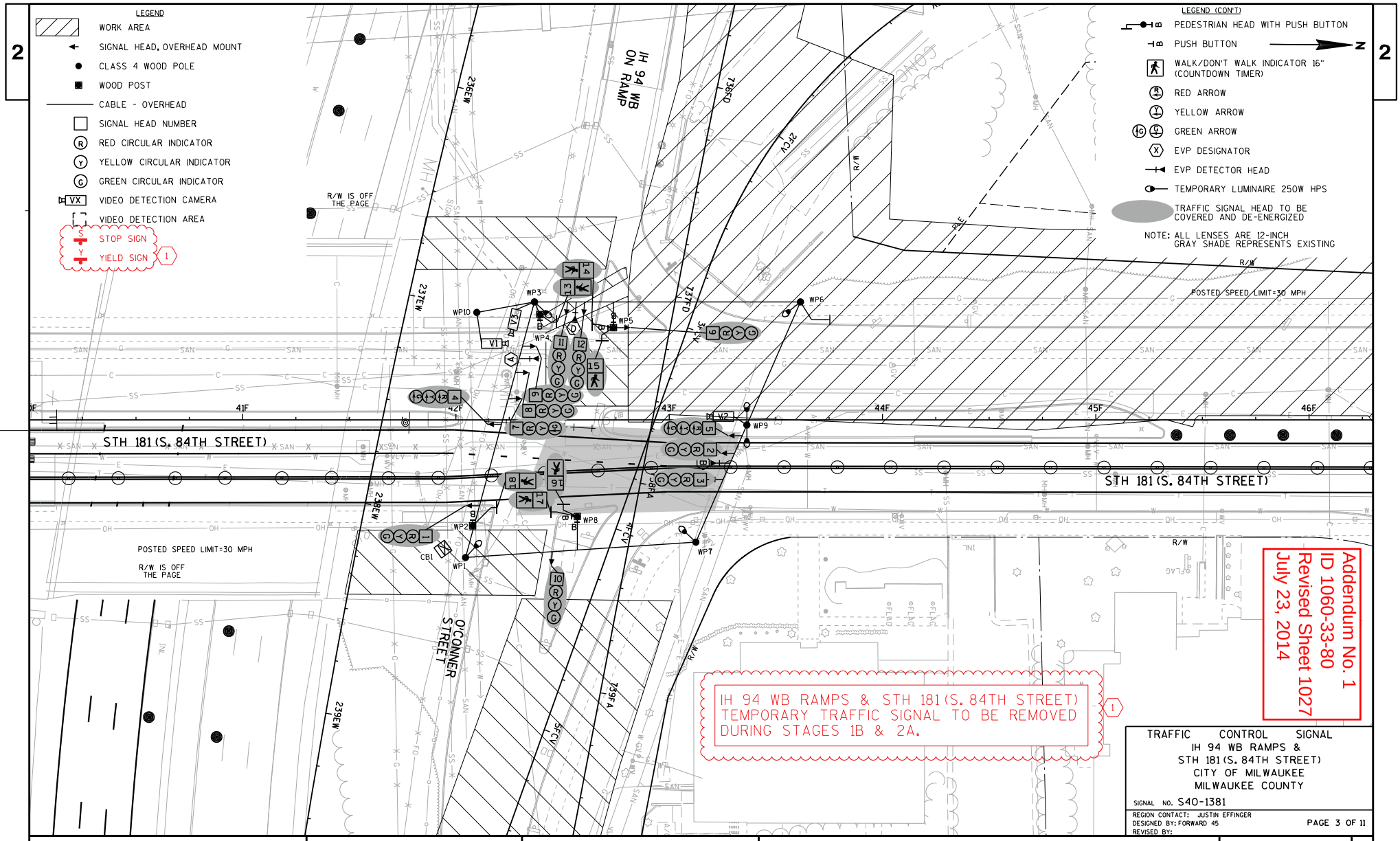

LEGEND
WORK AREA
SIGNAL HEAD, OVERHEAD MOUNT
CLASS 4 WOOD POLE
WOOD POST
CABLE - OVERHEAD
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
VIDEO DETECTION CAMERA
VIDEO DETECTION AREA
STOP SIGN
YIELD SIGN
LEGEND (CONT)
PEDESTRIAN HEAD WITH PUSH BUTTON
PUSH BUTTON
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
TEMPORARY LUMINAIRE 250W HPS
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
NOTE: ALL LENSES ARE 12-INCH GRAY SHADE REPRESENTS EXISTING
IH 94 WB ON RAMP
STH 181 (S. 84TH STREET)
R/W IS OFF THE PAGE
POSTED SPEED LIMIT=30 MPH
O'CONNER STREET
WP1
WP2
WP3
WP4
WP5
WP6
WP7
WP8
WP9
WP10
CB1
V1
V2
CONSTRUCTION NOTES:
1. FINAL LOCATION OF SIGNAL POLES, SIGNAL CABINET, & HEADS SHALL BE AS DIRECTED BY THE ENGINEER.
2. GUYING OF POLES IS REQUIRED AND LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
3. ALL NEAR RIGHT TRAFFIC SIGNAL HEADS SHALL BE PLACED BETWEEN THE SPAN WIRE AND TETHER WIRE.
4. DETECTION AREAS ARE APPROXIMATE. ZONES SHALL BE ADJUSTED BY THE CONTRACTOR TO MATCH FIELD CONDITIONS.
5. WISDOT ELECTRICAL (414 266-1170) SHALL BE NOTIFIED 5 WORKING DAYS BEFORE SWITCH TO TEMPORARY TRAFFIC SIGNALS.
6. THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT WHICH ARE NOT SHOWN.
7. ADJUST TEMPORARY SIGNALS WITHIN EACH CONSTRUCTION STAGE AS DIRECTED BY THE ENGINEER TO MAINTAIN MUTCD SIGNAL REQUIREMENTS.
8. MAINTAIN 12 FOOT VERTICAL CLEARANCE BETWEEN SIDEWALK AND OVERHEAD LINES.
SUMMARY OF MATERIALS
CLASS IV WOOD POLES 6
4"X4" WOOD POSTS 4
TRAFFIC SIGNAL HEADS 12
PEDESTRIAN HEADS 6
PUSH BUTTONS 6
250W HPS LUMINAIRES 6
LUMINAIRE ARMS 6
VIDEO DETECTION CAMERA 3
EVP DETECTOR HEADS 3
TEMPORARY SIGNAL CABINET AND CONTROLLER 1
JASON MATSON 37111 WAUKESHA WI PROFESSIONAL ENGINEER WISCONSIN
07/22/2014
Addendum No. 1
ID 1060-33-80
Revised Sheet 1025
July 23, 2014
TRAFFIC CONTROL SIGNAL
IH 94 WB RAMPS &
STH 181 (S. 84TH STREET)
CITY OF MILWAUKEE
MILWAUKEE COUNTY
SIGNAL NO. S40-1381
REGION CONTACT: JUSTIN EFFINGER
DESIGNED BY: FORWARD 45
REVISED BY:
PAGE 1 OF 11
PROJECT NO: 1060-33-80
HWY: IH 94
COUNTY: MILWAUKEE
TEMPORARY TRAFFIC SIGNAL PLAN - PRE-STAGE 1A
SHEET 1025 E
FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023920_sp_tmp.dgn
PLOT DATE : 22-JUL-2014 15:13
PLOT BY : mscjym
PLOT NAME : 023920_sp_tmp
PLOT SCALE : 40:1
WISDOT/CADDS SHEET 42

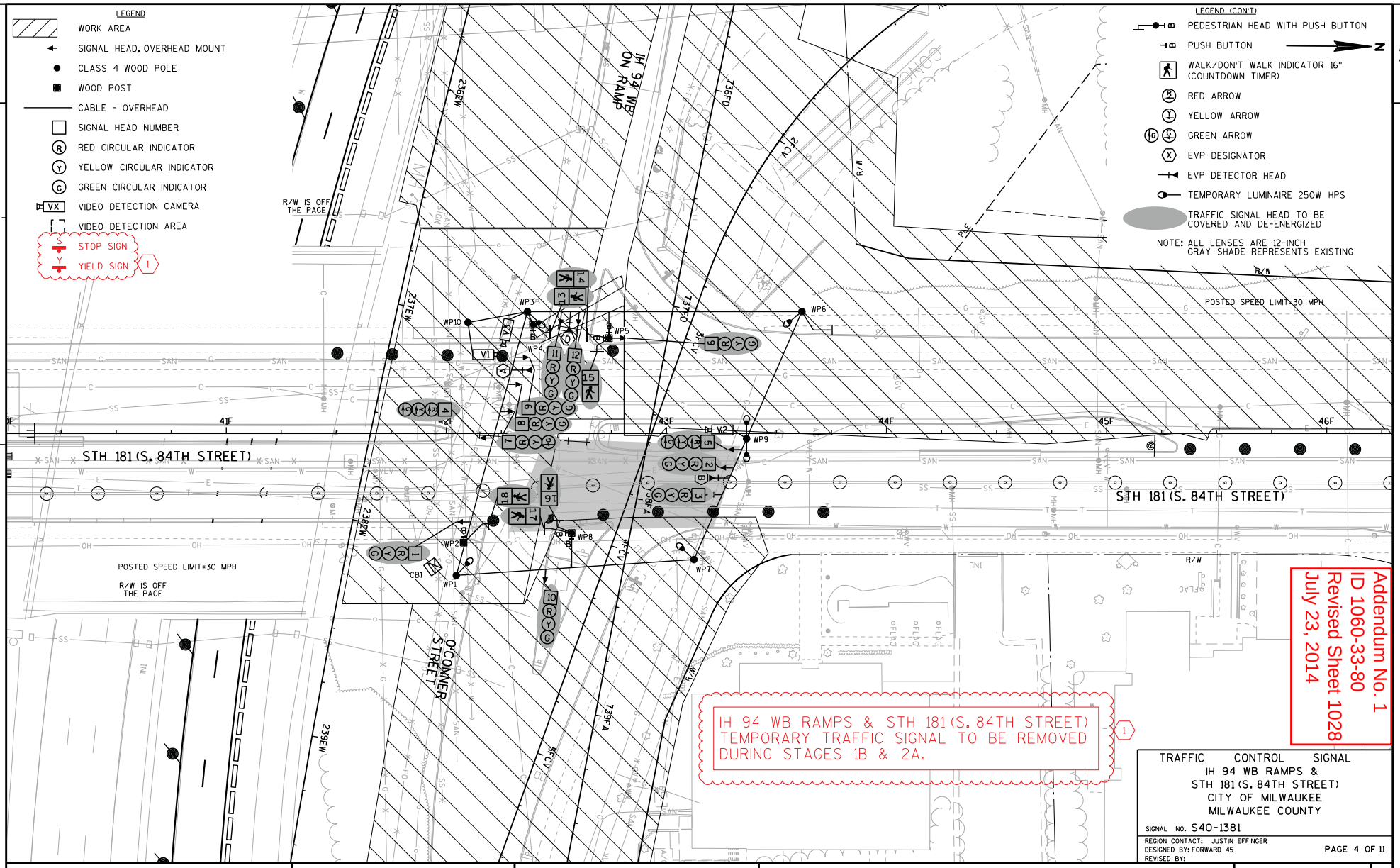


PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 1A	SHEET 1026	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023921a_sp_tmp.dgn PLOT DATE : 22-JUL-2014 15:13 PLOT BY : mscjym PLOT NAME : 023921a_sp_tmp PLOT SCALE : 40:1

WISDOT/CADDS SHEET 42

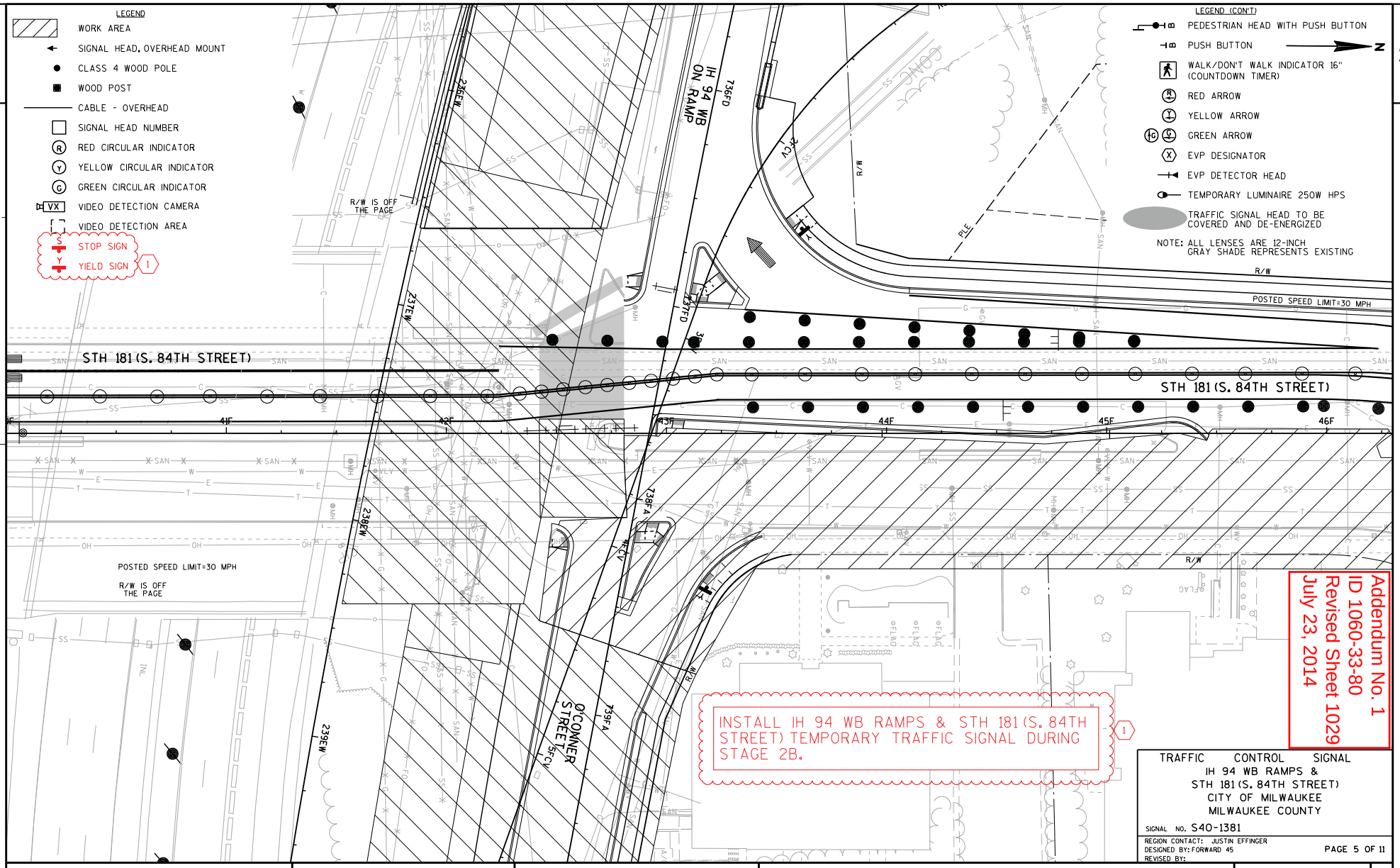

LEGEND
WORK AREA
SIGNAL HEAD, OVERHEAD MOUNT
CLASS 4 WOOD POLE
WOOD POST
CABLE - OVERHEAD
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
VIDEO DETECTION CAMERA
VIDEO DETECTION AREA
STOP SIGN
YIELD SIGN
LEGEND (CON'T)
PEDESTRIAN HEAD WITH PUSH BUTTON
PUSH BUTTON
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
TEMPORARY LUMINAIRE 250W HPS
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
NOTE: ALL LENSES ARE 12-INCH GRAY SHADE REPRESENTS EXISTING
IH 94 WB ON RAMP
STH 181 (S. 84TH STREET)
O'CONNER STREET
POSTED SPEED LIMIT=30 MPH
R/W IS OFF THE PAGE
IH 94 WB RAMPS & STH 181 (S. 84TH STREET)
TEMPORARY TRAFFIC SIGNAL TO BE REMOVED
DURING STAGES 1B & 2A.
Addendum No. 1
ID 1060-33-80
Revised Sheet 1027
July 23, 2014
TRAFFIC CONTROL SIGNAL
IH 94 WB RAMPS &
STH 181 (S. 84TH STREET)
CITY OF MILWAUKEE
MILWAUKEE COUNTY
SIGNAL NO. S40-1381
REGION CONTACT: JUSTIN EFFINGER
DESIGNED BY: FORWARD 45
REVISED BY:
PAGE 3 OF 11
PROJECT NO: 1060-33-80
HWY: IH 94
COUNTY: MILWAUKEE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 1B
SHEET 1027
E
FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023921b_sp_tmp.dgn
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PLOT BY : mscjym
PLOT NAME : 023921b_sp_tmp
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WISDOT/CADDS SHEET 42

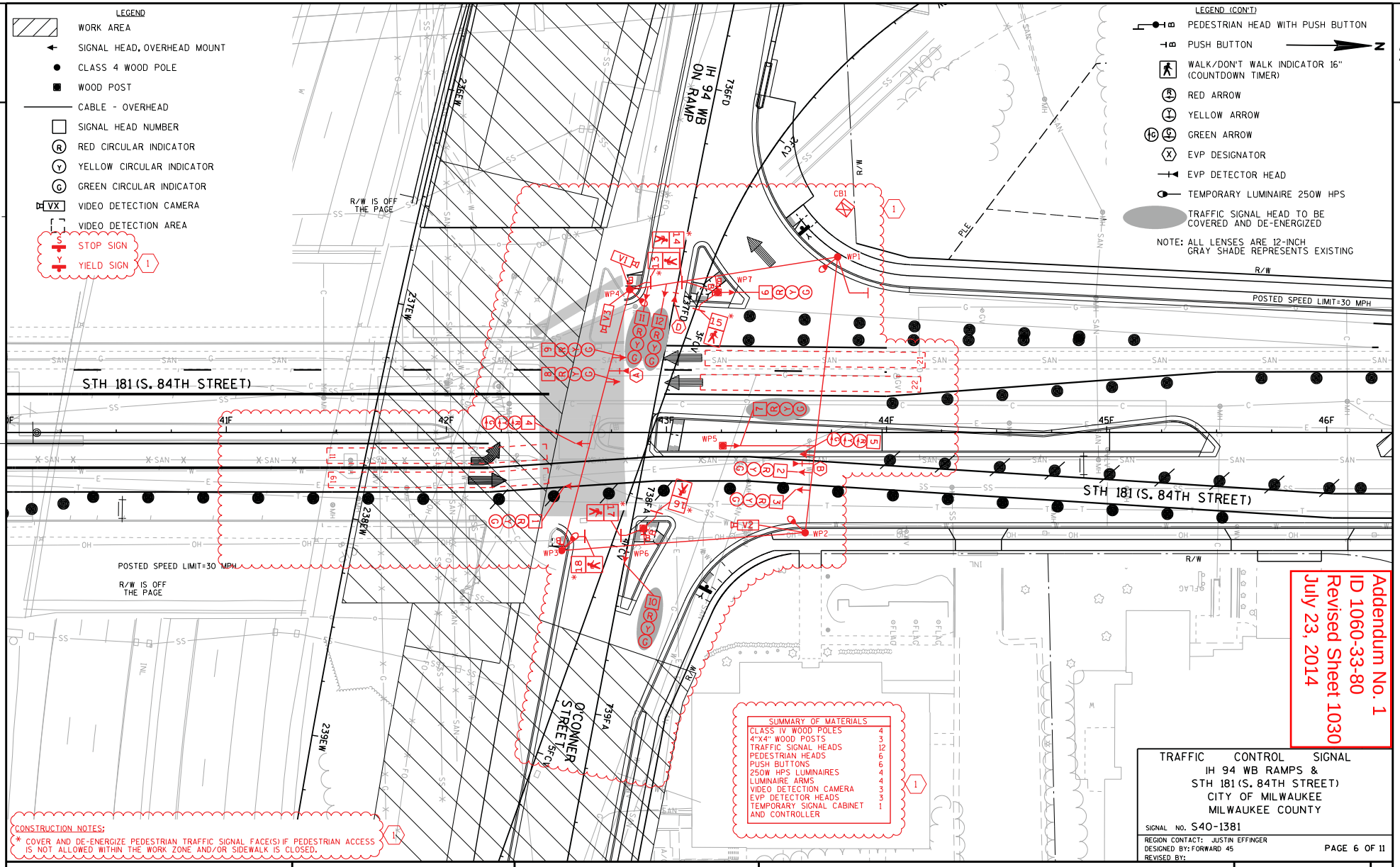


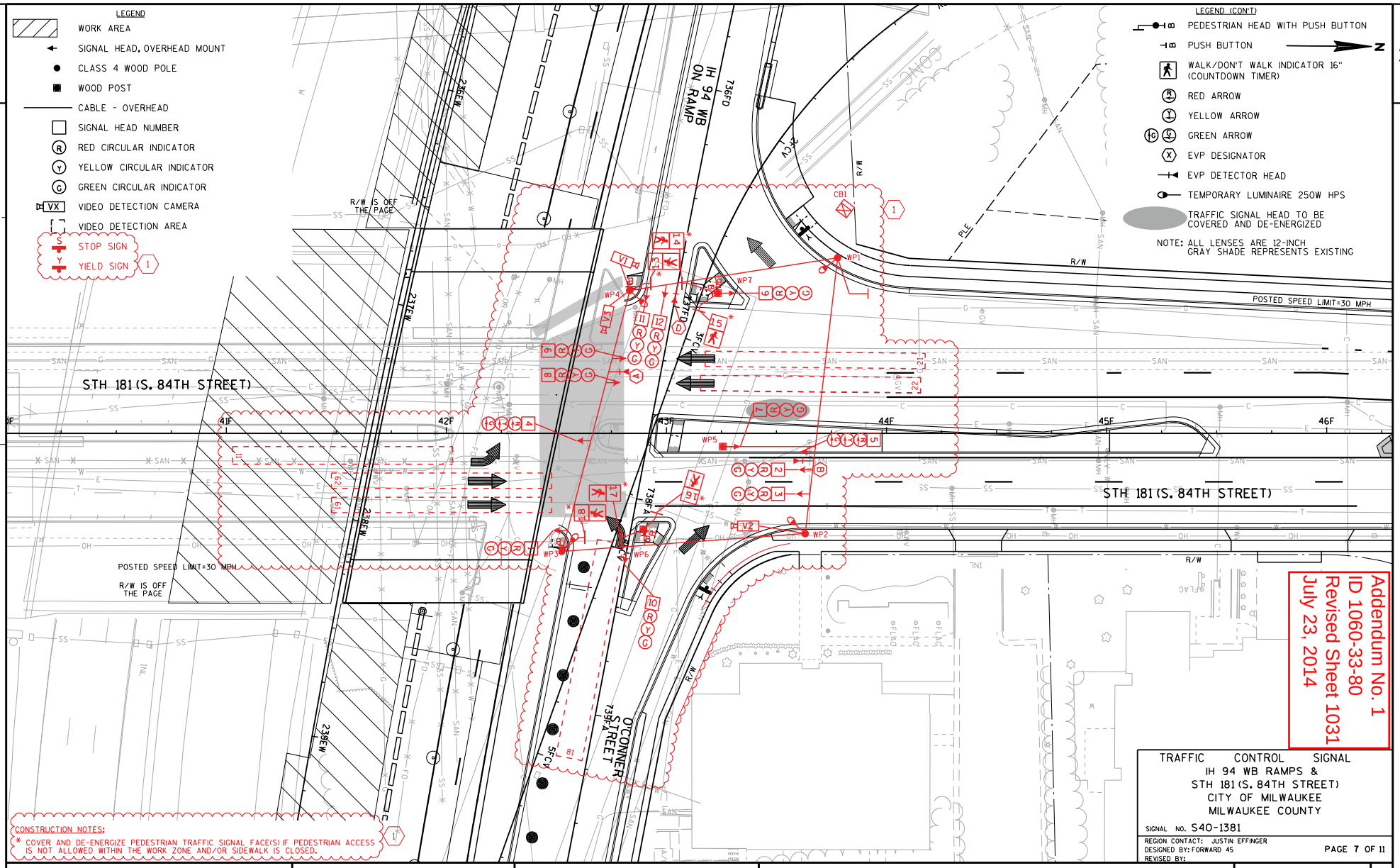
PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 2A	SHEET 1028	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023922a_sp_tmp.dgn PLOT DATE : 22-JUL-2014 15:13 PLOT BY : mscjym PLOT NAME : 023922a_sp_tmp PLOT SCALE : 40:1

WISDOT/CADDS SHEET 42


LEGEND
WORK AREA
SIGNAL HEAD, OVERHEAD MOUNT
CLASS 4 WOOD POLE
WOOD POST
CABLE - OVERHEAD
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
VIDEO DETECTION CAMERA
VIDEO DETECTION AREA
STOP SIGN
YIELD SIGN
LEGEND (CON'T)
PEDESTRIAN HEAD WITH PUSH BUTTON
PUSH BUTTON
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
TEMPORARY LUMINAIRE 250W HPS
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
NOTE: ALL LENSES ARE 12-INCH GRAY SHADE REPRESENTS EXISTING
N
IH 94 WB ON RAMP
STH 181 (S. 84TH STREET)
POSTED SPEED LIMIT=30 MPH
R/W IS OFF THE PAGE
R/W
O'CONNER STREET
INSTALL IH 94 WB RAMPS & STH 181 (S. 84TH STREET) TEMPORARY TRAFFIC SIGNAL DURING STAGE 2B.
Addendum No. 1
ID 1060-33-80
Revised Sheet 1029
July 23, 2014
TRAFFIC CONTROL SIGNAL
IH 94 WB RAMPS &
STH 181 (S. 84TH STREET)
CITY OF MILWAUKEE
MILWAUKEE COUNTY
SIGNAL NO. S40-1381
REGION CONTACT: JUSTIN EFFINGER
DESIGNED BY: FORWARD 45
REVISED BY:
PAGE 5 OF 11
PROJECT NO: 1060-33-80
HWY: IH 94
COUNTY: MILWAUKEE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 2B
SHEET 1029
E
FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023922b_sp_tmp.dgn
PLOT DATE : 22-JUL-2014 15:13
PLOT BY : mscjym
PLOT NAME : 023922b_sp_tmp
PLOT SCALE : 40:1
WISDOT/CADDS SHEET 42


LEGEND
WORK AREA
SIGNAL HEAD, OVERHEAD MOUNT
CLASS 4 WOOD POLE
WOOD POST
CABLE - OVERHEAD
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
VIDEO DETECTION CAMERA
VIDEO DETECTION AREA
STOP SIGN
YIELD SIGN
LEGEND (CON'T)
PEDESTRIAN HEAD WITH PUSH BUTTON
PUSH BUTTON
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
TEMPORARY LUMINAIRE 250W HPS
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
NOTE: ALL LENSES ARE 12-INCH GRAY SHADE REPRESENTS EXISTING
IH 94 WB ON RAMP
STH 181 (S. 84TH STREET)
O'CONNER STREET
R/W IS OFF THE PAGE
POSTED SPEED LIMIT=30 MPH
R/W
SUMMARY OF MATERIALS
CLASS IV WOOD POLES 4
4"X4" WOOD POSTS 3
TRAFFIC SIGNAL HEADS 12
PEDESTRIAN HEADS 6
PUSH BUTTONS 6
250W HPS LUMINAIRES 4
LUMINAIRE ARMS 4
VIDEO DETECTION CAMERA 3
EVP DETECTOR HEADS 3
TEMPORARY SIGNAL CABINET AND CONTROLLER 1
CONSTRUCTION NOTES:
* COVER AND DE-ENERGIZE PEDESTRIAN TRAFFIC SIGNAL FACE(S) IF PEDESTRIAN ACCESS IS NOT ALLOWED WITHIN THE WORK ZONE AND/OR SIDEWALK IS CLOSED.
Addendum No. 1
ID 1060-33-80
Revised Sheet 1030
July 23, 2014
TRAFFIC CONTROL SIGNAL
IH 94 WB RAMPS &
STH 181 (S. 84TH STREET)
CITY OF MILWAUKEE
MILWAUKEE COUNTY
SIGNAL NO. S40-1381
REGION CONTACT: JUSTIN EFFINGER
DESIGNED BY: FORWARD 45
REVISED BY:
PAGE 6 OF 11
PROJECT NO: 1060-33-80
HWY: IH 94
COUNTY: MILWAUKEE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 2C
SHEET 1030
E
FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023922c_sp_tmp.dgn
PLOT DATE : 22-JUL-2014 15:13
PLOT BY : mscjym
PLOT NAME : 023922c_sp_tmp
PLOT SCALE : 40:1
WISDOT/CADDS SHEET 42



Addendum No. 1
ID 1060-33-80
Revised Sheet 1031
July 23, 2014

TRAFFIC CONTROL SIGNAL
IH 94 WB RAMPS &
STH 181 (S. 84TH STREET)
CITY OF MILWAUKEE
MILWAUKEE COUNTY

SIGNAL NO. S40-1381

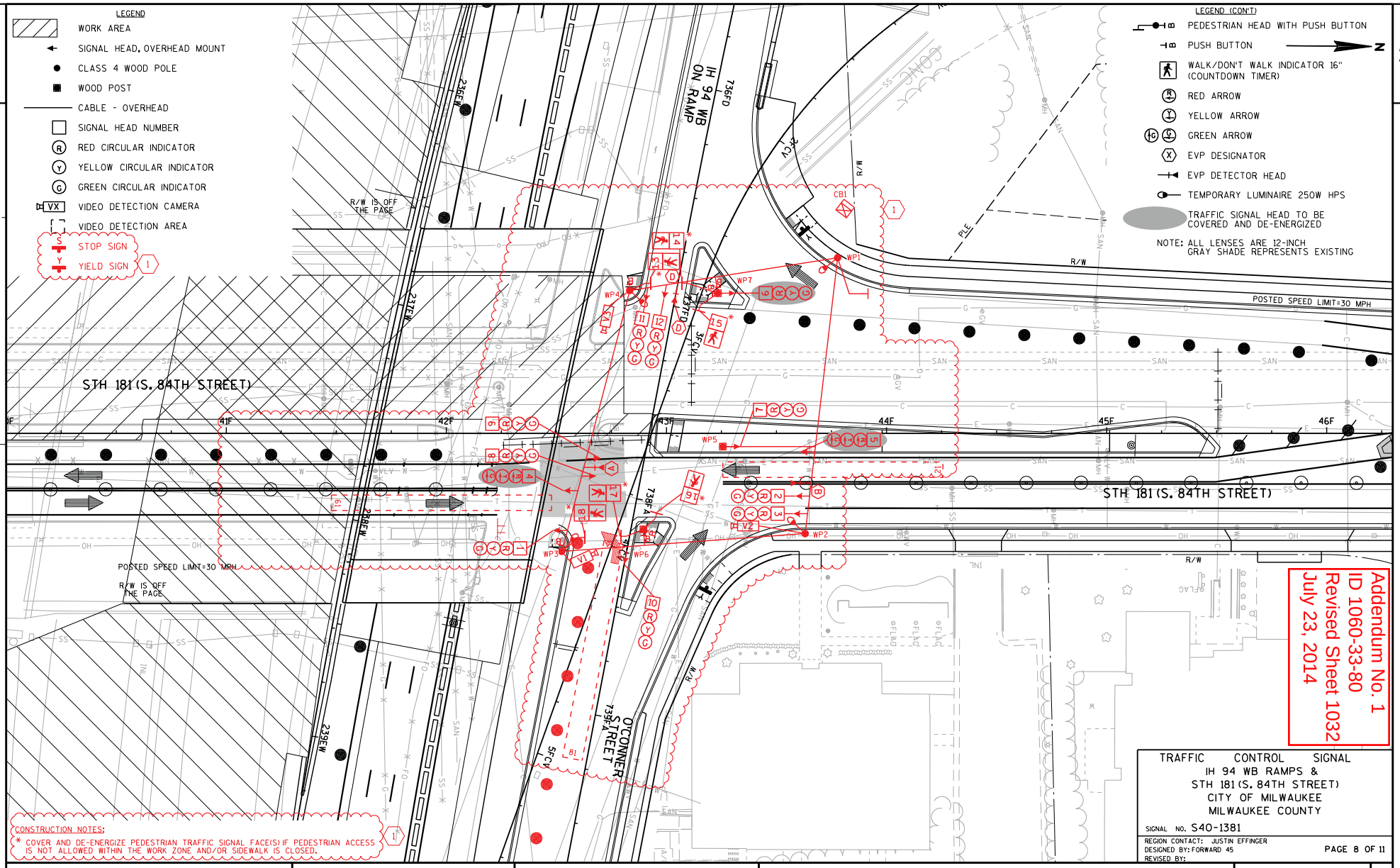
REGION CONTACT: JUSTIN EFFINGER
DESIGNED BY: FORWARD 45
REVISED BY:

PAGE 7 OF 11

PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 3	SHEET 1031	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023923_sp_tmp.dgn
PLOT DATE : 22-JUL-2014 15:13
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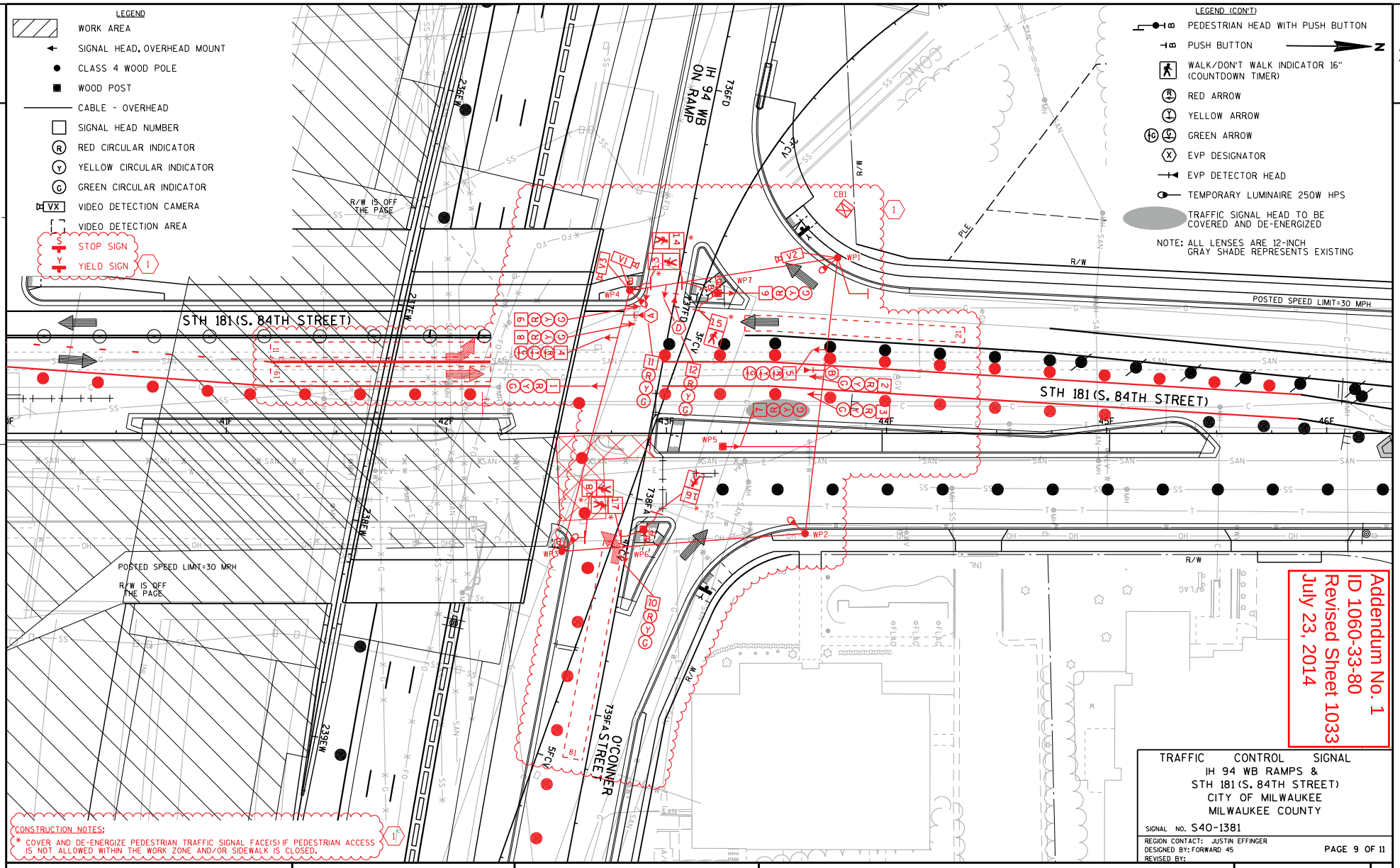
WISDOT/CADDS SHEET 42



PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 4A	SHEET 1032	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023924a_sp_tmp.dgn PLOT DATE : 22-JUL-2014 15:14 PLOT BY : mscjym PLOT NAME : 023924a_sp_tmp PLOT SCALE : 40:1

WISDOT/CADDS SHEET 42

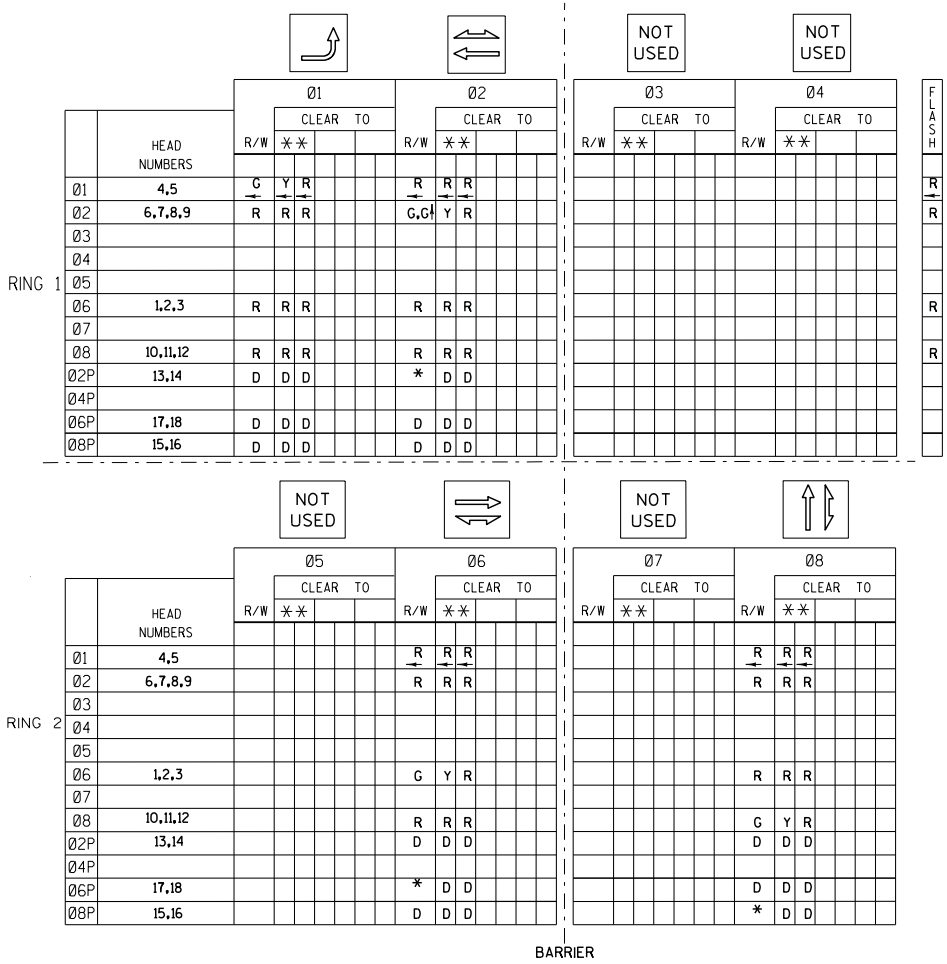


PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 4B	SHEET 1033	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023924b_sp_tmp.dgn PLOT DATE : 22-JUL-2014 15:14 PLOT BY : mscjym PLOT NAME : 023924b_sp_tmp PLOT SCALE : 40:1

WISDOT/CADDS SHEET 42

SEQUENCE OF OPERATION



** CLEARANCE TO A PHASE IN CONFLICT WITH THIS PHASE ON (SEE CHART 1)

* WHEN CALLED, TIMED STEADY WALK, THEN FLASHING DON'T WALK, THEN GOES TO STEADY DON'T WALK

DETECTOR LOGIC

DETECTOR NUMBER	DETECTOR INPUT	DETECTOR OPERATION: CALLS AND EXTENDS	DETECTOR OPERATION: CALLS ONLY	DETECTOR OPERATION: EXTENDS ONLY	PHASE CALLED	PHASE EXTENDED	DETECTOR DISCONNECT PHASE	CALLING DELAY	EXTENSION STRETCH	SIZE	NUMBER OF TURNS
11		X			1	1					VIDEO
21		X			2	2					VIDEO
22		X			2	2					VIDEO
23		X			2	2					VIDEO
61		X			6	6					VIDEO
62		X			6	6					VIDEO
81		X			8	8					VIDEO
82		X			8	8					VIDEO

CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / Ø	PHASE RECALL	PHASE ACTIVE
1		6		X
2		6	MIN.	X
3				
4				
5				
6		2	MIN.	X
7				
8				X

OVERLAPS

O.L. "A" =
O.L. "B" =
O.L. "C" =
O.L. "D" =

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N

TYPE OF INTERCONNECT COMMUNICATION	
NONE	
TBC	
CLOSED LOOP TWISTED PAIR*	
CLOSED LOOP FIBER OPTIC*	
FIBER OPTIC (ETHERNET)	
RADIO	x
*LOCATION OF MASTER CONTROLLER NO:	S-
SIGNAL SYSTEM #:	SS- -

1

TYPE OF PRE-EMPT	
NONE	
RAILROAD	
EMERGENCY VEHICLE	x
GTT	
TOMAR	
HARDWIRE	
OTHER	
LIFT BRIDGE	
QUEUE DETECTOR	

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC SIGNAL CABINET	x
IN SEPARATE DOT LIGHTING CABINET	

EMERGENCY VEHICLE PREEMPTION SEQUENCE

EMERGENCY VEHICLE PREEMPTOR	CHANNEL A	CHANNEL B	CHANNEL D
MOVEMENT	← →	↘	↑
PHASE	2+6	6+1	8

AFTER PREEMPTION SEQUENCE 2+6 OR 6+1, CONTROLLER SHALL RETURN TO PHASES 2+6.

AFTER PREEMPTION SEQUENCE 8, CONTROLLER SHALL RETURN TO PHASE 8.

CHART 1

PHASE ON	NONCONFLICTING PHASE ALLOWED TO TIME CONCURRENTLY	PHASES IN CONFLICT WITH PHASE ON
1	6	2,8
2	6	1,8
3		
4		
5		
6	1 OR 2	8
7		
8	NONE	1,2,6

GENERAL NOTES:

1. ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.
2. WHEN ONE PHASE IS ON ALONE, ANY NONCONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL. (SEE CHART 1.)

IH 94 WB RAMPS &
STH 181 (S. 84TH STREET)
CITY OF MILWAUKEE
MILWAUKEE COUNTY

SIGNAL NO. S40-1381

CONTROLLER TYPE: TEMP

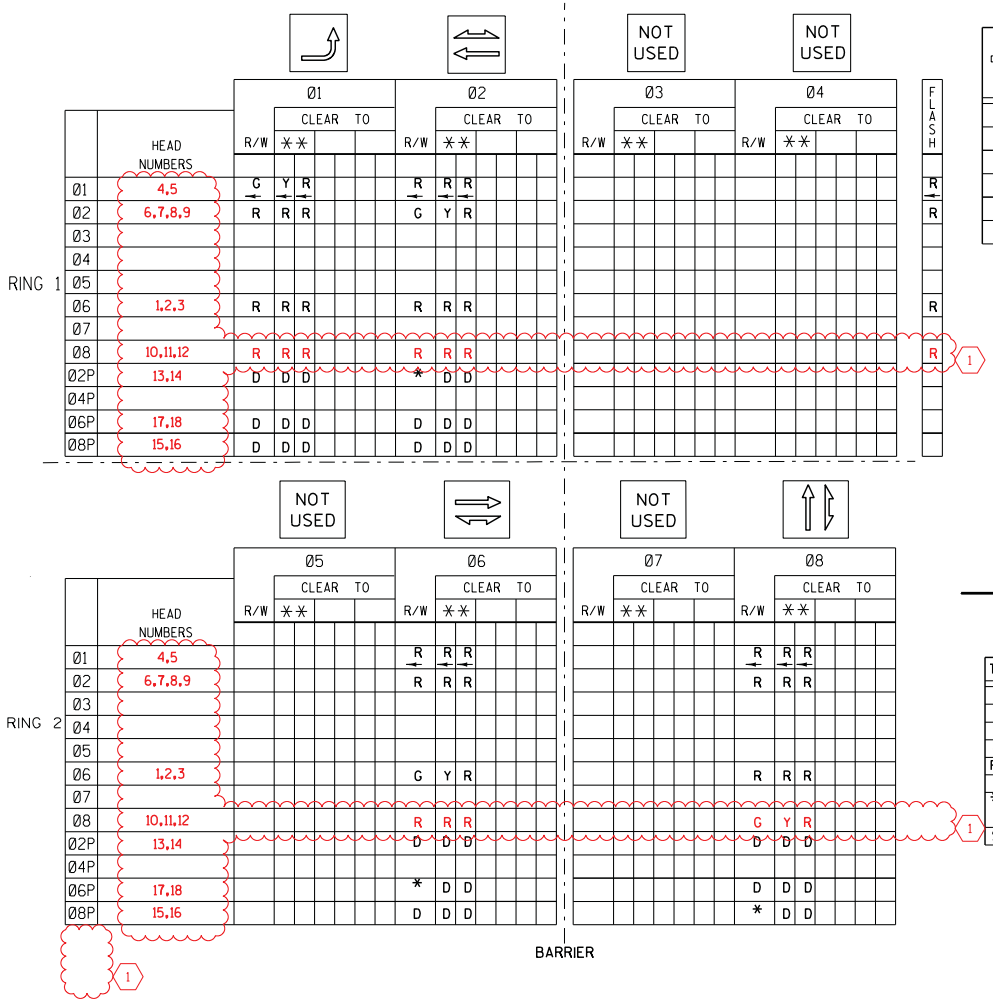
DATE 07/14 1

PAGE NO. 10 OF 11

PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY SEQUENCE OF OPERATIONS - PRE-STAGE 1A,1A,1B,2A,2B	SHEET 1034	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\023929a_sp_tmp_ph.dgn PLOT DATE : 22-JUL-2014 15:14 PLOT BY : mscjym PLOT NAME : 023929a_sp_tmp_ph PLOT SCALE : 40.003418:1

SEQUENCE OF OPERATION



** CLEARANCE TO A PHASE IN CONFLICT WITH THIS PHASE ON (SEE CHART 1)

* WHEN CALLED, TIMED STEADY WALK, THEN FLASHING DON'T WALK, THEN GOES TO STEADY DON'T WALK

DETECTOR LOGIC

DETECTOR NUMBER	DETECTOR INPUT	DETECTOR OPERATION: CALLS AND EXTENDS	DETECTOR OPERATION: CALLS ONLY	DETECTOR OPERATION: EXTENDS ONLY	PHASE CALLED	PHASE EXTENDED	DETECTOR DISCONNECT PHASE	CALLING DELAY	EXTENSION STRETCH	SIZE	NUMBER OF TURNS
11		X			1	1					VIDEO
21		X			2	2					VIDEO
22		X			2	2					VIDEO
61		X			6	6					VIDEO
62		X			6	6					VIDEO
81		X			8	8					VIDEO

CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / Ø	PHASE RECALL	PHASE ACTIVE
1		6		X
2		6	MIN.	X
3				
4				
5				
6		2	MIN.	X
7				
8				X

OVERLAPS

O.L. "A" =
O.L. "B" =
O.L. "C" =
O.L. "D" =

TYPE OF INTERCONNECT COMMUNICATION	
NONE	
TBC	
CLOSED LOOP TWISTED PAIR*	
CLOSED LOOP FIBER OPTIC*	
FIBER OPTIC (ETHERNET)	
RADIO	x
*LOCATION OF MASTER CONTROLLER NO:	S-
SIGNAL SYSTEM #:	SS- -

TYPE OF PRE-EMPT	
NONE	
RAILROAD	
EMERGENCY VEHICLE	x
GTT	
TOMAR	
HARDWIRE	
OTHER	
LIFT BRIDGE	
QUEUE DETECTOR	

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC SIGNAL CABINET	x
IN SEPARATE DOT LIGHTING CABINET	

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EMERGENCY VEHICLE PREEMPTION SEQUENCE

EMERGENCY VEHICLE PREEMPTOR	CHANNEL A	CHANNEL B	CHANNEL D
MOVEMENT	⇄	⇗	↑
PHASE	2+6	6+1	8

AFTER PREEMPTION SEQUENCE 2+6 OR 6+1, CONTROLLER SHALL RETURN TO PHASES 2+6.

AFTER PREEMPTION SEQUENCE 8, CONTROLLER SHALL RETURN TO PHASE 8.

CHART 1

PHASE ON	NONCONFLICTING PHASE ALLOWED TO TIME CONCURRENTLY	PHASES IN CONFLICT WITH PHASE ON
1	6	2,8
2	6	1,8
3		
4		
5		
6	1 OR 2	8
7		
8	NONE	1,2,6

GENERAL NOTES:

1. ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.
2. WHEN ONE PHASE IS ON ALONE, ANY NONCONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL. (SEE CHART 1.)

IH 94 WB RAMPS &
STH 181 (S. 84TH STREET)
CITY OF MILWAUKEE
MILWAUKEE COUNTY

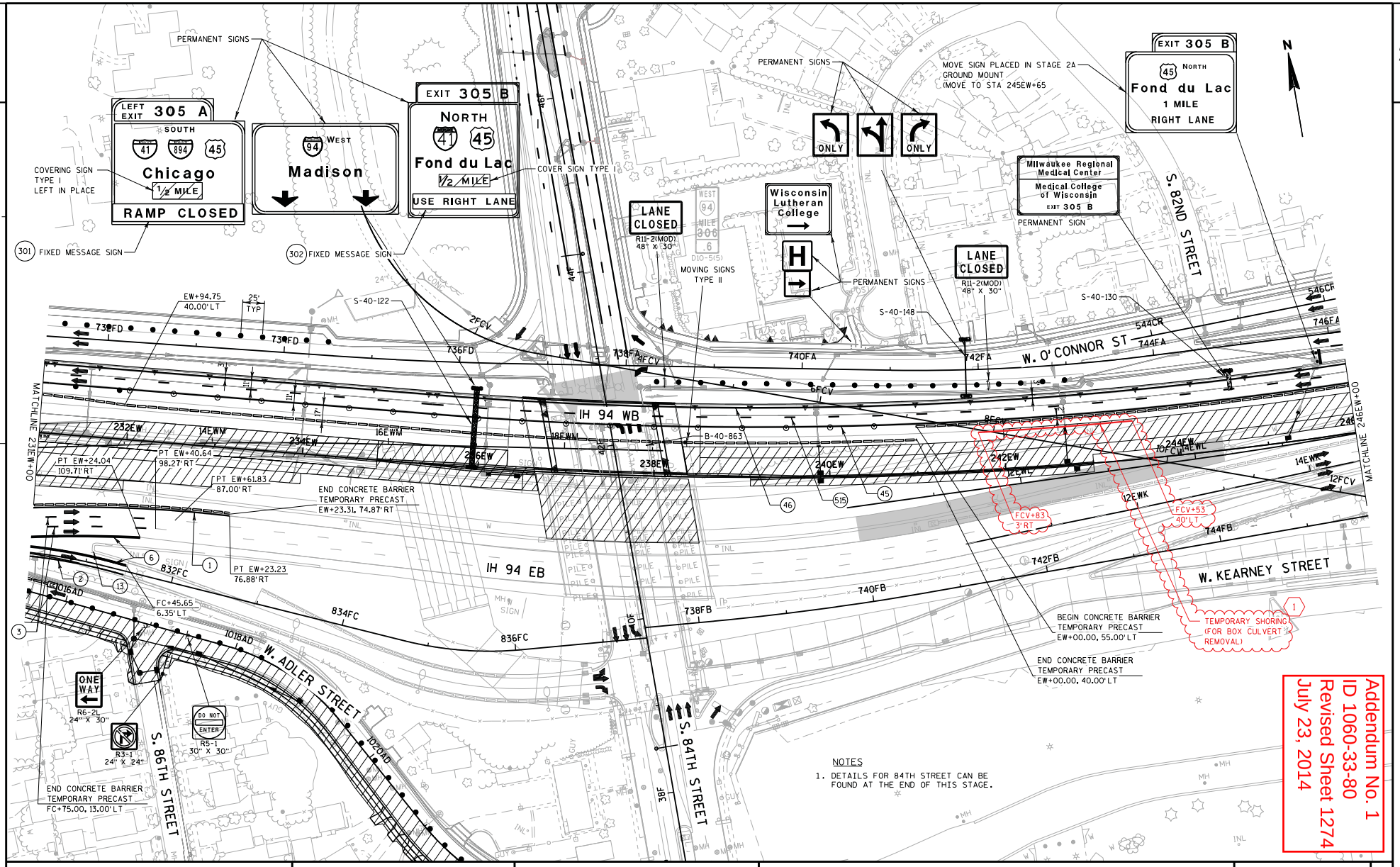
SIGNAL NO. S40-1381

CONTROLLER TYPE: TEMP

DATE 07/14 1

PAGE NO. 11 OF 11

PROJECT NO: 1060-33-80	HWY: IH 94	COUNTY: MILWAUKEE	TEMPORARY SEQUENCE OF OPERATIONS - 2C,3,4A,4B	SHEET 1035	E

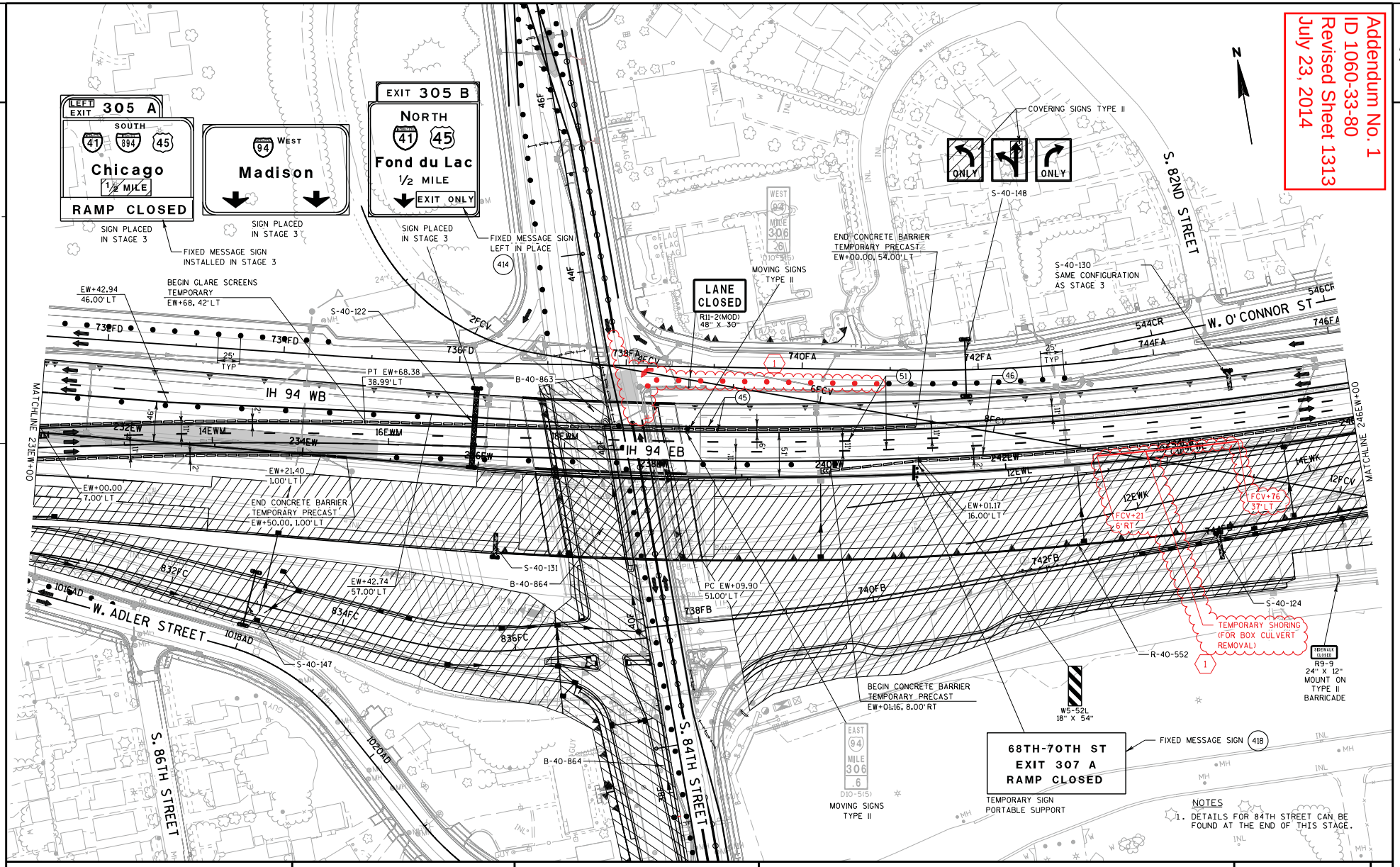


PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 3A CONSTRUCTION	SHEET 1274	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\026330_s3a.dgn PLOT DATE : 22-JUL-2014 14:26 PLOT BY : MSCDYB PLOT NAME : 026330_s3a PLOT SCALE : 100:1

WISDOT/CADDS SHEET 42

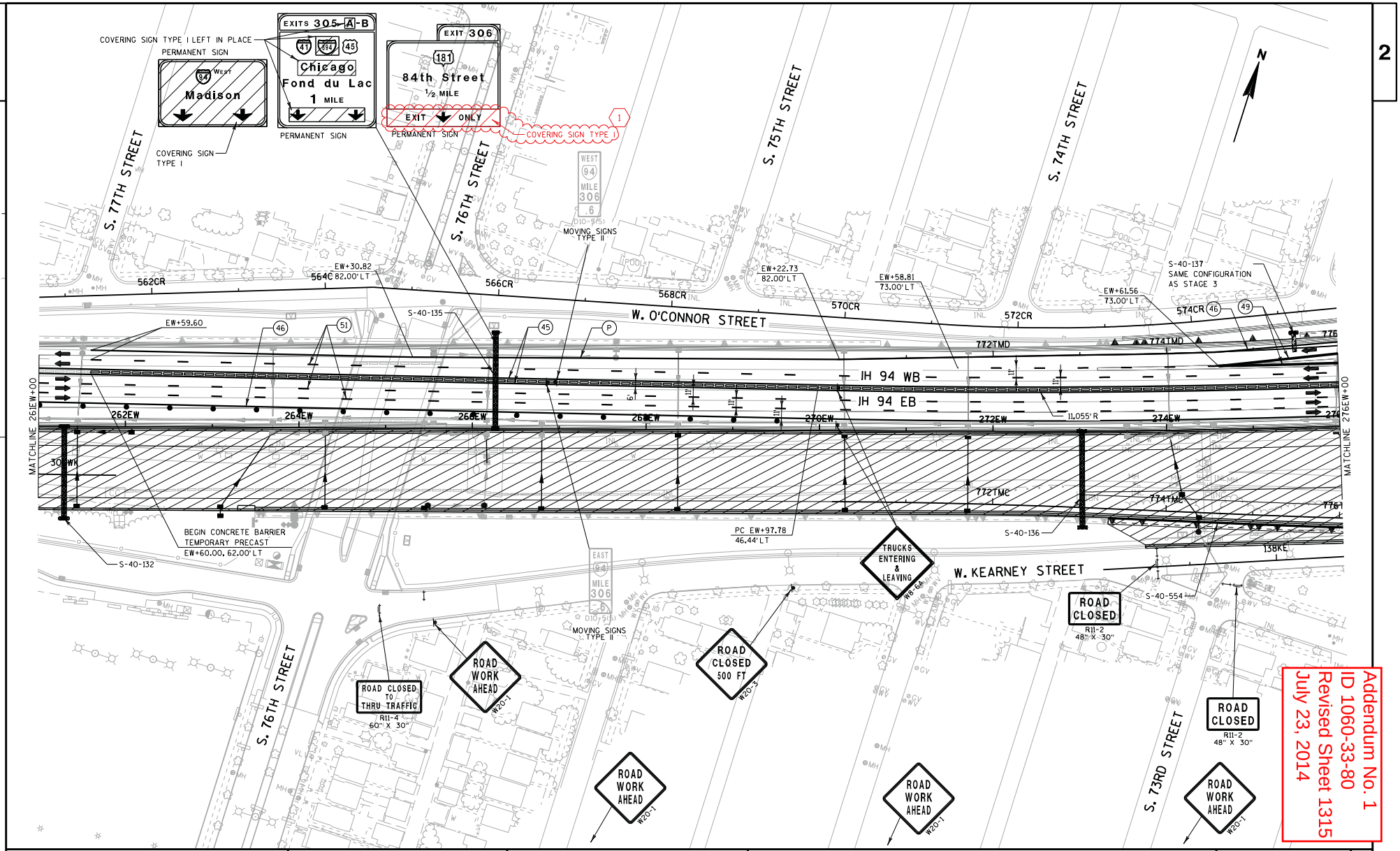
Addendum No. 1
ID 1060-33-80
Revised Sheet 1313
July 23, 2014



PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 4A CONSTRUCTION	SHEET 1313	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\026430_s4a.dgn PLOT DATE : 22-JUL-2014 14:26 PLOT BY : MSCDYB PLOT NAME : 026430_s4a PLOT SCALE : 100:1

WISDOT/CADDS SHEET 42

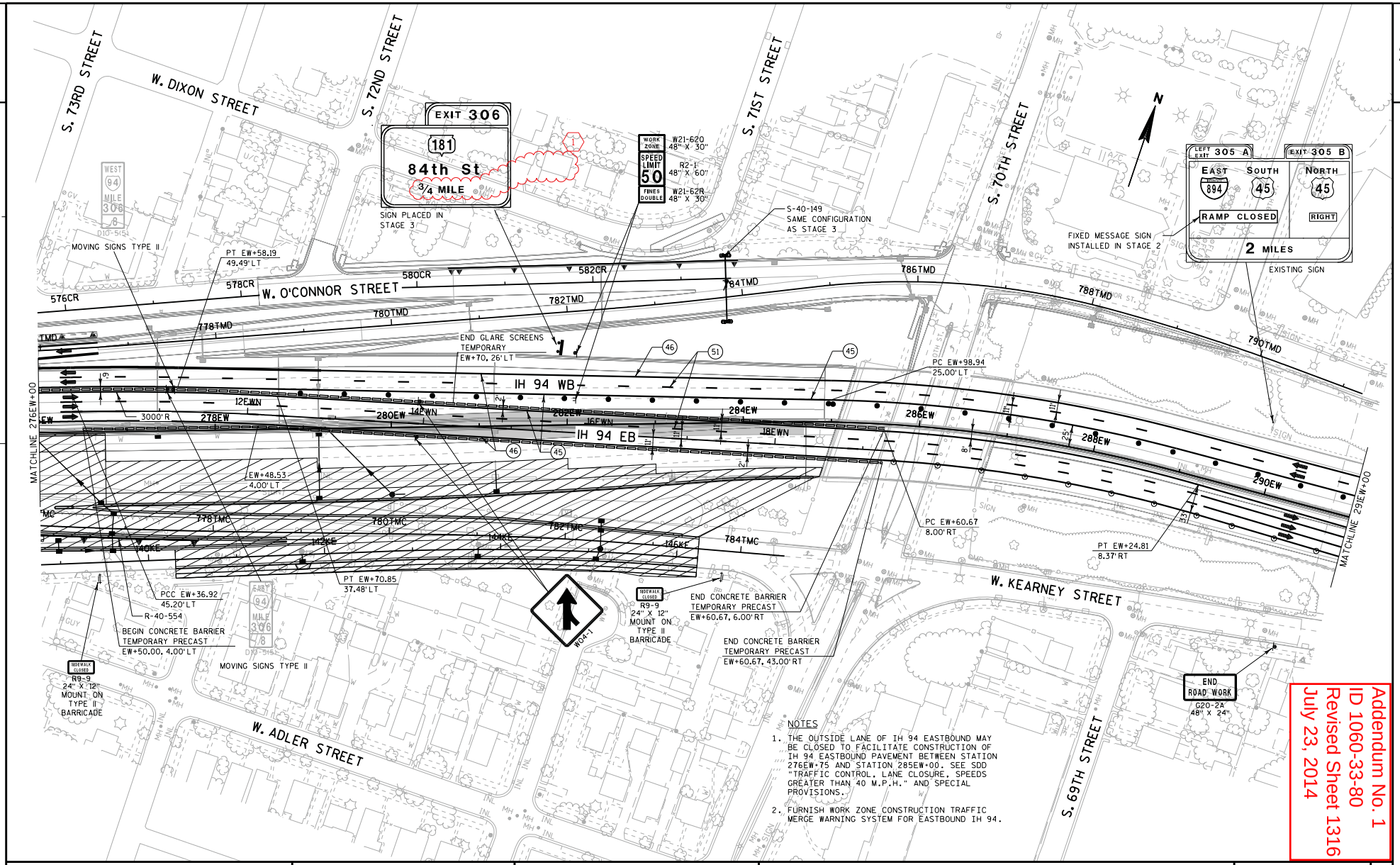


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ID 1060-33-80
Revised Sheet 1315
July 23, 2014

PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 4A CONSTRUCTION	SHEET 1315	E

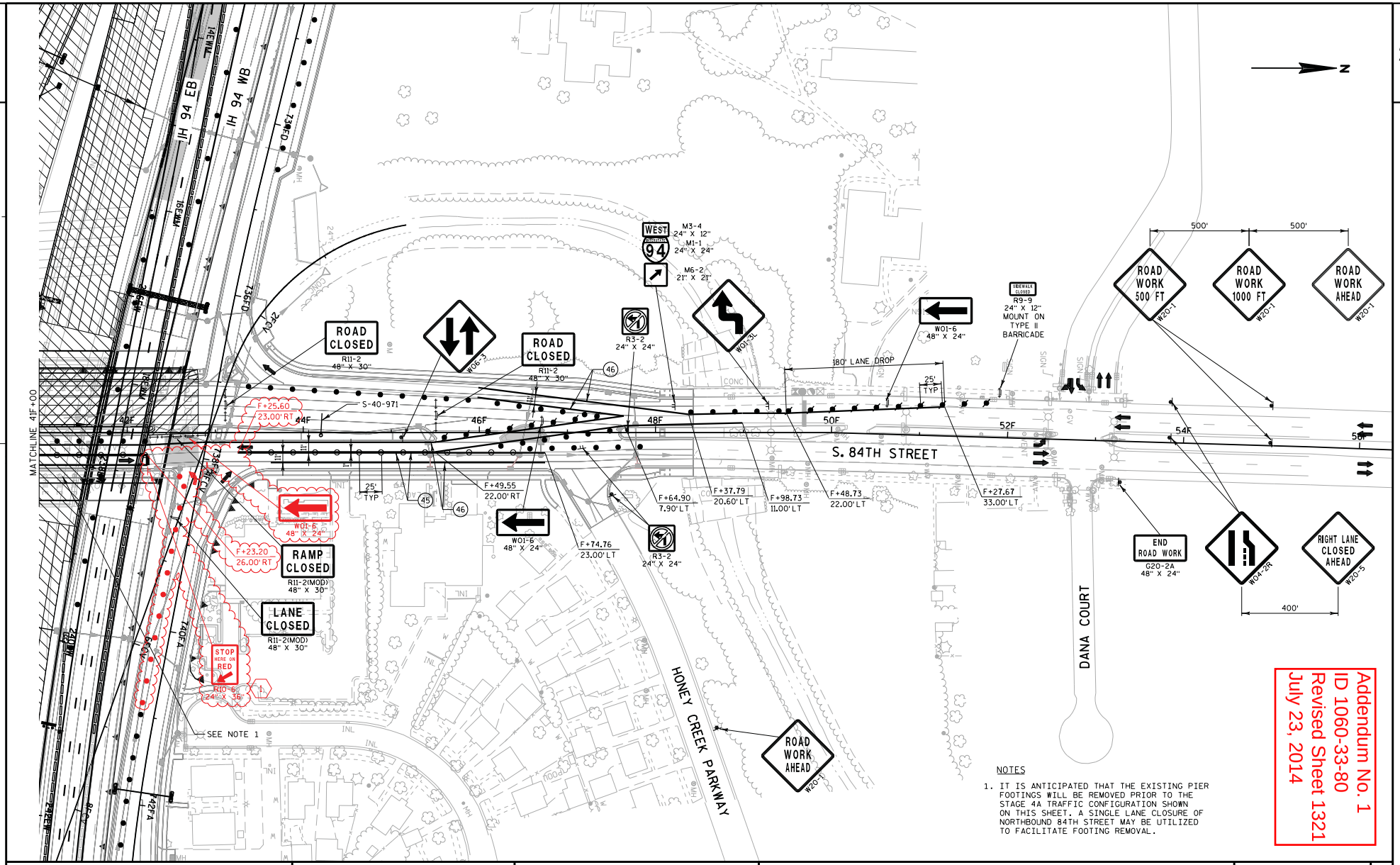
FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\026432_s4a.dgn PLOT DATE : 22-JUL-2014 14:27 PLOT BY : MSCDYB PLOT NAME : 026432_s4a PLOT SCALE : 100:1

WISDOT/CADDS SHEET 42



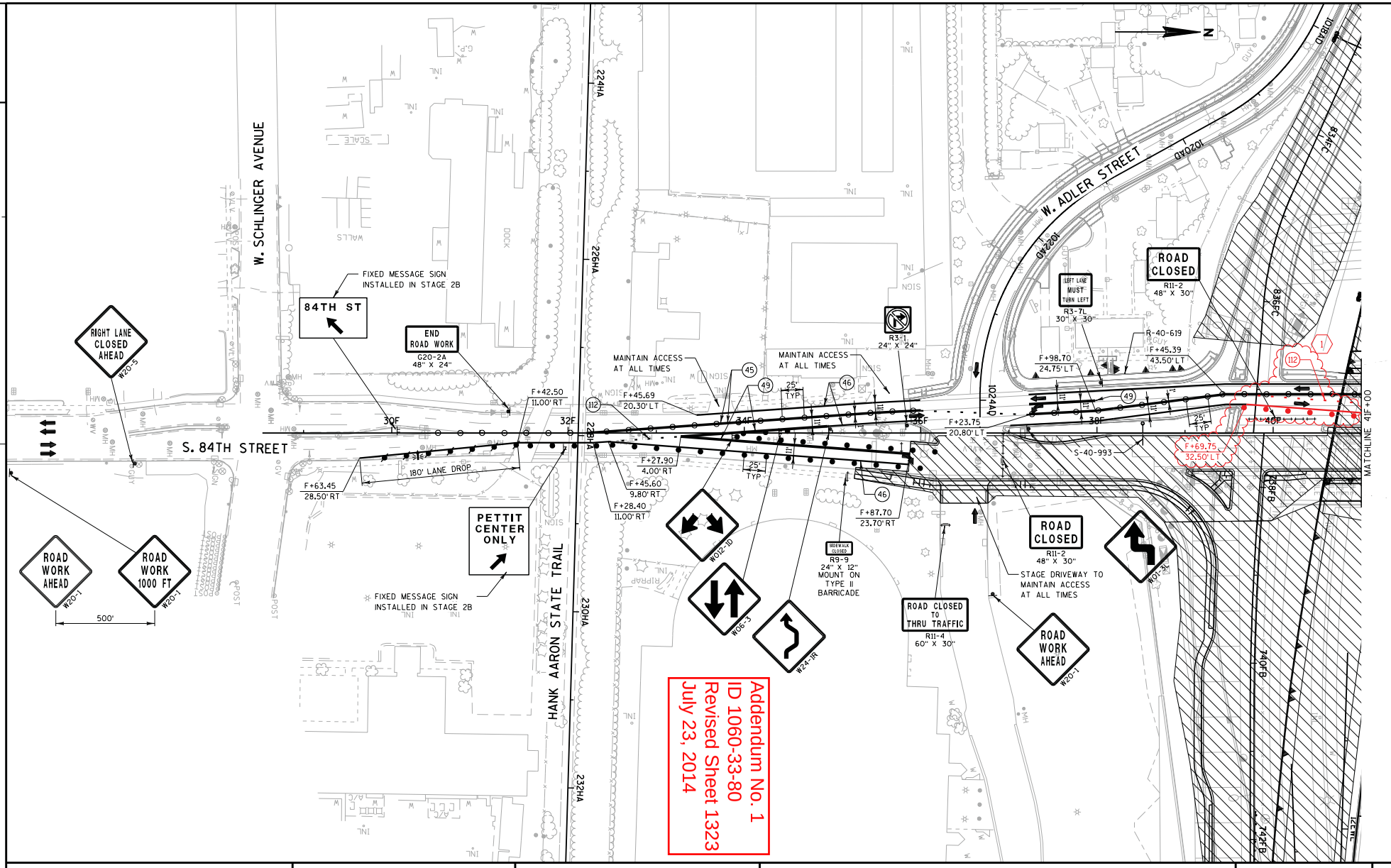
PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 4A CONSTRUCTION	SHEET 1316	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\026433_s4a.dgn PLOT DATE : 22-JUL-2014 14:27 PLOT BY : MSCDYB PLOT NAME : 026433_s4a PLOT SCALE : 100:1



PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 4A CONSTRUCTION	SHEET 1321	E

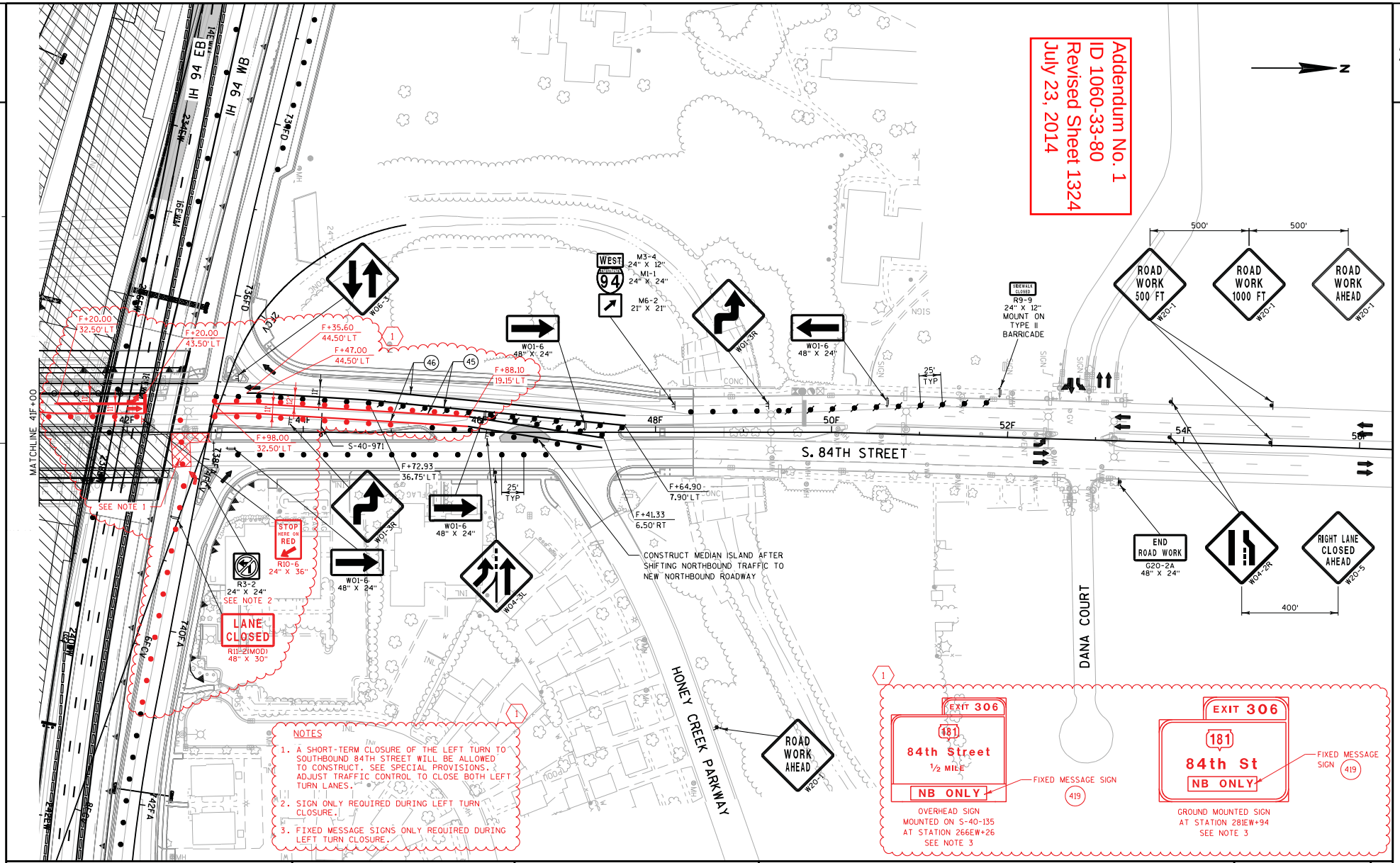
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PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 4B CONSTRUCTION	SHEET 1323	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\026496_s4b.dgn PLOT DATE : 22-JUL-2014 14:27 PLOT BY : MSCDYB PLOT NAME : 026496_s4b PLOT SCALE : 100:1

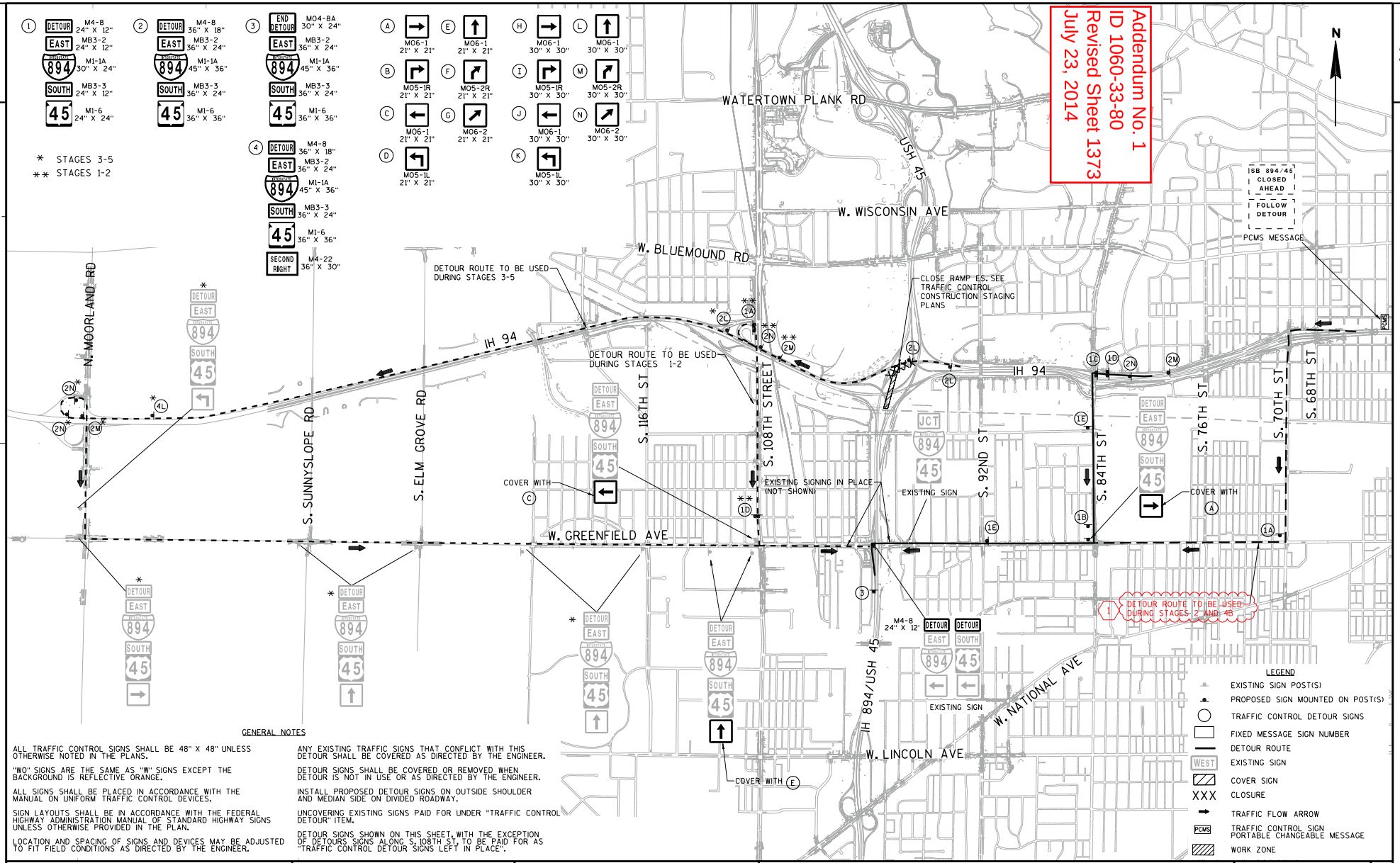
WISDOT/CADDS SHEET 42



PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 4B CONSTRUCTION	SHEET 1324	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\026497_s4b.dgn PLOT DATE : 22-JUL-2014 14:27 PLOT BY : MSCDYB PLOT NAME : 026497_s4b PLOT SCALE : 100:1

WISDOT/CADDS SHEET 42



GENERAL NOTES

ALL TRAFFIC CONTROL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED IN THE PLANS.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS REFLECTIVE ORANGE.

ALL SIGNS SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION MANUAL OF STANDARD HIGHWAY SIGNS UNLESS OTHERWISE PROVIDED IN THE PLAN.

LOCATION AND SPACING OF SIGNS AND DEVICES MAY BE ADJUSTED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

ANY EXISTING TRAFFIC SIGNS THAT CONFLICT WITH THIS DETOUR SHALL BE COVERED AS DIRECTED BY THE ENGINEER.

DETOUR SIGNS SHALL BE COVERED OR REMOVED WHEN DETOUR IS NOT IN USE OR AS DIRECTED BY THE ENGINEER.

INSTALL PROPOSED DETOUR SIGNS ON OUTSIDE SHOULDER AND MEDIAN SIDE ON DIVIDED ROADWAY.

UNCOVERING EXISTING SIGNS PAID FOR UNDER "TRAFFIC CONTROL DETOUR" ITEM.

DETOUR SIGNS SHOWN ON THIS SHEET, WITH THE EXCEPTION OF DETOURS SIGNS ALONG S. 108TH ST, TO BE PAID FOR AS "TRAFFIC CONTROL DETOUR SIGNS LEFT IN PLACE".

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	DETOUR - RAMP ES (1 OF 2) STAGES 2-5	SHEET 1373	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\027023_dt.dgn PLOT DATE : 22-JUL-2014 13:02 PLOT BY : MSCD1S PLOT NAME : 027023_dt PLOT SCALE : 2100:1
WISDOT/CADDS SHEET 42

REMOVING CRASH BARRELS

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	204.9060.S.0001 REMOVING CRASH BARRELS EACH
1000	3	**MAINLINE** IH 45/894 NB	283NS+35	-	283NS+89	1
		SUBTOTAL				1
1000	4	**MAINLINE** IH 45/894 NB	298NS+40	-	298NS+95	1
		SUBTOTAL				1
		TOTAL				2

REMOVING NOISE BARRIER

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.9090.S.0001 REMOVING NOISE BARRIER LF
1000	1	**MAINLINE** IH 94 WB	243EW+80	-	256EW+04	LT	1,198
		SUBTOTAL					1,198
1000	2	**MAINLINE** IH 94 WB	238EW+59	-	245EW+54	LT/RT	697
		SUBTOTAL					697
		TOTAL					1,895

REMOVING RETAINING WALL

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.9090.S.0002 REMOVING RETAINING WALL LF
1000	2	RAMP FC	798FC+75	-	806FC+68	LT	802
		TOTAL					802

1

REMOVING DECORATIVE FENCE

CATEGORY	STAGE	ROADWAY	FROM STATION	FROM OFFSET	TO STATION	TO OFFSET	204.9090.S.0003 REMOVING DECORATIVE FENCE LF
1000	2	HONEYCREEK CORPORATION CENTER	55CH+63	15' RT	55CH+75	15' RT	12
			56CH+26	15' RT	56CH+72	16' RT	46
		TOTAL					58

REMOVING HIGH MAST LIGHTING TOWER ITEMS

CATEGORY	STAGE	ROADWAY	DESCRIPTION	STATION	SPV.0060.0010 REMOVING HIGH MAST LIGHTING TOWER CONCRETE BASE EACH	SPV.0060.0011 REMOVING HIGH MAST LIGHTING TOWER EACH
1000	2	**TEMPORARY ROADS** RAMP EWB	HML-40-131	28EWB+80	2	1
		RAMP NEA	HML-40-138	11NEA+59	2	1
		SUBTOTALS			4	2
1000	3	**TEMPORARY ROADS** RAMP NEA	HML-40-095	5NEA+03	1	1
		SUBTOTALS			1	1
		TOTALS			5	3

REMOVING GROUT PIPE

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	SPV.0060.0012 REMOVING GROUT PIPE EACH
1000	1	**MAINLINE** IH 45/894 NB	321NS+30	7' RT	1
			321NS+30	45' RT	1
			321NS+30	85' RT	1
			321NS+30	125' RT	1
		IH 45/894 SB	321NS+30	54' LT	1
			321NS+30	108' LT	1
			321NS+30	122' LT	1
		TOTAL			7

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SALVAGING CRASH CUSHION

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	SPV.0060.0100 SALVAGING CRASH CUSHION EACH
		MAINLINE			
1000	1	IH 45/894 NB			
			266NS+52	49' RT	1
		IH 94 WB			
			269EW+35	--	1
		RAMPS			
		RAMP NW			
			488NW+24	120' RT	1
		SUBTOTAL			3
		MAINLINE			
1000	2	IH 94 EB			
			142EW+10	4' LT	1
		SUBTOTAL			1
		RAMPS			
1000	3	RAMP SA			
			550SA+47	24' RT	1
			565SA+61	6' RT	1
		SUBTOTAL			2
		MAINLINE			
		IH 94 EB			
			261EW+91	72' RT	1
		RAMP FB			
			747FB+79	39' RT	1
1000	4				
		RAMP FC			
			832FC+45	15' RT	1
		SUBTOTAL			3
		TOTAL			9

1

REMOVING TEMPORARY SHORING LEFT IN PLACE

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	SPV.0090.0012 REMOVING TEMPORARY SHORING LEFT IN PLACE LF
1000	4	RAMP FB				
			745FB+70	-	746FB+93	122
		TOTALS				122

REMOVING GEODETIC SURVEY MONUMENT

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	SPV.0105.0010 REMOVING GEODETIC SURVEY MONUMENT 2X03 LS	SPV.0105.0011 REMOVING GEODETIC SURVEY MONUMENT MILWAUKEE GPS AZ MARK LS
		LOCAL ROADS				
1000	2	W. WISCONSIN AVENUE				
			31WX+72	111' LT	--	1
		SUBTOTALS			--	1
		LOCAL ROADS				
1000	3	W. WISCONSIN AVENUE				
			29WX+03	8' LT	1	--
		SUBTOTALS			1	--
		TOTALS			1	1

REMOVING PLAYGROUND

CATEGORY	STAGE	LOCATION	OFFSET	SPV.0105.0015 REMOVING PLAYGROUND LS
1000	1	RAMP BB		
		818BB+45	8.92 RT	1
		SUBTOTAL		1
		TOTAL		1

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REMOVING WEATHER STATIONS

CATEGORY	STAGE	LOCATION	STATION	OFFSET	SPV.0105.0016 REMOVING WEATHER STATION CHESTER STREET LS	SPV.0105.0017 REMOVING WEATHER STATION ZOOFARI CENTER LS
1000	2	W. CHESTER STREET				
			49CH+05	43' RT	1	--
		IH 894/USH 45 SB				
			318NS+75	140' LT	--	1
		TOTALS			1	1

TEMPORARY SHORING

STAGE	ROADWAY	STATION	TO	STATION	OFFSET	511.1300.0003 TEMPORARY SHORING 344NS+62 TO 346NS+00 SF	511.1300.0004 TEMPORARY SHORING 595SW+59 TO 595SW+78 SF	511.1300.0005 TEMPORARY SHORING 317NS+85 TO 318NS+20 SF	511.1300.0006 TEMPORARY SHORING 321NS+38 TO 323NS+97 SF	511.1300.0007 TEMPORARY SHORING 326NS+28 TO 327NS+14 SF	511.1300.0008 TEMPORARY SHORING 269EW+98 TO 279EW+44 SF	511.1300.0009 TEMPORARY SHORING 273EW+97 TO 279EW+25 SF	511.1300.0010 TEMPORARY SHORING 313NS+33 TO 318NS+00 SF
	MAINLINE												
1A	IH 894 / USH 45												
		344NS+62		346NS+00	RT	3,640	--	--	--	--	--	--	--
	RAMPS												
	RAMP SW												
		595SW+59		595SW+78	LT	--	456	--	--	--	--	--	--
	MAINLINE												
1B	IH 894 / USH 45												
		317NS+85		318NS+20	LT	--	--	910	--	--	--	--	--
		321NS+38		323NS+97	RT	--	--	--	2,849	--	--	--	--
		326NS+28		327NS+14	LT	--	--	--	--	2,088	--	--	--
	IH 94												
		269EW+98		280EW+08	RT	--	--	--	--	--	12,120	--	--
		273EW+97		280EW+08	LT	--	--	--	--	--	--	7,332	--
	MAINLINE												
1C	IH 894 / USH 45												
		313NS+33		318NS+00	LT	--	--	--	--	--	--	--	12,064
	TOTALS					3,640	456	910	2,849	2,088	12,120	7,332	12,064

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1

STAGE	ROADWAY	STATION	TO	STATION	OFFSET	511.1300.0001 TEMPORARY SHORING 24FCB+78 TO 32FCB+19 SF	511.1300.0002 TEMPORARY SHORING 41FCB+67 TO 45FCB+07 SF	511.1300.0011 TEMPORARY SHORING 232EW+65 TO 233EW+15 SF	511.1300.0012 TEMPORARY SHORING 233EW+76 TO 234EW+26 SF	511.1300.0013 TEMPORARY SHORING 152EW+14 TO 152EW+71 SF	511.1300.0014 TEMPORARY SHORING 802BB+15 TO 802BB+36 SF	511.1300.0015 TEMPORARY SHORING 802BB+16 TO 802BB+58 SF	511.1300.0016 TEMPORARY SHORING 802BB+58 TO 803BB+00 SF	511.1300.0017 TEMPORARY SHORING 802BB+80 TO 803BB+01 SF	511.1300.0018 TEMPORARY SHORING 7FCV+83 TO 9FCV+53 SF	511.1300.0019 TEMPORARY SHORING 9FCV+21 TO 10FCV+76 SF
	MAINLINE															
2A	IH 94															
		152EW+14		152EW+71	RT	--	--	--	--	1,026	--	--	--	--	--	--
		232EW+65		233EW+15	LT/RT	--	--	1,600	--	--	--	--	--	--	--	--
		233EW+76		234EW+26	LT	--	--	--	1,600	--	--	--	--	--	--	--
	RAMPS															
	RAMP FCB															
		24FCB+78		32FCB+19	LT	2,060	--	--	--	--	--	--	--	--	--	--
		41FCB+67		45FCB+07	LT	--	1,512	--	--	--	--	--	--	--	--	--
3A	B-40-93	7FCV+83		9FCV+53	LT/RT	--	--	--	--	--	--	--	--	--	1,405	--
	RAMPS															
4A	RAMP BB															
		802BB+15		802BB+36	LT	--	--	--	--	--	273	--	--	--	--	--
		802BB+16		802BB+58	RT	--	--	--	--	--	--	546	--	--	--	--
		802BB+58		803BB+00	LT	--	--	--	--	--	--	--	546	--	--	--
		802BB+80		803BB+01	RT	--	--	--	--	--	--	--	--	273	--	--
	B-40-93	9FCV+21		10FCV+76	LT/RT	--	--	--	--	--	--	--	--	--	--	1,210
	TOTALS					2,060	1,512	1,600	1,600	1,026	273	546	546	273	1,405	1,210

ALL ITEMS CATEGORY 1000

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	MISCELLANEOUS QUANTITIES	SHEET: 1583	E

TRAFFIC CONTROL ITEMS (CONTINUED)

CATEGORY	STAGE	LOCATION	DAYS	643.0800* TRAFFIC CONTROL ARROW BOARDS EACH**	643.0800* TRAFFIC CONTROL ARROW BOARDS DAY	643.0900 TRAFFIC CONTROL SIGNS EACH**	643.0900 TRAFFIC CONTROL SIGNS DAY	643.0910* TRAFFIC CONTROL COVERING SIGNS TYPE I EACH	643.1050* TRAFFIC CONTROL SIGNS PCMS EACH**	643.1050* TRAFFIC CONTROL SIGNS PCMS DAY	SPV.0045.0400 TRUCK OR TRAILER MOUNTED ATTENUATOR DAY	SPV.0060.0404 TRAFFIC CONTROL COVERING SIGNS TYPE I LEFT IN PLACE EACH
		RAMP FC		--	--	--	--	--	--	--	--	--
		RAMP FD		--	--	1	50	--	--	--	--	--
		W. BLUEMOUND ROAD		--	--	13	650	--	--	--	--	--
		W. WISCONSIN AVENUE		--	--	13	650	--	--	--	--	--
		W. O'CONNOR STREET		--	--	2	100	--	--	--	--	--
		SUBTOTALS			100		9,800	1		200	--	11
1000	3B	**STAGE 3B SECTION 2 (EAST LEG)**	84									
		IH 94 EB		--	--	41	3,444	--	--	--	--	--
		IH 94 WB		--	--	61	5,124	--	--	--	--	--
		W. BLUEMOUND ROAD		--	--	13	1,092	--	--	--	--	--
		W. WISCONSIN AVENUE		--	--	13	1,092	--	--	--	--	--
		W. O'CONNOR STREET		--	--	2	168	--	--	--	--	--
		SUBTOTALS			--		10,920	--		--	--	--
1000	4A/4B	**STAGE 4A/4B SECTION 2 (EAST LEG)**	70									
		IH 894/USH 45 NB		--	--	19	1,330	--	1	70	--	--
		IH 894/USH 45 SB		--	--	19	1,330	--	1	70	--	--
		IH 94 EB		2	140	58	4,060	--	1	70	--	--
		IH 94 WB		2	140	63	4,410	2 (1)	1	70	--	--
		RAMP SW		--	--	--	--	--	--	--	--	--
		RAMP NW		--	--	--	--	--	--	--	--	--
		RAMP WS		--	--	--	--	--	--	--	--	--
		RAMP FD		--	--	1	70	--	--	--	--	--
		W. BLUEMOUND ROAD		--	--	13	910	--	--	--	--	--
		W. WISCONSIN AVENUE			--	13	910	--	--	--	--	--

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(CONTINUED ON NEXT SHEET)

TRAFFIC CONTROL ITEMS (CONTINUED)

CATEGORY	STAGE	LOCATION	DAYS	643.0800* TRAFFIC CONTROL ARROW BOARDS EACH**	643.0800* TRAFFIC CONTROL ARROW BOARDS DAY	643.0900 TRAFFIC CONTROL SIGNS EACH**	643.0900 TRAFFIC CONTROL SIGNS DAY	643.0910* TRAFFIC CONTROL COVERING SIGNS TYPE I EACH	643.1050* TRAFFIC CONTROL SIGNS PCMS EACH**	643.1050* TRAFFIC CONTROL SIGNS PCMS DAY	SPV.0045.0400 TRUCK OR TRAILER MOUNTED ATTENUATOR DAY	SPV.0060.0404 TRAFFIC CONTROL COVERING SIGNS TYPE I LEFT IN PLACE EACH
1000	4A/4B	W. ADLER STREET		--	--	2	140	--	--	--	--	--
		S. 84TH STREET		--	--	29	2,030	--	--	--	--	--
		W. HONEY CREEK PARKWAY		--	--	3	210	--	--	--	--	--
		S. 75TH STREET		--	--	1	70	--	--	--	--	--
		S. 74TH STREET		--	--	1	70	--	--	--	--	--
		S. 73RD STREET		--	--	2	140	--	--	--	--	--
		W. O'CONNOR STREET		--	--	2	140	--	--	--	--	--
		W. KEARNEY STREET		--	--	5	350	--	--	--	--	--
		MITCHELL BLVD ENTRANCE RAMP		--	--	3	210	--	--	--	--	--
		SUBTOTALS			280		16,380	2	1	280	--	--
1000	5A	**STAGE 5A SECTION 2 (EAST LEG)**	35									
		IH 894/USH 45 NB		--	--	19	665	--	1	35	--	--
		IH 894/USH 45 SB		--	--	19	665	--	1	35	--	--
		IH 94 EB		2	70	24	840	--	1	35	--	--
		IH 94 WB		--	--	32	1,120	--	1	35	--	--
		RAMP SW		--	--	--	--	--	--	--	--	--
		RAMP NW		--	--	2	70	--	--	--	--	--
		RAMP WS		--	--	8	280	--	--	--	--	--
		RAMP FC		--	--	--	--	--	--	--	--	--
		RAMP FD		--	--	1	35	--	--	--	--	--
		W. BLUEMOUND ROAD		--	--	13	455	--	--	--	--	--
		W. WISCONSIN AVENUE		--	--	13	455	--	--	--	--	--
		SUBTOTALS			70		4,585	--		140	--	--
		UNDISTRIBUTED			324		39,967	3		457	500	5
		TOTALS			1,942		239,804	16		2,744	500	27

*ADDITIONAL QUANTITIES FOUND ELSEWHERE
**FOR INFORMATION ONLY

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WORK ZONE CONSTRUCTION TRAFFIC MERGE WARNING SYSTEM

CATEGORY	STAGE	ROADWAY	LOCATION	SPV.0045.2001 WORK ZONE CONSTRUCTION TRAFFIC MERGE WARNING SYSTEM DAY
1000	1B	USH 45 NB	NORTH LEG	104
		USH 45 SB	NORTH LEG	104
	2A/2B	IH 94 EB	WEST LEG	86
		IH 94 EB	EAST LEG	86
		IH 94 WB	EAST LEG	86
		RAMP NW	WEST LEG	86
	3	USH 45 SB	NORTH LEG	70
		IH 94 WB	EAST LEG	70
	4	USH 45 SB	NORTH LEG	70
		IH 94 EB	EAST LEG	70
		SUBTOTALS		832
		UNDISTRIBUTED		100
		TOTALS		932

TRAFFIC CHANNELIZING CURB SYSTEM

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	SPV.0090.0401 TRAFFIC CHANNELIZING CURB SYSTEM LF
1000	2	IH 894\USH 45 NB	35NSA+25	-	36NSA+26	100
	3	IH 94 EB	26EWB+60	-	27EWB+60	100
			187EW+58	-	188EW+58	100
	4	IH 894\USH 45 SB	30NSB+42	-	30NSB+20	80
			15WCA+00	-	16WCA+00	100
		RAMP WC	749WC+45	-	750WC+44	100
	5	IH 94 EB	34EWB+50	-	35EWB+30	80
		SUBTOTALS				660
		UNDISTRIBUTED				100
		TOTALS				760

TRAFFIC CONTROL CLOSURE ITEMS

CATEGORY	ROADWAY	SPV.0060.0400 TRAFFIC CONTROL CLOSE-OPEN FREEWAY ENTRANCE RAMP EACH	SPV.0060.0401 TRAFFIC CONTROL CLOSE-OPEN FREEWAY TO FREEWAY SYSTEM RAMP EACH	SPV. 0060.0402 TRAFFIC CONTROL INTERIM FREEWAY LANE CLOSURE EACH	SPV. 0060.0403 TRAFFIC CONTROL LOCAL ROAD LANE CLOSURES EACH	SPV. 0060.0408 TRAFFIC CONTROL FULL FREEWAY CLOSURE EACH
1000	VARIOUS	850	590	2,265	30	280
	TOTALS	850	590	2,265	30	280

1

TRAFFIC CONTROL LEFT IN PLACE ITEMS

CATEGORY	STAGE	LOCATION	SPV.0060.0500 TRAFFIC CONTROL DRUMS LEFT IN PLACE EACH	SPV.0060.0501 TRAFFIC CONTROL BARRICADES TYPE II LEFT IN PLACE EACH	SPV.0060.0502 TRAFFIC CONTROL BARRICADES TYPE III LEFT IN PLACE EACH	SPV.0060.0503 TRAFFIC CONTROL WARNING LIGHTS TYPE A LEFT IN PLACE EACH	SPV.0060.0504 TRAFFIC CONTROL WARNING LIGHTS TYPE C LEFT IN PLACE EACH	SPV.0060.0505 TRAFFIC CONTROL SIGNS LEFT IN PLACE EACH
1000	5	IH 894\USH 45 NB	--	--	--	--	--	16
		IH 894/USH 45 SB	55	--	--	--	--	6
		IH 94 EB	75	--	--	--	55	12
		IH 94 WB	261	--	17	34	20	29
		RAMP NW	86	--	3	6	--	3
		RAMP SW	33	--	--	--	9	2
		RAMP WS	35	--	--	--	--	4
		W. BLUEMOUND ROAD	64	--	15	30	5	13
		W. WISCONSIN AVENUE	20	2	26	52	5	13
		SUBTOTALS	629	2	61	122	94	98
		UNDISTRIBUTED	35	5	5	10	5	5
		TOTALS	664	7	66	132	99	103

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Revised Sheet 1731
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PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	MISCELLANEOUS QUANTITIES	SHEET: 1731	E

IH 94 RAMPS & STH 181

ALL ITEMS ARE CATEGORY 1500 UNLESS OTHERWISE NOTED

3

SIGNAL MOUNTING HARDWARE
IH 94 RAMPS & STH 181

LOCATION	658.5069.3001 SIGNAL MOUNTING HARDWARE LS
IH 94 RAMPS & STH 181 (S. 84TH STREET)	1
TOTAL	1

TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS
IH 94 EB RAMPS & STH 181

LOCATION	661.0200.3001 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS LS	661.0300* GENERATORS DAY
IH 94 EB RAMPS & STH 181 (S. 84TH STREET)	1	2
TOTAL	1	2

*ADDITIONAL QUANTITIES SHOWN ELSEWHERE

TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS
IH 94 WB RAMPS & STH 181

LOCATION	661.0200.3002 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS LS	661.0300* GENERATORS DAY
IH 94 WB RAMPS & STH 181 (S. 84TH STREET)	1	2
TOTAL	1	2

*ADDITIONAL QUANTITIES SHOWN ELSEWHERE

INSTALL STATE SUPPLIED VIDEO DETECTION CABLE

FROM	TO	SPV.0090.3003* INSTALL CAMERA POWER CABLE LF
CB1	SB7 (V1)	351
CB1	SB2 (V2)	409
CB1	SB3 (V3)	380
CB1	SB21 (V4)	400
CB1	SB15 (V5)	763
CB1	SB22 (V6)	370
TOTAL		2673

*ADDITIONAL QUANTITIES SHOWN ELSEWHERE

INSTALL STATE SUPPLIED CAT-5E CABLE

FROM	TO	SPV.0090.3004* INSTALL CAT-5E CABLE LF
CB1	SB6 (R1)	271
CB1	SB6 (R2)	271
CB1	SB6 (R3)	271
SB6 (R1)	SB6 (V1)	84
SB6 (R2)	SB2 (R4)	274
SB2 (R4)	SB2 (V2)	99
S67 (R3)	SB3 (R5)	265
SB3 (R5)	SB3 (V3)	79
CB1	SB19 (R6)	305
CB1	SB19 (R7)	305
SB19 (R6)	SB19 (V4)	99
SB19 (R7)	CB2 (R8)	166
CB2 (R8)	SB14 (V5)	292
CB1	SB20 (R9)	310
SB20 (R9)	SB20 (V6)	64
TOTAL		3155

*ADDITIONAL QUANTITIES SHOWN ELSEWHERE

TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS
IH 94 WB RAMPS & STH 181

LOCATION	661.0200.3003 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS LS	661.0300* GENERATORS DAY
IH 94 WB RAMPS & STH 181 (S. 84TH STREET)	1	2
TOTAL	1	2

*ADDITIONAL QUANTITIES SHOWN ELSEWHERE

1

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TRANSPORTING SIGNAL AND LIGHTING MATERIALS

LOCATION	SPV.0105.3003 TRANSPORTING SIGNAL AND LIGHTING MATERIALS IH 94 RAMPS & STH 181 LS
IH 94 RAMPS & STH 181 (S. 84TH STREET)	1
TOTAL	1

PROJECT NO: 1060-33-80	HWY:IH 94	COUNTY: MILWAUKEE	MISCELLANEOUS QUANTITIES	SHEET: 1830	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\030241_mq_sp.ppt PLOT DATE : 7/22/2014 2:34:31 PM PLOT BY : MSCCEJ PLOT NAME : 030241_mq_sp11 PLOT SCALE : 1:1

IH 94 RAMPS & STH 181

ALL ITEMS ARE CATEGORY 1500 UNLESS OTHERWISE NOTED

INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET

LOCATION	SPV.0105.3006 INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB1 LS	SPV.0105.3017 INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB2 LS
IH 94 RAMPS & STH 181 (S. 84TH STREET) CB1	1	--
IH 94 RAMPS & STH 181 (S. 84TH STREET) CB2	--	1
TOTAL	1	1

EXISTING TEMPORARY EVP SYSTEM

LOCATION	SPV.0105.3014 EXISTING TEMPORARY EVP SYSTEM IH 94 EB RAMPS & STH 181 LS
IH 94 EB RAMPS & STH 181 (S. 84TH STREET)	1
TOTAL	1

TRANSPORTING AND INSTALLING STATE FURNISHED ADAPTABLE TRAFFIC SIGNAL CAMERAS

LOCATION	SPV.0105.3008 TRANSPORTING AND INSTALLING STATE FURNISHED ADAPTABLE TRAFFIC SIGNAL CAMERAS IH 94 RAMPS & STH 181 LS
IH 94 RAMPS & STH 181 (S. 84TH STREET)	1
TOTAL	1

EXISTING TEMPORARY EVP SYSTEM

LOCATION	SPV.0105.3015 EXISTING TEMPORARY EVP SYSTEM IH 94 WB RAMPS & STH 181 LS
IH 94 WB RAMPS & STH 181 (S. 84TH STREET)	1
TOTAL	1

INSTALL STATE FURNISHED EVP DETECTOR HEADS

LOCATION	SPV.0105.3011 INSTALL STATE FURNISHED EVP DETECTOR HEADS IH 94 RAMPS & STH 181 LS
IH 94 RAMPS & STH 181 (S. 84TH STREET)	1
TOTAL	1

TEMPORARY TRAFFIC SIGNAL OPERATION WITH PERMANENT TRAFFIC SIGNAL EQUIPMENT

LOCATION	SPV.0105.3020 TEMPORARY TRAFFIC SIGNAL OPERATION WITH PERMANENT TRAFFIC SIGNAL EQUIPMENT LS
IH 94 WB RAMPS & STH 181 (S. 84TH STREET)	0
TOTAL	0

1

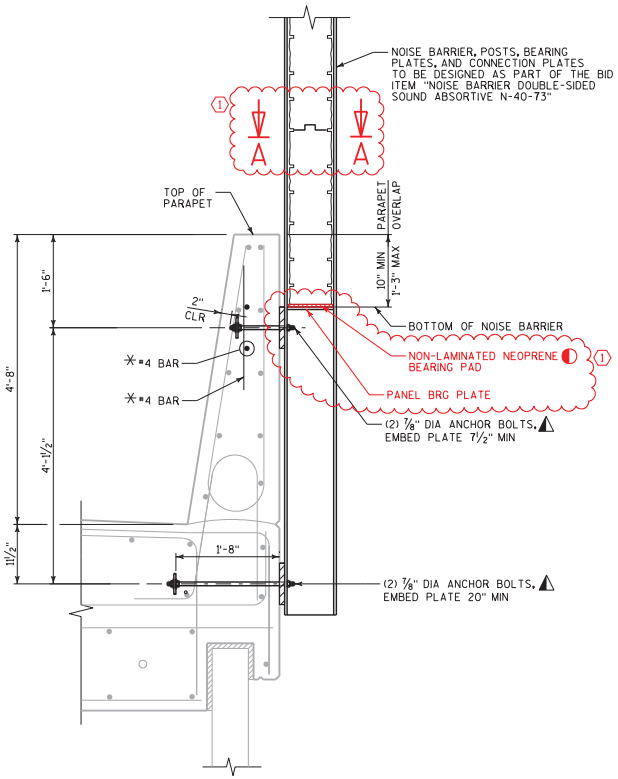
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PROJECT NO: 1060-33-80	HWY:IH 94	COUNTY: MILWAUKEE	MISCELLANEOUS QUANTITIES	SHEET: 1831	E

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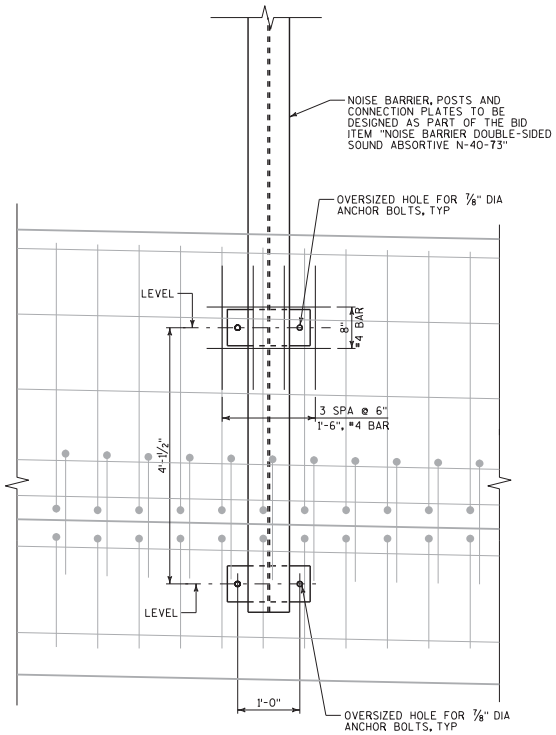
STATE PROJECT NUMBER
1060-33-80

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ID 1060-33-80
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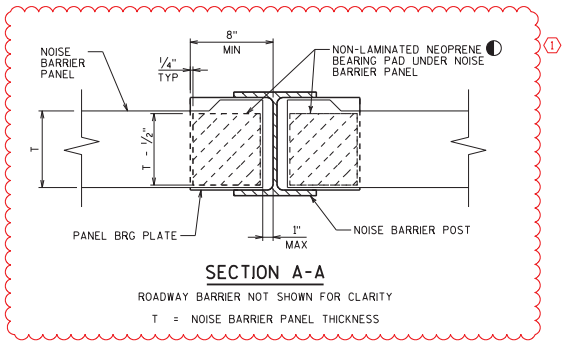
SECTION AT NOISE BARRIER POST

TYPICAL AT EACH POST LOCATION



ELEVATION AT NOISE BARRIER POST

TYPICAL AT EACH POST LOCATION



SECTION A-A

ROADWAY BARRIER NOT SHOWN FOR CLARITY

T = NOISE BARRIER PANEL THICKNESS

LEGEND

▲ NOISE BARRIER ANCHOR BOLT ASSEMBLY IS INCLUDED WITH THE RETAINING WALL BID ITEMS AND ARE NOT PART OF THE NOISE BARRIER BID ITEMS.

✳ EXACT LOCATION AND SPACING OF #4 BARS TO BE COORDINATED AND COINCIDE WITH NOISE BARRIER POST SPACING AND MOUNTING DETAILS SHOWN ON APPROVED NOISE BARRIER SHOP DRAWINGS. SEE R-40-552 PLANS FOR #4 BAR DETAILS.

① NON-LAMINATED NEOPRENE BEARING PAD (MIN THICK 1/8", MAX THICK 3/4") USED TO SHIM NOISE BARRIER AS NECESSARY. A MAX OF 3 SHIMS MAY BE USED WITH A MAX TOTAL SHIM HEIGHT OF 1 1/4". A MIN OF ONE SHIM IS REQUIRED AT EACH END OF THE NOISE BARRIER PANEL ON THE STEEL BRG PLATE. NON-LAMINATED NEOPRENE BEARING PADS USED AS SHIMS ARE INCLUDED IN THE BID ITEM "NOISE BARRIER DOUBLE-SIDED SOUND ABSORTIVE N-40-73".

William C. Drecher KAR 07/15/14

WISCONSIN
KARL E. SCHMID
E-30812
MILWAUKEE, WI
PROFESSIONAL ENGINEER
7/15/2014

NO.	DATE	REVISION	BY
1	7/15/14	AESTHETIC PATTERN MODIFICATIONS	KES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE N-40-73

DRAWN BY TEK | PLANS CK'D. KES

NOISE BARRIER POST CONNECTION DETAILS

SHEET 4 OF 6

3382

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SCHEDULE OF ITEMS REVISED:

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SECTION 0001 ROADWAY ITEMS					
0005	108.3100.S INCENTIVE/DISINCENTIVE FOR INTERIM COMPLETION OF WORK	0.100 CD		.		.
0010	201.0105 CLEARING	269.000 STA		.		.
0015	201.0120 CLEARING	1,211.000 ID		.		.
0020	201.0205 GRUBBING	269.000 STA		.		.
0025	201.0220 GRUBBING	1,211.000 ID		.		.
0030	203.0200 REMOVING OLD STRUCTURE (STATION) 0001. 280+00 NS	LUMP	LUMP			.
0035	203.0200 REMOVING OLD STRUCTURE (STATION) 0002. 586SW+76.79	LUMP	LUMP			.
0040	203.0200 REMOVING OLD STRUCTURE (STATION) 0003. 590SW+89.63	LUMP	LUMP			.
0045	203.0200 REMOVING OLD STRUCTURE (STATION) 0004. 591SW+15.01	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0050	203.0200 REMOVING OLD STRUCTURE (STATION) 0005. 64+02.9	LUMP	LUMP			.
0055	203.0200 REMOVING OLD STRUCTURE (STATION) 0006. 237+50	LUMP	LUMP			.
0060	203.0200 REMOVING OLD STRUCTURE (STATION) 0007. 237+60	LUMP	LUMP			.
0065	203.0200 REMOVING OLD STRUCTURE (STATION) 0008. 196+88	LUMP	LUMP			.
0070	203.0200 REMOVING OLD STRUCTURE (STATION) 0009. 197+06	LUMP	LUMP			.
0075	203.0200 REMOVING OLD STRUCTURE (STATION) 0010. 201+60	LUMP	LUMP			.
0080	203.0200 REMOVING OLD STRUCTURE (STATION) 0011. 572SA+25	LUMP	LUMP			.
0085	203.0200 REMOVING OLD STRUCTURE (STATION) 0012. 559SA+50	LUMP	LUMP			.
0090	203.0200 REMOVING OLD STRUCTURE (STATION) 0013. 26+25.00	LUMP	LUMP			.
0095	203.0200 REMOVING OLD STRUCTURE (STATION) 0014. 587SW+01.22	LUMP	LUMP			.
0100	203.0200 REMOVING OLD STRUCTURE (STATION) 0015. 2FCV+72	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0105	203.0200 REMOVING OLD STRUCTURE (STATION) 0016. 233EW+84	LUMP	LUMP			.
0110	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0001. B-40-88	LUMP	LUMP			.
0115	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0002. B-40-90	LUMP	LUMP			.
0120	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0003. B-40-91	LUMP	LUMP			.
0125	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0004. B-40-92	LUMP	LUMP			.
0130	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0005. B-40-0093	LUMP	LUMP			.
0135	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0006. B-40-95	LUMP	LUMP			.
0140	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0007. B-40-98	LUMP	LUMP			.
0145	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0008. B-40-99	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0150	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0009. B-40-106	LUMP	LUMP			.
0155	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0010. B-40-129	LUMP	LUMP			.
0160	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0011. B-40-130	LUMP	LUMP			.
0165	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0012. B-40-131	LUMP	LUMP			.
0170	204.0100 REMOVING PAVEMENT **P**	289,685.000 SY		.		.
0175	204.0109.S REMOVING CONCRETE SURFACE PARTIAL DEPTH **P**	14,097.000 SF		.		.
0180	204.0110 REMOVING ASPHALTIC SURFACE **P**	13,409.000 SY		.		.
0185	204.0125 REMOVING ASPHALTIC SURFACE MILLING	642.000 TON		.		.
0190	204.0150 REMOVING CURB & GUTTER **P**	9,465.000 LF		.		.
0195	204.0155 REMOVING CONCRETE SIDEWALK **P**	9,719.000 SY		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0200	204.0157 REMOVING CONCRETE BARRIER **P**	41,483.000 LF		.		.
0205	204.0165 REMOVING GUARDRAIL **P**	4,064.000 LF		.		.
0210	204.0170 REMOVING FENCE **P**	28,757.000 LF		.		.
0215	204.0195 REMOVING CONCRETE BASES	194.000 EACH		.		.
0220	204.0210 REMOVING MANHOLES	137.000 EACH		.		.
0225	204.0220 REMOVING INLETS	535.000 EACH		.		.
0230	204.0245 REMOVING STORM SEWER (SIZE) 0001. 12-INCH **P**	21,289.000 LF		.		.
0235	204.0245 REMOVING STORM SEWER (SIZE) 0002. 15-INCH **P**	2,052.000 LF		.		.
0240	204.0245 REMOVING STORM SEWER (SIZE) 0003. 18-INCH **P**	1,912.000 LF		.		.
0245	204.0245 REMOVING STORM SEWER (SIZE) 0004. 21-INCH **P**	286.000 LF		.		.
0250	204.0245 REMOVING STORM SEWER (SIZE) 0005. 24-INCH **P**	921.000 LF		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0255	204.0245 REMOVING STORM SEWER (SIZE) 0006. 30-INCH **P**	414.000 LF		.		.
0260	204.0245 REMOVING STORM SEWER (SIZE) 0007. 36-INCH **P**	439.000 LF		.		.
0265	204.0245 REMOVING STORM SEWER (SIZE) 0008. 42-INCH **P**	3,219.000 LF		.		.
0270	204.0245 REMOVING STORM SEWER (SIZE) 0009. 48-INCH **P**	2,181.000 LF		.		.
0275	204.0245 REMOVING STORM SEWER (SIZE) 0010. 54-INCH **P**	668.000 LF		.		.
0280	204.0245 REMOVING STORM SEWER (SIZE) 0013. 72-INCH **P**	225.000 LF		.		.
0285	204.0245 REMOVING STORM SEWER (SIZE) 0100. 8-INCH **P**	135.000 LF		.		.
0290	204.0280 SEALING PIPES	121.000 EACH		.		.
0295	204.9060.S REMOVING (ITEM DESCRIPTION) 0001. CRASH BARRELS	2.000 EACH		.		.
0300	204.9060.S REMOVING (ITEM DESCRIPTION) 0002. APRON ENDWALL	1.000 EACH		.		.
0305	204.9090.S REMOVING (ITEM DESCRIPTION) 0001. NOISE BARRIER **P**	1,895.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0310	204.9090.S REMOVING (ITEM DESCRIPTION) 0002. RETAINING WALL **P**	802.000 LF		.		.
0315	204.9090.S REMOVING (ITEM DESCRIPTION) 0003. DECORATIVE FENCE **P**	58.000 LF		.		.
0320	204.9090.S REMOVING (ITEM DESCRIPTION) 0005. DRAIN SLOTTED VANE **P**	917.000 LF		.		.
0325	205.0100 EXCAVATION COMMON **P**	948,814.000 CY		.		.
0330	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0001. B-40-537	LUMP	LUMP			.
0335	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0002. B-40-538	LUMP	LUMP			.
0340	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0003. B-40-789	LUMP	LUMP			.
0345	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0004. B-40-791	LUMP	LUMP			.
0350	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0005. B-40-798	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0355	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0006. B-40-849	LUMP	LUMP			.
0360	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0007. B-40-852	LUMP	LUMP			.
0365	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0009. B-40-857	LUMP	LUMP			.
0370	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0010. B-40-862	LUMP	LUMP			.
0375	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0011. B-40-863	LUMP	LUMP			.
0380	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0012. B-40-864	LUMP	LUMP			.
0385	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0013. B-40-866	LUMP	LUMP			.
0390	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0014. B-40-891	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0395	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0001. R-40-504	LUMP	LUMP			.
0400	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0002. R-40-546	LUMP	LUMP			.
0405	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0003. R-40-548	LUMP	LUMP			.
0410	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0004. R-40-554	LUMP	LUMP			.
0415	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0005. R-40-555	LUMP	LUMP			.
0420	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0006. R-40-560	LUMP	LUMP			.
0425	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0007. R-40-618	LUMP	LUMP			.
0430	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0008. R-40-619	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0435	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0009. R-40-620	LUMP	LUMP			.
0440	209.0100 BACKFILL GRANULAR	41,796.000 CY		.		.
0445	209.0200.S BACKFILL CONTROLLED LOW STRENGTH	617.000 CY		.		.
0450	210.0100 BACKFILL STRUCTURE **P**	8,443.000 CY		.		.
0455	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH **P**	284,083.000 TON		.		.
0460	312.0115 SELECT CRUSHED MATERIAL **P**	205,909.000 CY		.		.
0465	415.0075 CONCRETE PAVEMENT 7 1/2-INCH **P**	7,443.000 SY		.		.
0470	415.0080 CONCRETE PAVEMENT 8-INCH **P**	10,999.000 SY		.		.
0475	415.0085 CONCRETE PAVEMENT 8 1/2-INCH **P**	37,091.000 SY		.		.
0480	415.0090 CONCRETE PAVEMENT 9-INCH **P**	48,763.000 SY		.		.
0485	415.0095 CONCRETE PAVEMENT 9 1/2-INCH **P**	4,550.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0490	415.0210 CONCRETE PAVEMENT GAPS	32.000 EACH		.		.
0495	415.0410 CONCRETE PAVEMENT APPROACH SLAB	2,712.000 SY		.		.
0500	415.1080 CONCRETE PAVEMENT HES 8-INCH	1,222.000 SY		.		.
0505	415.1085 CONCRETE PAVEMENT HES 8 1/2-INCH	42.000 SY		.		.
0510	415.1090 CONCRETE PAVEMENT HES 9-INCH	4,569.000 SY		.		.
0515	416.0170 CONCRETE DRIVEWAY 7-INCH **P**	1,721.000 SY		.		.
0520	416.0270 CONCRETE DRIVEWAY HES 7-INCH	666.000 SY		.		.
0525	416.0280 CONCRETE DRIVEWAY HES 8-INCH	138.000 SY		.		.
0530	416.0610 DRILLED TIE BARS	2,628.000 EACH		.		.
0535	416.0620 DRILLED DOWEL BARS	1,001.000 EACH		.		.
0540	416.1725 CONCRETE PAVEMENT REPLACEMENT SHES	80.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0545	440.4410.S INCENTIVE IRI RIDE	51,116.000 DOL	1.00000		51116.00	
0550	455.0115 ASPHALTIC MATERIAL PG64-22	361.000 TON	.		.	
0555	455.0120 ASPHALTIC MATERIAL PG64-28	1,842.000 TON	.		.	
0560	455.0150 ASPHALTIC MATERIAL PG70-28P	116.000 TON	.		.	
0565	455.0605 TACK COAT	3,706.000 GAL	.		.	
0570	460.1101 HMA PAVEMENT TYPE E-1	779.000 TON	.		.	
0575	460.1110 HMA PAVEMENT TYPE E-10	30,710.000 TON	.		.	
0580	460.1130 HMA PAVEMENT TYPE E-30	7,183.000 TON	.		.	
0585	460.2000 INCENTIVE DENSITY HMA PAVEMENT	24,198.000 DOL	1.00000		24198.00	
0590	465.0105 ASPHALTIC SURFACE	234.000 TON	.		.	
0595	465.0120 ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES	77.000 TON	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0600	465.0125 ASPHALTIC SURFACE TEMPORARY	13,430.000 TON		.		.
0605	465.0310 ASPHALTIC CURB	871.000 LF		.		.
0610	502.0100 CONCRETE MASONRY BRIDGES **P**	5,091.000 CY		.		.
0615	502.3100 EXPANSION DEVICE (STRUCTURE) 0001. B-40-852 **P**	LUMP	LUMP			.
0620	502.3200 PROTECTIVE SURFACE TREATMENT **P**	41,511.000 SY		.		.
0625	502.5005 MASONRY ANCHORS TYPE L NO. 5 BARS **P**	171.000 EACH		.		.
0630	503.0137 PRESTRESSED GIRDER TYPE I 36W-INCH **P**	560.000 LF		.		.
0635	503.0146 PRESTRESSED GIRDER TYPE I 45W-INCH **P**	10,222.000 LF		.		.
0640	503.0155 PRESTRESSED GIRDER TYPE I 54W-INCH **P**	13,586.000 LF		.		.
0645	504.0500 CONCRETE MASONRY RETAINING WALLS **P**	13,509.000 CY		.		.
0650	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	362,776.000 LB		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0655	505.0415 BAR STEEL REINFORCEMENT HS RETAINING WALLS	47,270.000 LB		.		.
0660	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	2,235,745 LB		.		.
0665	505.0615 BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	1,459,783 LB		.		.
0670	506.0605 STRUCTURAL STEEL HS **P**	7,299,667 LB		.		.
0675	506.2605 BEARING PADS ELASTOMERIC NON-LAMINATED **P**	406.000 EACH		.		.
0680	506.3010 WELDED STUD SHEAR CONNECTORS 7/8X5-INCH **P**	19,895.000 EACH		.		.
0685	506.3015 WELDED STUD SHEAR CONNECTORS 7/8X6-INCH **P**	20,343.000 EACH		.		.
0690	506.3020 WELDED STUD SHEAR CONNECTORS 7/8X7-INCH **P**	11,536.000 EACH		.		.
0695	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0001. B-40-537 **P**	18.000 EACH		.		.
0700	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0002. B-40-538 **P**	20.000 EACH		.		.
0705	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0003. B-40-789 **P**	18.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	506.4000 STEEL					
0710	DIAPHRAGMS (STRUCTURE)	44.000				
	0004. B-40-791 **P**	EACH		.		.
	506.4000 STEEL					
0715	DIAPHRAGMS (STRUCTURE)	6.000				
	0005. B-40-798 **P**	EACH		.		.
	506.4000 STEEL					
0720	DIAPHRAGMS (STRUCTURE)	6.000				
	0006. B-40-849 **P**	EACH		.		.
	506.4000 STEEL					
0725	DIAPHRAGMS (STRUCTURE)	54.000				
	0007. B-40-857 **P**	EACH		.		.
	506.4000 STEEL					
0730	DIAPHRAGMS (STRUCTURE)	75.000				
	0008. B-40-862 **P**	EACH		.		.
	506.4000 STEEL					
0735	DIAPHRAGMS (STRUCTURE)	30.000				
	0009. B-40-863 **P**	EACH		.		.
	506.4000 STEEL					
0740	DIAPHRAGMS (STRUCTURE)	34.000				
	0010. B-40-864 **P**	EACH		.		.
	506.4000 STEEL					
0745	DIAPHRAGMS (STRUCTURE)	68.000				
	0011. B-40-866 **P**	EACH		.		.
	511.1200 TEMPORARY					
0750	SHORING (STRUCTURE)	350.000				
	0002. R-40-524	SF		.		.
	511.1200 TEMPORARY					
0755	SHORING (STRUCTURE)	990.000				
	0003. R-40-551	SF		.		.
	511.1200 TEMPORARY					
0760	SHORING (STRUCTURE)	605.000				
	0004. R-40-552	SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	511.1300 TEMPORARY					
0765	SHORING (LOCATION) 0001.	2,060.000				
	24FCB+78 TO 32FCB+19	SF		.		.
	511.1300 TEMPORARY					
0770	SHORING (LOCATION) 0002.	1,512.000				
	41FCB+67 TO 45FCB+07	SF		.		.
	511.1300 TEMPORARY					
0775	SHORING (LOCATION) 0003.	3,640.000				
	344NS+62 TO 346NS+00	SF		.		.
	511.1300 TEMPORARY					
0780	SHORING (LOCATION) 0004.	456.000				
	595SW+59 TO 595SW+78	SF		.		.
	511.1300 TEMPORARY					
0785	SHORING (LOCATION) 0005.	910.000				
	317NS+85 TO 318NS+20	SF		.		.
	511.1300 TEMPORARY					
0790	SHORING (LOCATION) 0006.	2,849.000				
	321NS+38 TO 323NS+97	SF		.		.
	511.1300 TEMPORARY					
0795	SHORING (LOCATION) 0007.	2,088.000				
	326NS+28 TO 327NS+14	SF		.		.
	511.1300 TEMPORARY					
0800	SHORING (LOCATION) 0008.	12,120.000				
	269EW+98 TO 279EW+44	SF		.		.
	511.1300 TEMPORARY					
0805	SHORING (LOCATION) 0009.	7,332.000				
	273EW+97 TO 279EW+25	SF		.		.
	511.1300 TEMPORARY					
0810	SHORING (LOCATION) 0010.	12,064.000				
	313NS+33 TO 318NS+00	SF		.		.
	511.1300 TEMPORARY					
0815	SHORING (LOCATION) 0011.	1,600.000				
	232EW+65 TO 233EW+15	SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	511.1300 TEMPORARY					
0820	SHORING (LOCATION) 0012.	1,600.000				
	233EW+76 TO 234EW+26	SF		.		.
	511.1300 TEMPORARY					
0825	SHORING (LOCATION) 0013.	1,026.000				
	152EW+14 TO 152EW+71	SF		.		.
	511.1300 TEMPORARY					
0830	SHORING (LOCATION) 0014.	273.000				
	802BB+15 TO 802BB+36	SF		.		.
	511.1300 TEMPORARY					
0835	SHORING (LOCATION) 0015.	546.000				
	802BB+16 TO 802BB+58	SF		.		.
	511.1300 TEMPORARY					
0840	SHORING (LOCATION) 0016.	546.000				
	802BB+58 TO 803BB+00	SF		.		.
	511.1300 TEMPORARY					
0845	SHORING (LOCATION) 0017.	273.000				
	802BB+80 TO 803BB+01	SF		.		.
	511.1300 TEMPORARY					
0846	SHORING (LOCATION) 0018.	1,405.000				
	7FCV+83 TO 9FCV+53	SF		.		.
	511.1300 TEMPORARY					
0847	SHORING (LOCATION) 0019.	1,210.000				
	9FCV+21 TO 10FCV+76	SF		.		.
	511.2200 TEMPORARY					
0850	SHORING LEFT IN PLACE	203.000				
	(STRUCTURE) 0002.	SF				
	B-40-789			.		.
	511.2200 TEMPORARY					
0855	SHORING LEFT IN PLACE	1,039.000				
	(STRUCTURE) 0003.	SF				
	R-40-525			.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0860	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0004. R-40-536	2,061.000 SF		.		.
0865	512.0500 PILING STEEL SHEET PERMANENT DELIVERED	10,826.000 SF		.		.
0870	512.0600 PILING STEEL SHEET PERMANENT DRIVEN	10,826.000 SF		.		.
0875	513.2000 RAILING PIPE (STRUCTURE) 0001. B-40-798	LUMP	LUMP			.
0880	513.2000 RAILING PIPE (STRUCTURE) 0002. B-40-864	LUMP	LUMP			.
0885	513.2000 RAILING PIPE (STRUCTURE) 0003. R-40-504	LUMP	LUMP			.
0890	513.2000 RAILING PIPE (STRUCTURE) 0004. R-40-524	LUMP	LUMP			.
0895	513.2000 RAILING PIPE (STRUCTURE) 0005. R-40-525	LUMP	LUMP			.
0900	513.2000 RAILING PIPE (STRUCTURE) 0006. R-40-546	LUMP	LUMP			.
0905	513.2000 RAILING PIPE (STRUCTURE) 0007. R-40-548	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0910	513.2000 RAILING PIPE (STRUCTURE) 0008. R-40-554	LUMP	LUMP			.
0915	513.2000 RAILING PIPE (STRUCTURE) 0009. R-40-555	LUMP	LUMP			.
0920	513.2000 RAILING PIPE (STRUCTURE) 0010. R-40-556	LUMP	LUMP			.
0925	513.2000 RAILING PIPE (STRUCTURE) 0011. R-40-557	LUMP	LUMP			.
0930	513.2000 RAILING PIPE (STRUCTURE) 0013. R-40-560	LUMP	LUMP			.
0935	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0001. R-40-618	LUMP	LUMP			.
0940	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0002. R-40-619	LUMP	LUMP			.
0945	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0003. R-40-620	LUMP	LUMP			.
0950	514.0445 FLOOR DRAINS TYPE GC	1.000 EACH	.			.
0955	514.0450 FLOOR DRAINS TYPE WF	4.000 EACH	.			.
0960	514.2608 DOWNSPOUT 8-INCH **P**	566.000 LF	.			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0965	514.2625 DOWNSPOUT 6-INCH **P**	50.000 LF		.		.
0970	516.0100 DAMPPROOFING **P**	6,358.000 SY		.		.
0975	516.0500 RUBBERIZED MEMBRANE WATERPROOFING **P**	2,418.000 SY		.		.
0980	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0001. B-40-852	LUMP	LUMP			.
0985	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0002. B-40-891	LUMP	LUMP			.
0990	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0003. R-40-546	LUMP	LUMP			.
0995	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0004. R-40-548	LUMP	LUMP			.
1000	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0005. R-40-554	LUMP	LUMP			.
1005	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0006. R-40-555	LUMP	LUMP			.
1010	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0007. R-40-560	LUMP	LUMP			.
1015	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0008. R-40-618	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1020	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0009. R-40-619	LUMP	LUMP			.
1025	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0010. R-40-620	LUMP	LUMP			.
1030	517.1010.S CONCRETE STAINING (STRUCTURE) 0001. B-40-785 **P**	12,742.000 SF		.		.
1035	517.1010.S CONCRETE STAINING (STRUCTURE) 0002. R-40-554 **P**	15,998.000 SF		.		.
1040	517.1010.S CONCRETE STAINING (STRUCTURE) 0003. R-40-555 **P**	25,452.000 SF		.		.
1045	517.1010.S CONCRETE STAINING (STRUCTURE) 0004. R-40-560 **P**	10,480.000 SF		.		.
1050	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0001. R-40-501 **P**	889.000 SF		.		.
1055	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0002. R-40-504 **P**	20,783.000 SF		.		.
1060	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0003. R-40-511 **P**	37,391.000 SF		.		.
1065	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0004. R-40-514 **P**	8,550.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1070	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0005. R-40-522 **P**	1,875.000 SF		.		.
1075	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0006. R-40-523 **P**	560.000 SF		.		.
1080	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0007. R-40-524 **P**	3,500.000 SF		.		.
1085	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0008. R-40-525 **P**	26,046.000 SF		.		.
1090	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0009. R-40-536 **P**	17,126.000 SF		.		.
1095	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0010. R-40-546 **P**	35,235.000 SF		.		.
1100	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0011. R-40-548 **P**	32,035.000 SF		.		.
1105	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0012. R-40-551 **P**	12,260.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1110	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0013. R-40-552 **P**	26,485.000 SF		.		.
1115	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0014. R-40-554 **P**	3,569.000 SF		.		.
1120	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0015. R-40-555 **P**	2,089.000 SF		.		.
1125	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0016. R-40-556 **P**	17,035.000 SF		.		.
1130	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0017. R-40-557 **P**	15,815.000 SF		.		.
1135	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0018. R-40-560 **P**	9,690.000 SF		.		.
1140	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0019. R-40-618 **P**	809.000 SF		.		.
1145	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0020. R-40-619 **P**	1,061.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1150	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0021. R-40-620 **P**	1,304.000 SF		.		.
1155	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0022. MINOR RETAINING WALL R-1 **P**	1,150.000 SF		.		.
1160	520.8000 CONCRETE COLLARS FOR PIPE	130.000 EACH		.		.
1165	522.1012 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 12-INCH	4.000 EACH		.		.
1170	522.1015 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 15-INCH	1.000 EACH		.		.
1175	522.1018 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 18-INCH	3.000 EACH		.		.
1180	522.1024 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 24-INCH	6.000 EACH		.		.
1185	522.1036 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 36-INCH	2.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1190	523.0558 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL 58X91-INCH	1.000 EACH		.		.
1195	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0001. N-40-62 **P**	13,870.000 SF		.		.
1200	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0002. N-40-68 **P**	20,600.000 SF		.		.
1205	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0003. N-40-69 **P**	58,270.000 SF		.		.
1210	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0004. N-40-70 **P**	9,670.000 SF		.		.
1215	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0005. N-40-71 **P**	15,170.000 SF		.		.
1220	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0006. N-40-72 **P**	19,220.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1225	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0007. N-40-73 **P**	17,090.000 SF		.		.
1230	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0008. N-40-74 **P**	6,600.000 SF		.		.
1235	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0009. N-40-75 **P**	14,250.000 SF		.		.
1240	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0010. N-40-80 **P**	14,930.000 SF		.		.
1245	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0011. N-40-81 **P**	11,080.000 SF		.		.
1250	550.0010 PRE-BORING UNCONSOLIDATED MATERIALS	25.000 LF		.		.
1255	550.0500 PILE POINTS	482.000 EACH		.		.
1260	550.1100 PILING STEEL HP 10-INCH X 42 LB	2,340.000 LF		.		.

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1265	550.1120 PILING STEEL HP 12-INCH X 53 LB	17,175.000 LF		.		.
1270	550.1140 PILING STEEL HP 14-INCH X 73 LB	8,645.000 LF		.		.
1275	550.2146 PILING CIP CONCRETE 14 X 0.375-INCH	12,259.000 LF		.		.
1280	550.2148 PILING CIP CONCRETE 14 X 0.50-INCH	4,559.000 LF		.		.
1285	550.2168 PILING CIP CONCRETE 16 X 0.50-INCH	1,875.000 LF		.		.
1290	601.0319 CONCRETE CURB & GUTTER 19-INCH **P**	1,072.000 LF		.		.
1295	601.0331 CONCRETE CURB & GUTTER 31-INCH **P**	28,199.000 LF		.		.
1300	601.0551 CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE A **P**	1,798.000 LF		.		.
1305	601.0600 CONCRETE CURB PEDESTRIAN **P**	878.000 LF		.		.
1310	602.0410 CONCRETE SIDEWALK 5-INCH **P**	96,243.000 SF		.		.
1315	602.0515 CURB RAMP DETECTABLE WARNING FIELD NATURAL PATINA	1,112.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1320	602.1500 CONCRETE STEPS	209.000 SF	.		.	
1325	603.1132 CONCRETE BARRIER TYPE S32	2,820.000 LF	.		.	
1330	603.1142 CONCRETE BARRIER TYPE S42	39,927.000 LF	.		.	
1335	603.1156 CONCRETE BARRIER TYPE S56	2,356.000 LF	.		.	
1340	603.1332 CONCRETE BARRIER TYPE S32B	32.000 LF	.		.	
1345	603.1342 CONCRETE BARRIER TYPE S42B	88.000 LF	.		.	
1350	603.1436 CONCRETE BARRIER TYPE S36C	222.000 LF	.		.	
1355	603.1442 CONCRETE BARRIER TYPE S42C	504.000 LF	.		.	
1360	603.3111 CONCRETE BARRIER TRANSITION TYPE NJ32SF TO S32	1.000 EACH	.		.	
1365	603.3211 CONCRETE BARRIER TRANSITION TYPE F32SF TO S32	11.000 EACH	.		.	
1370	603.3513 CONCRETE BARRIER TRANSITION TYPE S32 TO S36	14.000 EACH	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1375	603.3535 CONCRETE BARRIER TRANSITION TYPE S36 TO S42	7.000 EACH		.		.
1380	603.3559 CONCRETE BARRIER TRANSITION TYPE S42 TO S56	9.000 EACH		.		.
1385	603.8000 CONCRETE BARRIER TEMPORARY PRECAST DELIVERED	77,323.000 LF		.		.
1390	603.8125 CONCRETE BARRIER TEMPORARY PRECAST INSTALLED	140,260.000 LF		.		.
1395	604.0400 SLOPE PAVING CONCRETE **P**	414.000 SY		.		.
1400	604.0500 SLOPE PAVING CRUSHED AGGREGATE **P**	1,602.000 SY		.		.
1405	606.0200 RIPRAP MEDIUM	267.000 CY		.		.
1410	607.0600.S STORM SEWER PIPE (INCH) 0001. 10-INCH	11.000 LF		.		.
1415	608.0312 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 12-INCH	2,301.000 LF		.		.
1420	608.0315 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 15-INCH	2,768.000 LF		.		.
1425	608.0318 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 18-INCH	4,915.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	608.0324 STORM SEWER					
1430	PIPE REINFORCED CONCRETE CLASS III 24-INCH	21,214.000 LF		.		.
	608.0330 STORM SEWER					
1435	PIPE REINFORCED CONCRETE CLASS III 30-INCH	1,843.000 LF		.		.
	608.0336 STORM SEWER					
1440	PIPE REINFORCED CONCRETE CLASS III 36-INCH	1,112.000 LF		.		.
	608.0342 STORM SEWER					
1445	PIPE REINFORCED CONCRETE CLASS III 42-INCH	173.000 LF		.		.
	608.0348 STORM SEWER					
1450	PIPE REINFORCED CONCRETE CLASS III 48-INCH	2,250.000 LF		.		.
	608.0354 STORM SEWER					
1455	PIPE REINFORCED CONCRETE CLASS III 54-INCH	1,532.000 LF		.		.
	608.0360 STORM SEWER					
1460	PIPE REINFORCED CONCRETE CLASS III 60-INCH	1,275.000 LF		.		.
	608.0366 STORM SEWER					
1465	PIPE REINFORCED CONCRETE CLASS III 66-INCH	990.000 LF		.		.
	608.0372 STORM SEWER					
1470	PIPE REINFORCED CONCRETE CLASS III 72-INCH	1,902.000 LF		.		.
	608.0396 STORM SEWER					
1475	PIPE REINFORCED CONCRETE CLASS III 96-INCH	16.000 LF		.		.
	608.0412 STORM SEWER					
1480	PIPE REINFORCED CONCRETE CLASS IV 12-INCH	654.000 LF		.		.

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	608.0415 STORM SEWER					
1485	PIPE REINFORCED CONCRETE CLASS IV 15-INCH	378.000 LF		.		.
	608.0418 STORM SEWER					
1490	PIPE REINFORCED CONCRETE CLASS IV 18-INCH	456.000 LF		.		.
	608.0424 STORM SEWER					
1495	PIPE REINFORCED CONCRETE CLASS IV 24-INCH	2,947.000 LF		.		.
	608.0430 STORM SEWER					
1500	PIPE REINFORCED CONCRETE CLASS IV 30-INCH	1,089.000 LF		.		.
	608.0436 STORM SEWER					
1505	PIPE REINFORCED CONCRETE CLASS IV 36-INCH	475.000 LF		.		.
	608.0448 STORM SEWER					
1510	PIPE REINFORCED CONCRETE CLASS IV 48-INCH	2,175.000 LF		.		.
	608.0454 STORM SEWER					
1515	PIPE REINFORCED CONCRETE CLASS IV 54-INCH	655.000 LF		.		.
	608.0466 STORM SEWER					
1520	PIPE REINFORCED CONCRETE CLASS IV 66-INCH	426.000 LF		.		.
	608.0472 STORM SEWER					
1525	PIPE REINFORCED CONCRETE CLASS IV 72-INCH	101.000 LF		.		.
	608.0478 STORM SEWER					
1530	PIPE REINFORCED CONCRETE CLASS IV 78-INCH	461.000 LF		.		.
	608.0515 STORM SEWER					
1535	PIPE REINFORCED CONCRETE CLASS V 15-INCH	19.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	608.0518 STORM SEWER					
1540	PIPE REINFORCED CONCRETE CLASS V 18-INCH	144.000 LF		.		.
	608.0524 STORM SEWER					
1545	PIPE REINFORCED CONCRETE CLASS V 24-INCH	408.000 LF		.		.
	608.0530 STORM SEWER					
1550	PIPE REINFORCED CONCRETE CLASS V 30-INCH	35.000 LF		.		.
	608.0536 STORM SEWER					
1555	PIPE REINFORCED CONCRETE CLASS V 36-INCH	54.000 LF		.		.
	608.0572 STORM SEWER					
1560	PIPE REINFORCED CONCRETE CLASS V 72-INCH	287.000 LF		.		.
	610.0158 STORM SEWER					
1565	PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III 58X91-INCH	594.000 LF		.		.
	611.0420 RECONSTRUCTING					
1570	MANHOLES	6.000 EACH		.		.
	611.0430 RECONSTRUCTING					
1575	INLETS	10.000 EACH		.		.
	611.0535 MANHOLE COVERS					
1580	TYPE J-SPECIAL	102.000 EACH		.		.
	611.0600 INLET COVERS					
1585	TYPE A	7.000 EACH		.		.

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1590	611.0606 INLET COVERS TYPE B	8.000 EACH	.		.	
1595	611.0624 INLET COVERS TYPE H	167.000 EACH	.		.	
1600	611.0627 INLET COVERS TYPE HM	9.000 EACH	.		.	
1605	611.0642 INLET COVERS TYPE MS	85.000 EACH	.		.	
1610	611.0654 INLET COVERS TYPE V	308.000 EACH	.		.	
1615	611.0663 INLET COVERS TYPE X	40.000 EACH	.		.	
1620	611.0666 INLET COVERS TYPE Z	3.000 EACH	.		.	
1625	611.1004 CATCH BASINS 4-FT DIAMETER	64.000 EACH	.		.	
1630	611.1005 CATCH BASINS 5-FT DIAMETER	6.000 EACH	.		.	
1635	611.1006 CATCH BASINS 6-FT DIAMETER	3.000 EACH	.		.	
1640	611.1230 CATCH BASINS 2X3-FT	26.000 EACH	.		.	

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1645	611.2003 MANHOLES 3-FT DIAMETER	4.000 EACH		.		.
1650	611.2004 MANHOLES 4-FT DIAMETER	42.000 EACH		.		.
1655	611.2005 MANHOLES 5-FT DIAMETER	132.000 EACH		.		.
1660	611.2006 MANHOLES 6-FT DIAMETER	40.000 EACH		.		.
1665	611.2007 MANHOLES 7-FT DIAMETER	28.000 EACH		.		.
1670	611.2008 MANHOLES 8-FT DIAMETER	26.000 EACH		.		.
1675	611.3003 INLETS 3-FT DIAMETER	12.000 EACH		.		.
1680	611.3004 INLETS 4-FT DIAMETER	338.000 EACH		.		.
1685	611.3220 INLETS 2X2-FT	7.000 EACH		.		.
1690	611.3225 INLETS 2X2.5-FT	31.000 EACH		.		.
1695	611.3901 INLETS MEDIAN 1 GRATE	27.000 EACH		.		.

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1700	611.3902 INLETS MEDIAN 2 GRATE	29.000 EACH		.		.
1705	611.8110 ADJUSTING MANHOLE COVERS	32.000 EACH		.		.
1710	611.8115 ADJUSTING INLET COVERS	19.000 EACH		.		.
1715	611.8120.S COVER PLATES TEMPORARY	68.000 EACH		.		.
1720	611.9800.S PIPE GRATES	17.000 EACH		.		.
1725	612.0104 PIPE UNDERDRAIN 4-INCH	137.000 LF		.		.
1730	612.0106 PIPE UNDERDRAIN 6-INCH	1,211.000 LF		.		.
1735	612.0206 PIPE UNDERDRAIN UNPERFORATED 6-INCH	1,336.000 LF		.		.
1740	612.0406 PIPE UNDERDRAIN WRAPPED 6-INCH	12,883.000 LF		.		.
1745	612.0806 APRON ENDWALLS FOR UNDERDRAIN REINFORCED CONCRETE 6-INCH	4.000 EACH		.		.

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1750	612.0902.S INSULATION BOARD POLYSTYRENE (INCH) 0001. 4-INCH	35.000 SY		.		.
1755	614.0805 CRASH CUSHIONS PERMANENT LOW MAINTENANCE	11.000 EACH		.		.
1760	614.0905 CRASH CUSHIONS TEMPORARY	61.000 EACH		.		.
1765	614.2300 MGS GUARDRAIL 3	660.000 LF		.		.
1770	614.2500 MGS THRIE BEAM TRANSITION	234.000 LF		.		.
1775	614.2610 MGS GUARDRAIL TERMINAL EAT	7.000 EACH		.		.
1780	614.2620 MGS GUARDRAIL TERMINAL TYPE 2	1.000 EACH		.		.
1785	616.0206 FENCE CHAIN LINK 6-FT	7,612.000 LF		.		.
1790	616.0208 FENCE CHAIN LINK 8-FT	2,346.000 LF		.		.
1795	616.0329 GATES CHAIN LINK (WIDTH) 0001. 8-FT	1.000 EACH		.		.
1800	616.0329 GATES CHAIN LINK (WIDTH) 0002. 12-FT	2.000 EACH		.		.

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1805	616.0406 FENCE CHAIN LINK SALVAGED 6-FT	157.000 LF		.		.
1810	616.0700.S FENCE SAFETY	2,500.000 LF		.		.
1815	619.1000 MOBILIZATION	1.000 EACH		.		.
1820	620.0300 CONCRETE MEDIAN SLOPED NOSE **P**	1,512.000 SF		.		.
1825	623.0200 DUST CONTROL SURFACE TREATMENT	561,365.000 SY		.		.
1830	624.0100 WATER	4,534.000 MGAL		.		.
1835	628.1104 EROSION BALES	997.000 EACH		.		.
1840	628.1504 SILT FENCE	25,865.000 LF		.		.
1845	628.1520 SILT FENCE MAINTENANCE	25,865.000 LF		.		.
1850	628.1905 MOBILIZATIONS EROSION CONTROL	40.000 EACH		.		.
1855	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL	20.000 EACH		.		.

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1860	628.2004 EROSION MAT CLASS I TYPE B	332,795.000 SY		.		.
1865	628.2021 EROSION MAT CLASS II TYPE A	245.000 SY		.		.
1870	628.2023 EROSION MAT CLASS II TYPE B	134,805.000 SY		.		.
1875	628.6510 SOIL STABILIZER TYPE B	3.200 ACRE		.		.
1880	628.7005 INLET PROTECTION TYPE A	1,442.000 EACH		.		.
1885	628.7010 INLET PROTECTION TYPE B	414.000 EACH		.		.
1890	628.7015 INLET PROTECTION TYPE C	672.000 EACH		.		.
1895	628.7020 INLET PROTECTION TYPE D	1,682.000 EACH		.		.
1900	628.7504 TEMPORARY DITCH CHECKS	3,640.000 LF		.		.
1905	628.7555 CULVERT PIPE CHECKS	11.000 EACH		.		.
1910	628.7560 TRACKING PADS	33.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1915	628.7570 ROCK BAGS	250.000 EACH		.		.
1920	629.0210 FERTILIZER TYPE B	216.700 CWT		.		.
1925	630.0130 SEEDING MIXTURE NO. 30	3,997.000 LB		.		.
1930	630.0180 SEEDING MIXTURE NO. 80	768.000 LB		.		.
1935	630.0200 SEEDING TEMPORARY	4,439.000 LB		.		.
1940	630.0400 SEEDING NURSE CROP	1,012.000 LB		.		.
1945	631.0300 SOD WATER	413.700 MGAL		.		.
1950	631.1000 SOD LAWN	18,416.000 SY		.		.
1955	632.0101 TREES (SPECIES, ROOT, SIZE) 0001. COFFEETREE KENTUCKY B&B 2 1/2-INCH CAL	2.000 EACH		.		.
1960	632.0101 TREES (SPECIES, ROOT, SIZE) 0003. HACKBERRY COMMON B&B 2 1/2-INCH CAL	2.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1965	632.0101 TREES (SPECIES, ROOT, SIZE) 0005. MAPLE FREEMAN ARMSTRONG B&B 2 1-2-INCH CAL	4.000 EACH		.		.
1970	632.0101 TREES (SPECIES, ROOT, SIZE) 0007. MAPLE MORTON MIYABE B&B 2 1/2-INCH CAL	3.000 EACH		.		.
1975	632.0101 TREES (SPECIES, ROOT, SIZE) 0009. OAK SWAMP WHITE B&B 2 1/2-INCH CAL	4.000 EACH		.		.
1980	632.0101 TREES (SPECIES, ROOT, SIZE) 0011. OAK BUR B&B 2 1/2-INCH CAL	3.000 EACH		.		.
1985	632.0101 TREES (SPECIES, ROOT, SIZE) 0013. CRABAPPLE PRAIRIFIRE B&B 2-INCH CAL	5.000 EACH		.		.
1990	632.0101 TREES (SPECIES, ROOT, SIZE) 0015. CRABAPPLE RED BARON B&B 2-INCH CAL	6.000 EACH		.		.
1995	632.0101 TREES (SPECIES, ROOT, SIZE) 0017. HAWTHORN THORNLESS COCKSPUR B&B 2-INCH CAL	3.000 EACH		.		.
2000	632.0101 TREES (SPECIES, ROOT, SIZE) 0019. REDCEDAR EASTERN B&B 5-FOOT HT	7.000 EACH		.		.
2005	632.0101 TREES (SPECIES, ROOT, SIZE) 0021. SPRUCE COLORADO GREEN B&B 5-FOOT	15.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2010	632.0101 TREES (SPECIES, ROOT, SIZE) 0023. SPRUCE HOOPS BLUE COLORADO B&B 5-FOOT HT	6.000 EACH		.		.
2015	632.0201 SHRUBS (SPECIES, ROOT, SIZE) 0025. DOGWOOD CORNELIANCHERRY B&B 6-FOOT HT	14.000 EACH		.		.
2020	632.0201 SHRUBS (SPECIES, ROOT, SIZE) 0027. VIBURNUM LITTLE JOE 24-INCH CG	36.000 EACH		.		.
2025	632.9101 LANDSCAPE PLANTING SURVEILLANCE AND CARE CYCLES	24.000 EACH		.		.
2030	633.0500 DELINEATOR REFLECTORS	424.000 EACH		.		.
2035	633.1000 DELINEATOR BRACKETS	424.000 EACH		.		.
2040	633.5200 MARKERS CULVERT END	17.000 EACH		.		.
2045	634.0618 POSTS WOOD 4X6-INCH X 18-FT	144.000 EACH		.		.
2050	634.0620 POSTS WOOD 4X6-INCH X 20-FT	8.000 EACH		.		.
2055	634.0622 POSTS WOOD 4X6-INCH X 22-FT	60.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2060	634.0816 POSTS TUBULAR STEEL 2X2-INCH X 16-FT	155.000 EACH		.		.
2065	634.0885 POSTS TUBULAR STEEL 2X2-INCH X 8.5-FT	88.000 EACH		.		.
2070	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS	11,200.000 LB		.		.
2075	635.0300 SIGN SUPPORTS REPLACING BASE CONNECTION BOLTS	2.000 EACH		.		.
2080	636.0100 SIGN SUPPORTS CONCRETE MASONRY **P**	1,341.700 CY		.		.
2085	636.0500 SIGN SUPPORTS STEEL REINFORCEMENT	1,206.000 LB		.		.
2090	636.1000 SIGN SUPPORTS STEEL REINFORCEMENT HS	115,325.000 LB		.		.
2095	636.1500 SIGN SUPPORTS STEEL COATED REINFORCEMENT HS	189,375.000 LB		.		.
2100	637.1210 SIGNS TYPE I REFLECTIVE H	2,538.000 SF		.		.
2105	637.1220 SIGNS TYPE I REFLECTIVE SH	14,265.000 SF		.		.
2110	637.1230 SIGNS TYPE I REFLECTIVE F	202.500 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	637.2210 SIGNS TYPE II					
2115	REFLECTIVE H	2,850.130				
		SF		.		.
	637.2215 SIGNS TYPE II					
2120	REFLECTIVE H FOLDING	144.600				
		SF		.		.
	637.2230 SIGNS TYPE II					
2125	REFLECTIVE F	1,060.000				
		SF		.		.
	638.2101 MOVING SIGNS					
2130	TYPE I	4.000				
		EACH		.		.
	638.2102 MOVING SIGNS					
2135	TYPE II	110.000				
		EACH		.		.
	638.2601 REMOVING SIGNS					
2140	TYPE I	60.000				
		EACH		.		.
	638.2602 REMOVING SIGNS					
2145	TYPE II	593.000				
		EACH		.		.
	638.3000 REMOVING SMALL					
2150	SIGN SUPPORTS	350.000				
		EACH		.		.
	638.3100 REMOVING					
2155	STRUCTURAL STEEL SIGN	55.000				
	SUPPORTS	EACH		.		.
	641.0100 SIGN BRIDGE					
2160	SINGLE POLE SIGN SUPPORT	LUMP	LUMP			
	ONE SIGN (STRUCTURE)					
	0001. S-40-788					.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	641.0100 SIGN BRIDGE					
2165	SINGLE POLE SIGN SUPPORT ONE SIGN (STRUCTURE) 0002. S-40-789	LUMP	LUMP			.
	641.0600 SIGN BRIDGE					
2170	SINGLE POLE SIGN SUPPORT TWO SIGNS (STRUCTURE) 0001. S-40-790	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2175	CANTILEVERED (STRUCTURE) 0001. S-40-28	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2180	CANTILEVERED (STRUCTURE) 0002. S-40-65	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2185	CANTILEVERED (STRUCTURE) 0003. S-40-85	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2190	CANTILEVERED (STRUCTURE) 0004. S-40-118	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2195	CANTILEVERED (STRUCTURE) 0005. S-40-119	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2200	CANTILEVERED (STRUCTURE) 0006. S-40-124	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2205	CANTILEVERED (STRUCTURE) 0007. S-40-129	LUMP	LUMP			.
	641.1200 SIGN BRIDGE					
2210	CANTILEVERED (STRUCTURE) 0008. S-40-130	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2215	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0009. S-40-131	LUMP	LUMP			.
2220	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0010. S-40-134	LUMP	LUMP			.
2225	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0011. S-40-137	LUMP	LUMP			.
2230	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0012. S-40-146	LUMP	LUMP			.
2235	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0013. S-40-158	LUMP	LUMP			.
2240	641.6600 SIGN BRIDGE (STRUCTURE) 0001. S-40-22	LUMP	LUMP			.
2245	641.6600 SIGN BRIDGE (STRUCTURE) 0002. S-40-27	LUMP	LUMP			.
2250	641.6600 SIGN BRIDGE (STRUCTURE) 0003. S-40-43	LUMP	LUMP			.
2255	641.6600 SIGN BRIDGE (STRUCTURE) 0004. S-40-44	LUMP	LUMP			.
2260	641.6600 SIGN BRIDGE (STRUCTURE) 0005. S-40-47	LUMP	LUMP			.
2265	641.6600 SIGN BRIDGE (STRUCTURE) 0006. S-40-50	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2270	641.6600 SIGN BRIDGE (STRUCTURE) 0007. S-40-51	LUMP	LUMP			.
2275	641.6600 SIGN BRIDGE (STRUCTURE) 0008. S-40-87	LUMP	LUMP			.
2280	641.6600 SIGN BRIDGE (STRUCTURE) 0009. S-40-104	LUMP	LUMP			.
2285	641.6600 SIGN BRIDGE (STRUCTURE) 0010. S-40-116	LUMP	LUMP			.
2290	641.6600 SIGN BRIDGE (STRUCTURE) 0011. S-40-117	LUMP	LUMP			.
2295	641.6600 SIGN BRIDGE (STRUCTURE) 0012. S-40-121	LUMP	LUMP			.
2300	641.6600 SIGN BRIDGE (STRUCTURE) 0013. S-40-122	LUMP	LUMP			.
2305	641.6600 SIGN BRIDGE (STRUCTURE) 0014. S-40-132	LUMP	LUMP			.
2310	641.6600 SIGN BRIDGE (STRUCTURE) 0015. S-40-135	LUMP	LUMP			.
2315	641.6600 SIGN BRIDGE (STRUCTURE) 0016. S-40-136	LUMP	LUMP			.
2320	641.6600 SIGN BRIDGE (STRUCTURE) 0017. S-40-443	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2325	641.6600 SIGN BRIDGE (STRUCTURE) 0018. S-40-444	LUMP	LUMP			.
2330	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0001. S-40-991	LUMP	LUMP			.
2335	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0002. S-40-992	LUMP	LUMP			.
2340	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0003. S-40-993	LUMP	LUMP			.
2345	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0004. S-40-989	LUMP	LUMP			.
2350	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0005. S-40-147	LUMP	LUMP			.
2355	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0006. S-40-148	LUMP	LUMP			.
2360	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0007. S-40-149	LUMP	LUMP			.
2365	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0008. S-40-995	LUMP	LUMP			.
2370	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0009. S-40-996	LUMP	LUMP			.
2375	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0010. S-40-971	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2380	643.0200 TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE (PROJECT) 0001. 1060-33-80	636.000 DAY		.		.
2385	643.0300 TRAFFIC CONTROL DRUMS	482,182.000 DAY		.		.
2390	643.0410 TRAFFIC CONTROL BARRICADES TYPE II	6,814.000 DAY		.		.
2395	643.0420 TRAFFIC CONTROL BARRICADES TYPE III	65,009.000 DAY		.		.
2400	643.0500 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER POSTS	391.000 EACH		.		.
2405	643.0600 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER BASES	391.000 EACH		.		.
2410	643.0705 TRAFFIC CONTROL WARNING LIGHTS TYPE A	129,993.000 DAY		.		.
2415	643.0715 TRAFFIC CONTROL WARNING LIGHTS TYPE C	85,856.000 DAY		.		.
2420	643.0800 TRAFFIC CONTROL ARROW BOARDS	3,958.000 DAY		.		.
2425	643.0900 TRAFFIC CONTROL SIGNS	239,804.000 DAY		.		.
2430	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I	92.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2435	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II	254.000 EACH		.		.
2440	643.1000 TRAFFIC CONTROL SIGNS FIXED MESSAGE	3,649.750 SF		.		.
2445	643.1050 TRAFFIC CONTROL SIGNS PCMS	5,139.000 DAY		.		.
2450	643.2000 TRAFFIC CONTROL DETOUR (PROJECT) 0001. 1060-33-80	1.000 EACH		.		.
2455	643.3000 TRAFFIC CONTROL DETOUR SIGNS	635,043.000 DAY		.		.
2460	645.0111 GEOTEXTILE FABRIC TYPE DF SCHEDULE A **P**	544.000 SY		.		.
2465	645.0112 GEOTEXTILE FABRIC TYPE DF SCHEDULE B **P**	1,332.000 SY		.		.
2470	645.0120 GEOTEXTILE FABRIC TYPE HR **P**	340.000 SY		.		.
2475	645.0130 GEOTEXTILE FABRIC TYPE R **P**	3,439.000 SY		.		.
2480	645.0140 GEOTEXTILE FABRIC TYPE SAS **P**	15,615.000 SY		.		.
2485	646.0106 PAVEMENT MARKING EPOXY 4-INCH	249,280.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2490	646.0126 PAVEMENT MARKING EPOXY 8-INCH	20,133.000 LF		.		.
2495	646.0600 REMOVING PAVEMENT MARKINGS	97,838.000 LF		.		.
2500	646.0841.S PAVEMENT MARKING GROOVED WET REFLECTIVE CONTRAST TAPE 4-INCH **P**	13,131.000 LF		.		.
2505	646.0843.S PAVEMENT MARKING GROOVED WET REFLECTIVE CONTRAST TAPE 8-INCH **P**	16,747.000 LF		.		.
2510	646.0883.S PAVEMENT MARKING GROOVED WET REFLECTIVE TAPE 8-INCH **P**	824.000 LF		.		.
2515	647.0196 PAVEMENT MARKING ARROWS EPOXY TYPE 5	4.000 EACH		.		.
2520	647.0456 PAVEMENT MARKING CURB EPOXY	617.000 LF		.		.
2525	647.0566 PAVEMENT MARKING STOP LINE EPOXY 18-INCH	200.000 LF		.		.
2530	647.0606 PAVEMENT MARKING ISLAND NOSE EPOXY	16.000 EACH		.		.
2535	647.0656 PAVEMENT MARKING PARKING STALL EPOXY	666.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2540	647.0726 PAVEMENT MARKING DIAGONAL EPOXY 12-INCH	3,688.000 LF		.		.
2545	647.0746 PAVEMENT MARKING DIAGONAL EPOXY 24-INCH	3,416.000 LF		.		.
2550	647.0955 REMOVING PAVEMENT MARKINGS ARROWS	6.000 EACH		.		.
2555	649.0100 TEMPORARY PAVEMENT MARKING 4-INCH	14,400.000 LF		.		.
2560	649.0200 TEMPORARY PAVEMENT MARKING REFLECTIVE PAINT 4-INCH	106,472.000 LF		.		.
2565	649.0400 TEMPORARY PAVEMENT MARKING REMOVABLE TAPE 4-INCH	115,784.000 LF		.		.
2570	649.0701 TEMPORARY PAVEMENT MARKING 8-INCH	2,581.000 LF		.		.
2575	649.0801 TEMPORARY PAVEMENT MARKING REMOVABLE TAPE 8-INCH	17,588.000 LF		.		.
2580	649.2100 TEMPORARY RAISED PAVEMENT MARKERS	120.000 EACH		.		.
2585	652.0125 CONDUIT RIGID METALLIC 2-INCH	1,173.000 LF		.		.
2590	652.0130 CONDUIT RIGID METALLIC 2 1/2-INCH	12.000 LF		.		.

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2595	652.0135 CONDUIT RIGID METALLIC 3-INCH	6.000 LF		.		.
2600	652.0210 CONDUIT RIGID NONMETALLIC SCHEDULE 40 1-INCH	266.000 LF		.		.
2605	652.0225 CONDUIT RIGID NONMETALLIC SCHEDULE 40 2-INCH	45,173.000 LF		.		.
2610	652.0230 CONDUIT RIGID NONMETALLIC SCHEDULE 40 2 1/2-INCH	928.000 LF		.		.
2615	652.0235 CONDUIT RIGID NONMETALLIC SCHEDULE 40 3-INCH	36,232.000 LF		.		.
2620	652.0325 CONDUIT RIGID NONMETALLIC SCHEDULE 80 2-INCH	8,926.000 LF		.		.
2625	652.0605 CONDUIT SPECIAL 2-INCH	5,678.000 LF		.		.
2630	652.0615 CONDUIT SPECIAL 3-INCH	1,065.000 LF		.		.
2635	652.0700.S INSTALL CONDUIT INTO EXISTING ITEM	17.000 EACH		.		.
2640	652.0800 CONDUIT LOOP DETECTOR	8,761.000 LF		.		.
2645	653.0105 PULL BOXES STEEL 12X24-INCH	12.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	653.0135 PULL BOXES					
2650	STEEL 24X36-INCH	68.000				
		EACH		.		.
	653.0140 PULL BOXES					
2655	STEEL 24X42-INCH	144.000				
		EACH		.		.
	653.0220 JUNCTION BOXES					
2660	18X6X6-INCH	16.000				
		EACH		.		.
	653.0222 JUNCTION BOXES					
2665	18X12X6-INCH	63.000				
		EACH		.		.
	653.0905 REMOVING PULL					
2670	BOXES	116.000				
		EACH		.		.
	654.0101 CONCRETE BASES					
2675	TYPE 1	41.000				
		EACH		.		.
	654.0102 CONCRETE BASES					
2680	TYPE 2	5.000				
		EACH		.		.
	654.0105 CONCRETE BASES					
2685	TYPE 5	118.000				
		EACH		.		.
	654.0110 CONCRETE BASES					
2690	TYPE 10	8.000				
		EACH		.		.
	654.0113 CONCRETE BASES					
2695	TYPE 13	8.000				
		EACH		.		.
	654.0217 CONCRETE					
2700	CONTROL CABINET BASES	3.000				
	TYPE 9 SPECIAL	EACH		.		.

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2705	655.0230 CABLE TRAFFIC SIGNAL 5-14 AWG	4,341.000 LF		.		.
2710	655.0240 CABLE TRAFFIC SIGNAL 7-14 AWG	7,126.000 LF		.		.
2715	655.0250 CABLE TRAFFIC SIGNAL 9-14 AWG	310.000 LF		.		.
2720	655.0255 CABLE TRAFFIC SIGNAL 12-12 AWG	5,354.000 LF		.		.
2725	655.0260 CABLE TRAFFIC SIGNAL 12-14 AWG	5,237.000 LF		.		.
2730	655.0270 CABLE TRAFFIC SIGNAL 15-14 AWG	514.000 LF		.		.
2735	655.0305 CABLE TYPE UF 2-12 AWG GROUNDED	3,360.000 LF		.		.
2740	655.0320 CABLE TYPE UF 2-10 AWG GROUNDED	2,992.000 LF		.		.
2745	655.0505 ELECTRICAL WIRE TRAFFIC SIGNALS 14 AWG	19,670.000 LF		.		.
2750	655.0515 ELECTRICAL WIRE TRAFFIC SIGNALS 10 AWG	10,632.000 LF		.		.
2755	655.0610 ELECTRICAL WIRE LIGHTING 12 AWG	31,519.000 LF		.		.

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2760	655.0615 ELECTRICAL WIRE LIGHTING 10 AWG	954.000 LF		.		.
2765	655.0620 ELECTRICAL WIRE LIGHTING 8 AWG	55,195.000 LF		.		.
2770	655.0625 ELECTRICAL WIRE LIGHTING 6 AWG	143,564.000 LF		.		.
2775	655.0630 ELECTRICAL WIRE LIGHTING 4 AWG	10,616.000 LF		.		.
2780	655.0635 ELECTRICAL WIRE LIGHTING 2 AWG	11,002.000 LF		.		.
2785	655.0640 ELECTRICAL WIRE LIGHTING 1 AWG	210.000 LF		.		.
2790	655.0645 ELECTRICAL WIRE LIGHTING 1/0 AWG	1,962.000 LF		.		.
2795	655.0700 LOOP DETECTOR LEAD IN CABLE	34,500.000 LF		.		.
2800	655.0800 LOOP DETECTOR WIRE	28,120.000 LF		.		.
2805	655.0900 TRAFFIC SIGNAL EVP DETECTOR CABLE	6,020.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2810	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 1100. ATR214EW AND ATR215EW	LUMP	LUMP			.
2815	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2001. CB-SDS-40-0051	LUMP	LUMP			.
2820	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2002. CB-SDS-40-0227	LUMP	LUMP			.
2825	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2003. CB-RM-40-0010	LUMP	LUMP			.
2830	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2004. CB-SDS-40-0228	LUMP	LUMP			.
2835	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2005. CB-RM-40-0009	LUMP	LUMP			.
2840	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 3001. IH 94 RAMPS & STH 181	LUMP	LUMP			.
2845	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 3002. USH 45 RAMPS & USH 18	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2850	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0001. (HL-40-UN)	LUMP	LUMP			.
2855	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0002. (WASHINGTON - WT)	LUMP	LUMP			.
2860	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0003. (HL-40-WB)	LUMP	LUMP			.
2865	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0004. (HL-40-AD)	LUMP	LUMP			.
2870	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0005. (HL-40-DX)	LUMP	LUMP			.
2875	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0006. (HL-40-ZE/QR)	LUMP	LUMP			.
2880	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0007. (HL-40-TA)	LUMP	LUMP			.

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CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2885	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2001. CB-CCTV-40-0099	LUMP	LUMP			.
2890	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2002. CB-SDS-40-0051	LUMP	LUMP			.
2895	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2003. CB-SDS-40-0227	LUMP	LUMP			.
2900	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2004. CB-RM-40-0010	LUMP	LUMP			.
2905	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2005. CB-CCTV-40-0141	LUMP	LUMP			.
2910	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2006. CB-SDS-40-0228	LUMP	LUMP			.
2915	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2007. CB-RM-40-0009	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2920	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2008. CB-DMS-40-0132	LUMP	LUMP			.
2925	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2009. CB-DMS-40-0019	LUMP	LUMP			.
2930	657.0100 PEDESTAL BASES	31.000 EACH	.			.
2935	657.0210 TRANSFORMER BASES BREAKAWAY 15-17 INCH BOLT CIRCLE	16.000 EACH	.			.
2940	657.0255 TRANSFORMER BASES BREAKAWAY 11 1/2-INCH BOLT CIRCLE	115.000 EACH	.			.
2945	657.0305 POLES TYPE 2	3.000 EACH	.			.
2950	657.0310 POLES TYPE 3	2.000 EACH	.			.
2955	657.0322 POLES TYPE 5-ALUMINUM	143.000 EACH	.			.
2960	657.0375 POLES TYPE A	16.000 EACH	.			.
2965	657.0405 TRAFFIC SIGNAL STANDARDS ALUMINUM 3. 5-FT	6.000 EACH	.			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	657.0420 TRAFFIC SIGNAL					
2970	STANDARDS ALUMINUM 13-FT	13.000				
		EACH		.		.
	657.0425 TRAFFIC SIGNAL					
2975	STANDARDS ALUMINUM 15-FT	5.000				
		EACH		.		.
	657.0430 TRAFFIC SIGNAL					
2980	STANDARDS ALUMINUM 10-FT	9.000				
		EACH		.		.
	657.0605 LUMINAIRE ARMS					
2985	SINGLE MEMBER 4 1/2-INCH	28.000				
	CLAMP 4-FT	EACH		.		.
	657.0609 LUMINAIRE ARMS					
2990	SINGLE MEMBER 4-INCH	2.000				
	CLAMP 6-FT	EACH		.		.
	657.0610 LUMINAIRE ARMS					
2995	SINGLE MEMBER 4 1/2-INCH	145.000				
	CLAMP 6-FT	EACH		.		.
	657.0620 LUMINAIRE ARMS					
3000	SINGLE MEMBER 6-INCH	34.000				
	CLAMP 4-FT	EACH		.		.
	657.1345 INSTALL POLES					
3005	TYPE 9	5.000				
		EACH		.		.
	657.1350 INSTALL POLES					
3010	TYPE 10	3.000				
		EACH		.		.
	657.1355 INSTALL POLES					
3015	TYPE 12	8.000				
		EACH		.		.
	657.1515 INSTALL					
3020	MONOTUBE ARMS 15-FT	1.000				
		EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3025	657.1520 INSTALL MONOTUBE ARMS 20-FT	2.000 EACH		.		.
3030	657.1530 INSTALL MONOTUBE ARMS 30-FT	5.000 EACH		.		.
3035	657.1535 INSTALL MONOTUBE ARMS 35-FT	3.000 EACH		.		.
3040	657.1540 INSTALL MONOTUBE ARMS 40-FT	1.000 EACH		.		.
3045	657.1545 INSTALL MONOTUBE ARMS 45-FT	1.000 EACH		.		.
3050	657.1550 INSTALL MONOTUBE ARMS 50-FT	2.000 EACH		.		.
3055	657.1555 INSTALL MONOTUBE ARMS 55-FT	1.000 EACH		.		.
3060	657.1808 INSTALL LUMINAIRE ARMS STEEL 8-FT	3.000 EACH		.		.
3065	657.6005.S ANCHOR ASSEMBLIES LIGHT POLES ON STRUCTURES	43.000 EACH		.		.
3070	658.0110 TRAFFIC SIGNAL FACE 3-12 INCH VERTICAL	64.000 EACH		.		.
3075	658.0115 TRAFFIC SIGNAL FACE 4-12 INCH VERTICAL	9.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3080	658.0215 BACKPLATES SIGNAL FACE 3 SECTION 12-INCH	64.000 EACH		.		.
3085	658.0220 BACKPLATES SIGNAL FACE 4 SECTION 12-INCH	9.000 EACH		.		.
3090	658.0416 PEDESTRIAN SIGNAL FACE 16-INCH	32.000 EACH		.		.
3095	658.0500 PEDESTRIAN PUSH BUTTONS	40.000 EACH		.		.
3100	658.0600 LED MODULES 12-INCH RED BALL	56.000 EACH		.		.
3105	658.0605 LED MODULES 12-INCH YELLOW BALL	54.000 EACH		.		.
3110	658.0610 LED MODULES 12-INCH GREEN BALL	48.000 EACH		.		.
3115	658.0615 LED MODULES 12-INCH RED ARROW	17.000 EACH		.		.
3120	658.0620 LED MODULES 12-INCH YELLOW ARROW	25.000 EACH		.		.
3125	658.0625 LED MODULES 12-INCH GREEN ARROW	28.000 EACH		.		.
3130	658.0635 LED MODULES PEDESTRIAN COUNTDOWN TIMER 16-INCH	32.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3135	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3001. IH 94 RAMPS & STH 181	LUMP	LUMP			.
3140	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3002. USH 45 RAMPS & USH 18	LUMP	LUMP			.
3145	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3003. USH 18 & N. 95TH STREET	LUMP	LUMP			.
3150	659.0802 PLAQUES SEQUENCE IDENTIFICATION	251.000 EACH	.			.
3155	659.1120 LUMINAIRES UTILITY LED B	156.000 EACH	.			.
3160	659.1130 LUMINAIRES UTILITY LED D	76.000 EACH	.			.
3165	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3001. IH 94 EB RAMPS & STH 181	LUMP	LUMP			.
3170	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3002. IH 94 WB RAMPS & STH 181	LUMP	LUMP			.
3171	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3003. IH 94 WB RAMPS & STH 181	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3175	661.0300 GENERATORS	6.000 DAY	.		.	
3180	662.1028.S RAMP CLOSURE GATES HARDWIRED 28-FT	1.000 EACH	.		.	
3185	662.1037.S RAMP CLOSURE GATES HARDWIRED 37-FT	2.000 EACH	.		.	
3190	662.1040.S RAMP CLOSURE GATES HARDWIRED 40-FT	1.000 EACH	.		.	
3195	670.0100 FIELD SYSTEM INTEGRATOR 2001. FTMS	LUMP	LUMP			.
3200	670.0100 FIELD SYSTEM INTEGRATOR 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3205	670.0100 FIELD SYSTEM INTEGRATOR 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3210	670.0200 ITS DOCUMENTATION 2001. FTMS	LUMP	LUMP			.
3215	670.0200 ITS DOCUMENTATION 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3220	670.0200 ITS DOCUMENTATION 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3225	671.0132 CONDUIT HDPE 3-DUCT 2-INCH	4,125.000 LF	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3230	672.0100 BASE ITS CONTROLLER CABINET	3.000 EACH	.		.	
3235	672.0250 BASE CAMERA POLE 50-FT	3.000 EACH	.		.	
3240	672.0280 BASE CAMERA POLE 80-FT	1.000 EACH	.		.	
3245	673.0105 COMMUNICATION VAULT TYPE 1	20.000 EACH	.		.	
3250	673.0200.S INSTALL ITS FIELD CABINET	3.000 EACH	.		.	
3255	673.0225.S INSTALL POLE MOUNTED CABINET	8.000 EACH	.		.	
3260	674.0112 CABLE ITS COMMUNICATION 12 PAIR	874.000 LF	.		.	
3265	674.0125 CABLE ITS COMMUNICATION 25 PAIR	1,249.000 LF	.		.	
3270	674.0200 CABLE MICROWAVE DETECTOR	9,340.000 LF	.		.	
3275	674.0300 REMOVE CABLE	38,930.000 LF	.		.	
3280	675.0100 INSTALL CONTROLLER RAMP METER PROCESSOR ASSEMBLY	3.000 EACH	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3285	675.0300 INSTALL MOUNTED CONTROLLER MICROWAVE DETECTOR ASSEMBLY	17.000 EACH		.		.
3290	675.0400.S INSTALL ETHERNET SWITCH	8.000 EACH		.		.
3295	676.0100 SIGNAL ASSEMBLY RAMP CONTROL SIDEMOUNT	5.000 EACH		.		.
3300	676.0105 SIGNAL ASSEMBLY RAMP CONTROL OVERHEAD	2.000 EACH		.		.
3305	676.0300 SIGNAL ASSEMBLY ADVANCE FLASHER TYPE 1	6.000 EACH		.		.
3310	676.9001.S REMOVING ADVANCE FLASHER ASSEMBLIES TYPE 1	7.000 EACH		.		.
3315	677.0100 INSTALL CAMERA POLE	3.000 EACH		.		.
3320	677.0200 INSTALL CAMERA ASSEMBLY	4.000 EACH		.		.
3325	677.0300.S INSTALL VIDEO ENCODER	4.000 EACH		.		.
3330	677.9051.S REMOVING 50-FOOT CAMERA POLE	3.000 EACH		.		.
3335	677.9200.S REMOVING CCTV CAMERA	3.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3340	678.0006 INSTALL FIBER OPTIC CABLE OUTDOOR PLANT 6-CT	11,775.000 LF		.		.
3345	678.0072 INSTALL FIBER OPTIC CABLE OUTDOOR PLANT 72-CT	10,720.000 LF		.		.
3350	678.0100.S INSTALL OVERHEAD FREEWAY DMS FULL MATRIX	2.000 EACH		.		.
3355	678.0300 FIBER OPTIC SPLICE	423.000 EACH		.		.
3360	678.0400 FIBER OPTIC TERMINATION	76.000 EACH		.		.
3365	678.0500 COMMUNICATION SYSTEM TESTING 2001. FTMS	LUMP	LUMP			.
3370	678.0500 COMMUNICATION SYSTEM TESTING 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3375	678.0500 COMMUNICATION SYSTEM TESTING 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3380	690.0150 SAWING ASPHALT	5,290.000 LF		.		.
3385	690.0250 SAWING CONCRETE	47,211.000 LF		.		.
3390	715.0415 INCENTIVE STRENGTH CONCRETE PAVEMENT	102,710.000 DOL	1.00000		102710.00	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3395	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	182,144.000 DOL	1.00000		182144.00	
3400	ASP.1T0A ON-THE-JOB TRAINING APPRENTICE AT $5.00/HR	22,500.000 HRS	5.00000		112500.00	
3405	ASP.1T0G ON-THE-JOB TRAINING GRADUATE AT $5.00/HR	22,500.000 HRS	5.00000		112500.00	
3410	SPV.0035 SPECIAL 0100. EBS EXCAVATION	46,788.000 CY	.		.	
3415	SPV.0035 SPECIAL 0101. EBS BACKFILL	46,549.000 CY	.		.	
3420	SPV.0035 SPECIAL 0700. EXCAVATION, HAULING, AND REUSE OF SOLID WASTE SOIL	16,574.000 CY	.		.	
3425	SPV.0035 SPECIAL 4000. HPC MASONRY STRUCTURES **P**	11,677.500 CY	.		.	
3430	SPV.0035 SPECIAL 4010. CONCRETE MASONRY SOLDIER PILE FOOTINGS **P**	2,705.000 CY	.		.	
3435	SPV.0035 SPECIAL 4020. LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 1	12,896.000 CY	.		.	
3440	SPV.0035 SPECIAL 4030. LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 2	4,034.000 CY	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0045 SPECIAL 0100.					
3445	TEMPORARY CROSSWALK/SIDEWALK	600.000 DAY		.		.
	SPV.0045 SPECIAL 0400.					
3450	TRUCK OR TRAILER MOUNTED ATTENUATOR	500.000 DAY		.		.
	SPV.0045 SPECIAL 0401.					
3455	PORTABLE SPEED TRAILER	1,926.000 DAY		.		.
	SPV.0045 SPECIAL 2000.					
3460	DYNAMIC LATE MERGE SYSTEM	465.000 DAY		.		.
	SPV.0045 SPECIAL 2001.					
3465	WORK ZONE CONSTRUCTION TRAFFIC MERGE WARNING SYSTEM	932.000 DAY		.		.
	SPV.0060 SPECIAL 0003.					
3470	EXPOSING EXISTING UTILITY UNPAVED AREA	150.000 EACH		.		.
	SPV.0060 SPECIAL 0004.					
3475	EXPOSING EXISTING UTILITY PAVED AREA	150.000 EACH		.		.
	SPV.0060 SPECIAL 0005.					
3480	BASELINE CPM PROGRESS SCHEDULE	1.000 EACH		.		.
	SPV.0060 SPECIAL 0006.					
3485	MONTHLY CPM PROGRESS SCHEDULE UPDATES	20.000 EACH		.		.
	SPV.0060 SPECIAL 0010.					
3490	REMOVING HIGH MAST LIGHTING TOWER CONCRETE BASE	5.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 0011.					
3495	REMOVING HIGH MAST LIGHTING TOWER	3.000 EACH		.		.
	SPV.0060 SPECIAL 0012.					
3500	REMOVING GROUT PIPE	7.000 EACH		.		.
	SPV.0060 SPECIAL 0015.					
3505	REMOVING UTILITY VAULT	26.000 EACH		.		.
	SPV.0060 SPECIAL 0021.					
3510	REMOVING OLD SIGN STRUCTURE S-40-155	1.000 EACH		.		.
	SPV.0060 SPECIAL 0022.					
3515	REMOVING OLD SIGN STRUCTURE S-40-164	1.000 EACH		.		.
	SPV.0060 SPECIAL 0023.					
3520	REMOVING OLD SIGN STRUCTURE S-40-200	1.000 EACH		.		.
	SPV.0060 SPECIAL 0024.					
3525	REMOVING OLD SIGN STRUCTURE S-40-203	1.000 EACH		.		.
	SPV.0060 SPECIAL 0025.					
3530	REMOVING OLD SIGN STRUCTURE S-40-230	1.000 EACH		.		.
	SPV.0060 SPECIAL 0026.					
3535	REMOVING OLD SIGN STRUCTURE S-40-262	1.000 EACH		.		.
	SPV.0060 SPECIAL 0027.					
3540	REMOVING OLD SIGN STRUCTURE S-40-27	1.000 EACH		.		.
	SPV.0060 SPECIAL 0028.					
3545	REMOVING OLD SIGN STRUCTURE S-40-308	1.000 EACH		.		.

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	SPV.0060 SPECIAL 0029.					
3550	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-310	EACH		.		.
	SPV.0060 SPECIAL 0030.					
3555	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-311	EACH		.		.
	SPV.0060 SPECIAL 0031.					
3560	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-312	EACH		.		.
	SPV.0060 SPECIAL 0032.					
3565	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-33	EACH		.		.
	SPV.0060 SPECIAL 0033.					
3570	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-36	EACH		.		.
	SPV.0060 SPECIAL 0034.					
3575	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-37	EACH		.		.
	SPV.0060 SPECIAL 0035.					
3580	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-38	EACH		.		.
	SPV.0060 SPECIAL 0036.					
3585	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-391	EACH		.		.
	SPV.0060 SPECIAL 0037.					
3590	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-408	EACH		.		.
	SPV.0060 SPECIAL 0038.					
3595	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-954	EACH		.		.
	SPV.0060 SPECIAL 0039.					
3600	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-202	EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 0040.					
3605	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-279	EACH		.		.
	SPV.0060 SPECIAL 0041.					
3610	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-48	EACH		.		.
	SPV.0060 SPECIAL 0042.					
3615	REMOVING OLD SIGN	1.000				
	STRUCTURE S-40-379	EACH		.		.
	SPV.0060 SPECIAL 0100.					
3620	SALVAGING CRASH CUSHION	9.000				
		EACH		.		.
	SPV.0060 SPECIAL 0101.					
3625	TEMPORARY BUS STOP PAD	10.000				
		EACH		.		.
	SPV.0060 SPECIAL 0104.					
3630	PARKING LOT BOLLARD	8.000				
		EACH		.		.
	SPV.0060 SPECIAL 0125.					
3635	CONCRETE BARRIER TYPE	13.000				
	S56 SPECIAL LIGHT POLE	EACH				
	BASE			.		.
	SPV.0060 SPECIAL 0126.					
3640	CONCRETE BARRIER TYPE	11.000				
	S56A SPECIAL LIGHT POLE	EACH				
	BASE			.		.
	SPV.0060 SPECIAL 0127.					
3645	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G1	EACH		.		.
	SPV.0060 SPECIAL 0128.					
3650	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G2	EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 0129.					
3655	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G3	EACH		.		.
	SPV.0060 SPECIAL 0130.					
3660	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G4	EACH		.		.
	SPV.0060 SPECIAL 0131.					
3665	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G5	EACH		.		.
	SPV.0060 SPECIAL 0132.					
3670	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G6	EACH		.		.
	SPV.0060 SPECIAL 0133.					
3675	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G7	EACH		.		.
	SPV.0060 SPECIAL 0134.					
3680	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G8	EACH		.		.
	SPV.0060 SPECIAL 0135.					
3685	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G9	EACH		.		.
	SPV.0060 SPECIAL 0136.					
3690	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G10	EACH		.		.
	SPV.0060 SPECIAL 0137.					
3695	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G11	EACH		.		.
	SPV.0060 SPECIAL 0138.					
3700	CONCRETE BARRIER	1.000				
	TRANSITION TYPE G12	EACH		.		.
	SPV.0060 SPECIAL 0150.					
3705	CONCRETE BARRIER	5.000				
	TRANSITION TYPE M1	EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 0151.					
3710	CONCRETE BARRIER	1.000				
	TRANSITION TYPE M2	EACH		.		.
	SPV.0060 SPECIAL 0152.					
3715	CONCRETE BARRIER	2.000				
	TRANSITION TYPE M3	EACH		.		.
	SPV.0060 SPECIAL 0300.					
3720	PAVEMENT MARKING GROOVED	13.000				
	PREFORMED THERMOPLASTIC	EACH				
	ARROWS, TYPE 1 **P**			.		.
	SPV.0060 SPECIAL 0301.					
3725	PAVEMENT MARKING GROOVED	38.000				
	PREFORMED THERMOPLASTIC	EACH				
	ARROWS, TYPE 2 **P**			.		.
	SPV.0060 SPECIAL 0302.					
3730	PAVEMENT MARKING GROOVED	11.000				
	PREFORMED THERMOPLASTIC	EACH				
	ARROWS, TYPE 3 **P**			.		.
	SPV.0060 SPECIAL 0303.					
3735	PAVEMENT MARKING GROOVED	30.000				
	PREFORMED THERMOPLASTIC	EACH				
	WORDS **P**			.		.
	SPV.0060 SPECIAL 0304.					
3740	PAVEMENT MARKING GROOVED	8.000				
	CONTRAST PREFORMED	EACH				
	THERMOPLASTIC ARROWS,					
	TYPE 2			.		.
	SPV.0060 SPECIAL 0305.					
3745	PAVEMENT MARKING GROOVED	8.000				
	CONTRAST PREFORMED	EACH				
	THERMOPLASTIC WORDS			.		.
	SPV.0060 SPECIAL 0306.					
3750	PAVEMENT MARKING GROOVED	7.000				
	CONTRAST PREFORMED	EACH				
	THERMOPLASTIC ARROWS					
	TYPE 4			.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 0400.					
3755	TRAFFIC CONTROL CLOSE-OPEN FREEWAY ENTRANCE RAMP	850.000 EACH		.		.
	SPV.0060 SPECIAL 0401.					
3760	TRAFFIC CONTROL CLOSE-OPEN FREEWAY TO FREEWAY SYSTEM RAMP	590.000 EACH		.		.
	SPV.0060 SPECIAL 0402.					
3765	TRAFFIC CONTROL INTERIM FREEWAY LANE CLOSURE	2,265.000 EACH		.		.
	SPV.0060 SPECIAL 0403.					
3770	TRAFFIC CONTROL LOCAL ROAD LANE CLOSURES	30.000 EACH		.		.
	SPV.0060 SPECIAL 0404.					
3775	TRAFFIC CONTROL COVERING SIGNS TYPE I LEFT IN PLACE	27.000 EACH		.		.
	SPV.0060 SPECIAL 0405.					
3780	TEMPORARY SIGN PORTABLE SUPPORT	11.000 EACH		.		.
	SPV.0060 SPECIAL 0406.					
3785	MOBILIZATIONS EMERGENCY PAVEMENT REPAIR	8.000 EACH		.		.
	SPV.0060 SPECIAL 0407.					
3790	INSTALLING STATE FURNISHED SIGNS	263.000 EACH		.		.
	SPV.0060 SPECIAL 0408.					
3791	TRAFFIC CONTROL FULL FREEWAY CLOSURE	280.000 EACH		.		.
	SPV.0060 SPECIAL 0500.					
3795	TRAFFIC CONTROL DRUMS LEFT IN PLACE	664.000 EACH		.		.

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	SPV.0060 SPECIAL 0501.					
3800	TRAFFIC CONTROL BARRICADES TYPE II LEFT IN PLACE	7.000 EACH		.		.
	SPV.0060 SPECIAL 0502.					
3805	TRAFFIC CONTROL BARRICADES TYPE III LEFT IN PLACE	66.000 EACH		.		.
	SPV.0060 SPECIAL 0503.					
3810	TRAFFIC CONTROL WARNING LIGHTS TYPE A LEFT IN PLACE	132.000 EACH		.		.
	SPV.0060 SPECIAL 0504.					
3815	TRAFFIC CONTROL WARNING LIGHTS TYPE C LEFT IN PLACE	99.000 EACH		.		.
	SPV.0060 SPECIAL 0505.					
3820	TRAFFIC CONTROL SIGNS LEFT IN PLAC	103.000 EACH		.		.
	SPV.0060 SPECIAL 0506.					
3825	TRAFFIC CONTROL DETOUR SIGNS LEFT IN PLACE	815.000 EACH		.		.
	SPV.0060 SPECIAL 0507.					
3830	CRASH CUSHION TEMPORARY LEFT IN PLACE	36.000 EACH		.		.
	SPV.0060 SPECIAL 0800.					
3835	SURFACE SETTLEMENT PLATES	4.000 EACH		.		.
	SPV.0060 SPECIAL 0900.					
3840	LED PARKING LOT LIGHTING ASSEMBLY	3.000 EACH		.		.
	SPV.0060 SPECIAL 0902.					
3845	REMOVING EXISTING FLOODLIGHT ASSEMBLY	4.000 EACH		.		.

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3850	SPV.0060 SPECIAL 0903. RELOCATING EXISTING LIGHTING ASSEMBLY	3.000 EACH		.		.
3855	SPV.0060 SPECIAL 1010. LAMP DISPOSAL HIGH INTENSITY DISCHARGE	253.000 EACH		.		.
3860	SPV.0060 SPECIAL 1019. RELOCATING LIGHT POLES, ARMS AND LUMINAIRES	4.000 EACH		.		.
3865	SPV.0060 SPECIAL 1020. SALVAGING LIGHT POLES AND ARMS - WEST ALLIS	11.000 EACH		.		.
3870	SPV.0060 SPECIAL 1021. SALVAGING LIGHT POLES, ARMS AND LUMINAIRES - WEST ALLIS	14.000 EACH		.		.
3875	SPV.0060 SPECIAL 1031. REMOVING ALUMINUM LIGHT POLES, AND ARMS - WAUWATOSA	9.000 EACH		.		.
3880	SPV.0060 SPECIAL 1032. REMOVING CONCRETE LIGHT POLES, AND ARMS - WAUWATOSA	5.000 EACH		.		.
3885	SPV.0060 SPECIAL 1033. REMOVING ALUMINUM LIGHT POLES, ARMS AND LUMINAIRES	105.000 EACH		.		.
3890	SPV.0060 SPECIAL 1035. WOOD POLE LIGHTING 60-FT	70.000 EACH		.		.
3895	SPV.0060 SPECIAL 1036. POLES WOOD 60-FT	22.000 EACH		.		.

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	SPV.0060 SPECIAL 1037.					
3900	POLES WOOD 35-FT	2.000				
		EACH		.		.
	SPV.0060 SPECIAL 1038.					
3905	MOVING POLES WOOD 60-FT	6.000				
	AND FLOODLIGHTS	EACH		.		.
	SPV.0060 SPECIAL 1040.					
3910	REMOVING POLES WOOD	38.000				
	60-FT AND FLOODLIGHTS	EACH		.		.
	SPV.0060 SPECIAL 1041.					
3915	REMOVING POLES WOOD	10.000				
	60-FT	EACH		.		.
	SPV.0060 SPECIAL 1051.					
3920	PULL BOXES STEEL	3.000				
	24X42-INCH GROUNDED	EACH		.		.
	SPV.0060 SPECIAL 1056.					
3925	JUNCTION BOXES	17.000				
	18X12X6-INCH COATED	EACH		.		.
	SPV.0060 SPECIAL 1065.					
3930	LUMINAIRE UTILITY LED E	13.000				
		EACH		.		.
	SPV.0060 SPECIAL 1070.					
3935	LUMINAIRES FLOODLIGHT	73.000				
	1000W HPS	EACH		.		.
	SPV.0060 SPECIAL 1071.					
3940	LUMINAIRES FLOODLIGHT	11.000				
	400W HPS	EACH		.		.
	SPV.0060 SPECIAL 1078.					
3945	LUMINAIRE (UDL) WALLPACK	20.000				
	LED	EACH		.		.
	SPV.0060 SPECIAL 1090.					
3950	SALVAGE DISTRIBUTION	5.000				
	CENTERS	EACH		.		.

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3955	SPV.0060 SPECIAL 1096. LIGHTING CONTROL CABINET 240/480 VAC	4.000 EACH		.		.
3960	SPV.0060 SPECIAL 1100. LIGHTING CONTROL CABINET 480/277 VAC	3.000 EACH		.		.
3965	SPV.0060 SPECIAL 1101. CONCRETE CONTROL CABINET BASES, SPECIAL	8.000 EACH		.		.
3970	SPV.0060 SPECIAL 1130. POLES ALUMINUM TYPE F	14.000 EACH		.		.
3975	SPV.0060 SPECIAL 1131. CONCRETE BASES TYPE B	16.000 EACH		.		.
3980	SPV.0060 SPECIAL 1132. CONCRETE BASES TYPE 5L	2.000 EACH		.		.
3985	SPV.0060 SPECIAL 1152. ELECTRICAL SERVICE METER BREAKER PEDESTAL TEMPORARY LIGHTING	1.000 EACH		.		.
3990	SPV.0060 SPECIAL 1153. REMOVING ELECTRICAL SERVICE METER BREAKER PEDESTAL LIGHTING	6.000 EACH		.		.
3995	SPV.0060 SPECIAL 2001. GROUND ROD	24.000 EACH		.		.
4000	SPV.0060 SPECIAL 2002. REMOVING RAMP CONTROL SIGNAL ASSEMBLY SIDEMOUNT	8.000 EACH		.		.

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4005	SPV.0060 SPECIAL 2003. REMOVING CONTROLLER CABINET	8.000 EACH		.		.
4010	SPV.0060 SPECIAL 2004. REMOVING CONTROLLER CABINET BASE	8.000 EACH		.		.
4015	SPV.0060 SPECIAL 2005. REMOVING CONTROLLER RAMP METER PROCESSOR ASSEMBLY	4.000 EACH		.		.
4020	SPV.0060 SPECIAL 2006. REMOVING ELECTRICAL SERVICE METER BREAKER PEDESTAL	2.000 EACH		.		.
4025	SPV.0060 SPECIAL 2007. REMOVING COMMUNICATION VAULT	3.000 EACH		.		.
4030	SPV.0060 SPECIAL 2008. REMOVING OVERHEAD FREEWAY DMS	1.000 EACH		.		.
4035	SPV.0060 SPECIAL 2009. REMOVING MICROWAVE DETECTOR ASSEMBLY	5.000 EACH		.		.
4040	SPV.0060 SPECIAL 2010. INSTALL PORTABLE VIDEO SURVEILLANCE SYSTEM	2.000 EACH		.		.
4045	SPV.0060 SPECIAL 2011. RELOCATING PORTABLE VIDEO SURVEILLANCE SYSTEM	4.000 EACH		.		.
4050	SPV.0060 SPECIAL 2012. INSTALL TEMPORARY VEHICLE DETECTOR ASSEMBLY	10.000 EACH		.		.

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	SPV.0060 SPECIAL 2013.					
4055	REFOCUSING TEMPORARY VEHICLE DETECTOR ASSEMBLY	45.000 EACH		.		.
	SPV.0060 SPECIAL 2014.					
4060	REMOVING COMMUNICATION HUB BUILDING	1.000 EACH		.		.
	SPV.0060 SPECIAL 2015.					
4065	REMOVING COMMUNICATION HUB BUILDING FOUNDATION	1.000 EACH		.		.
	SPV.0060 SPECIAL 2016.					
4070	REMOVING ELECTRONIC BLANK OUT SIGN ASSEMBLY	2.000 EACH		.		.
	SPV.0060 SPECIAL 2017.					
4075	INSTALL 5.8 GHZ ETHERNET BRIDGE	1.000 EACH		.		.
	SPV.0060 SPECIAL 2018.					
4080	REMOVING ON-RAMP CLOSURE GATE	1.000 EACH		.		.
	SPV.0060 SPECIAL 2019.					
4085	INSTALL FIBER OPTIC MEDIA CONVERTER	12.000 EACH		.		.
	SPV.0060 SPECIAL 2020.					
4090	INSTALLING CONDUIT INTO EXISTING MANHOLE	4.000 EACH		.		.
	SPV.0060 SPECIAL 2021.					
4095	4-FT DIAMETER MANHOLE TYPE TES	3.000 EACH		.		.
	SPV.0060 SPECIAL 2022.					
4100	ADJUSTING TES MANHOLE	17.000 EACH		.		.

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4105	SPV.0060 SPECIAL 2023. 4' DIAMETER "DOGHOUSE" MANHOLE TYPE TES	1.000 EACH		.		.
4110	SPV.0060 SPECIAL 2030. INSTALL CABINET HEATER AND THERMOSTAT	2.000 EACH		.		.
4115	SPV.0060 SPECIAL 2031. INSTALL WAVETRONIX CLICK 200 MODULE	4.000 EACH		.		.
4120	SPV.0060 SPECIAL 2032. INSTALL WAVETRONIX POWER MODULE	4.000 EACH		.		.
4125	SPV.0060 SPECIAL 2033. INSTALL WAVETRONIX DETECTOR MODULE	4.000 EACH		.		.
4130	SPV.0060 SPECIAL 2034. INSTALL CELLULAR ANTENNA	4.000 EACH		.		.
4135	SPV.0060 SPECIAL 2040. WIRELESS TRAFFIC SENSOR	11.000 EACH		.		.
4140	SPV.0060 SPECIAL 2041. WIRELESS TRAFFIC SENSOR ACCESS POINT	1.000 EACH		.		.
4145	SPV.0060 SPECIAL 2042. WIRELESS TRAFFIC SENSOR REPEATER	2.000 EACH		.		.
4150	SPV.0060 SPECIAL 2043. WIRELESS TRAFFIC SENSOR CONTACT CLOSURE MODULE	1.000 EACH		.		.

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	SPV.0060 SPECIAL 2044.					
4155	WIRELESS TRAFFIC SENSOR	5.000				
	CONTACT CLOSURE	EACH				
	EXTENSION CARD			.		.
	SPV.0060 SPECIAL 2045.					
4160	ADJUSTING COMMUNICATION	1.000				
	VAULT	EACH		.		.
	SPV.0060 SPECIAL 2046.					
4165	LOOP DETECTOR WIRE	7.000				
	PROTECTION	EACH		.		.
	SPV.0060 SPECIAL 2047.					
4170	REMOVING TEMPORARY	7.000				
	VEHICLE DETECTOR	EACH				
	ASSEMBLY			.		.
	SPV.0060 SPECIAL 3001.					
4175	CONCRETE BASES TYPE 1	3.000				
	SPREAD FOOTING	EACH		.		.
	SPV.0060 SPECIAL 3002.					
4180	CONCRETE CONTROL CABINET	2.000				
	BASE TYPE 9 SPECIAL	EACH				
	(MOD)			.		.
	SPV.0060 SPECIAL 3005.					
4185	TRAFFIC SIGNAL VAULT	2.000				
		EACH		.		.
	SPV.0060 SPECIAL 3103.					
4190	TRAFFIC POLYMER CONCRETE	7.000				
	VAULT 13-IN X 24-IN X	EACH				
	18-IN			.		.
	SPV.0060 SPECIAL 3104.					
4195	TRAFFIC POLYMER CONCRETE	1.000				
	VAULT 17-IN X 30-IN X	EACH				
	18-IN			.		.

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	SPV.0060 SPECIAL 4100.					
4200	ANCHOR ASSEMBLIES SIGN	9.000				
	BRIDGE STRUCTURES	EACH		.		.
	SPV.0060 SPECIAL 4105.					
4205	ANCHOR ASSEMBLIES NOISE	322.000				
	BARRIER STRUCTURES	EACH		.		.
	SPV.0060 SPECIAL 4110.					
4210	PILE DYNAMIC ANALYZER	57.000				
	(PDA) TESTING	EACH		.		.
	SPV.0060 SPECIAL 4115.					
4215	PILE DYNAMIC ANALYZER	57.000				
	(PDA) RESTRIKES	EACH		.		.
	SPV.0060 SPECIAL 4120.					
4220	BEARINGS HIGH-LOAD	4.000				
	MULTI-ROTATIONAL FIXED	EACH		.		.
	SPV.0060 SPECIAL 4125.					
4225	BEARINGS HIGH-LOAD	37.000				
	MULTI-ROTATIONAL GUIDED	EACH		.		.
	SPV.0060 SPECIAL 4130.					
4230	FLOOR DRAIN SPECIAL	7.000				
		EACH		.		.
	SPV.0060 SPECIAL 4140.					
4235	ANCHOR SLAB INLET COVER	31.000				
	SPECIAL	EACH		.		.
	SPV.0060 SPECIAL 4150.					
4240	TIEBACK ANCHORS	566.000				
		EACH		.		.
	SPV.0060 SPECIAL 4155.					
4245	TIEBACK ANCHORS	29.000				
	PERFORMANCE TESTS	EACH		.		.
	SPV.0060 SPECIAL 4160.					
4250	DRILLED FOUNDATION SHAFT	4.000				
	BASE GROUTING	EACH		.		.

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	SPV.0060 SPECIAL 4170.					
4255	THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 78.74-IN	4.000 EACH		.		.
	SPV.0060 SPECIAL 4175.					
4260	THERMAL INTEGRITY PROFILER (TIP) TESTING WALL SECANT PILE 47. 24-IN	3.000 EACH		.		.
	SPV.0060 SPECIAL 4180.					
4265	PRECAST BEAMS	2.000 EACH		.		.
	SPV.0060 SPECIAL 4190.					
4270	CONCRETE POLYMER PULL BOX	8.000 EACH		.		.
	SPV.0060 SPECIAL 4195.					
4275	CONCRETE BASE SLEEVES	2.000 EACH		.		.
	SPV.0060 SPECIAL 5000.					
4280	REMOVING HYDRANT	27.000 EACH		.		.
	SPV.0060 SPECIAL 5001.					
4285	INSTALL HYDRANT	27.000 EACH		.		.
	SPV.0060 SPECIAL 5002.					
4290	CONNECT ORIGINAL SERVICE (C.O.S.)	52.000 EACH		.		.
	SPV.0060 SPECIAL 5003.					
4295	REPLACE ORIGINAL SERVICE (R.O.S)	9.000 EACH		.		.
	SPV.0060 SPECIAL 5004.					
4300	ADJUSTING WATER VALVE	54.000 EACH		.		.

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4305	SPV.0060 SPECIAL 5005. ROADWAY SERVICE BOX (R.S.B.)	1.000 EACH		.		.
4310	SPV.0060 SPECIAL 5007. 72-INCH PRECAST VALVE VAULT WITH 24-INCH D.D. GATE VALVE	2.000 EACH		.		.
4315	SPV.0060 SPECIAL 5008. PERMANENT CONNECTION TO EXISTING 24-INCH WATER MAIN	3.000 EACH		.		.
4320	SPV.0060 SPECIAL 5009. TEMPORARY CONNECTION TO EXISTING 24-INCH WATER MAIN	1.000 EACH		.		.
4325	SPV.0060 SPECIAL 5010. GROUND HYDRANT ASSEMBLY	2.000 EACH		.		.
4330	SPV.0060 SPECIAL 5011. ADJUSTING SANITARY MANHOLE	46.000 EACH		.		.
4335	SPV.0060 SPECIAL 5013. RECONSTRUCT SANITARY MANHOLE	3.000 EACH		.		.
4340	SPV.0060 SPECIAL 5100. SAN SEWER DROP MH PRECAST CONC 48-INCH W/ CASTING	5.000 EACH		.		.
4345	SPV.0060 SPECIAL 5101. SAN SEWER MH PRECAST CONC 48-INCH W/ CASTING	30.000 EACH		.		.
4350	SPV.0060 SPECIAL 5102. SANITARY MANHOLE VACUUM TESTING	35.000 EACH		.		.

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4355	SPV.0060 SPECIAL 5103. REMOVING SANITARY MANHOLE	20.000 EACH		.		.
4360	SPV.0060 SPECIAL 5104. ABANDONING SANITARY MANHOLE	3.000 EACH		.		.
4365	SPV.0060 SPECIAL 5107. PARTIAL ABANDONMENT OF MMSD SANITARY MANHOLE	1.000 EACH		.		.
4370	SPV.0060 SPECIAL 5108. ABANDONING MMSD ACCESS PANEL	1.000 EACH		.		.
4375	SPV.0060 SPECIAL 8004. INLET COVERS TYPE 57	12.000 EACH		.		.
4380	SPV.0060 SPECIAL 8005. COVER PLATE LEFT IN PLACE	42.000 EACH		.		.
4385	SPV.0060 SPECIAL 8007. RECONNECT STORM SEWER LATERALS	115.000 EACH		.		.
4390	SPV.0060 SPECIAL 8012. MANHOLES 9-FT SPECIAL	30.000 EACH		.		.
4395	SPV.0060 SPECIAL 8013. MANHOLES 10-FT SPECIAL	12.000 EACH		.		.
4400	SPV.0060 SPECIAL 8015. PIPE CONNECTION TO EXISTING STRUCTURE	43.000 EACH		.		.
4405	SPV.0060 SPECIAL 8017. SEDIMENTATION BASIN	16.000 EACH		.		.

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	SPV.0060 SPECIAL 8018.					
4410	REMOVING BULKHEAD	6.000				
		EACH		.		.
	SPV.0060 SPECIAL 8040.					
4415	EMERGENCY SHAFT	2.000				
		EACH		.		.
	SPV.0060 SPECIAL 8050.					
4420	INLET COVERS TYPE 27-M	127.000				
		EACH		.		.
	SPV.0060 SPECIAL 8052.					
4425	REMOVING WELDS FROM	9.000				
	STORM SEWER COVERS	EACH		.		.
	SPV.0060 SPECIAL 8062.					
4430	REMOVE AND CAP EXISTING	12.000				
	DRAINAGE STORM SEWER	EACH				
	STRUCTURE			.		.
	SPV.0060 SPECIAL 8080.					
4435	WELDING SEWER ACCESS	26.000				
	COVERS	EACH		.		.
	SPV.0060 SPECIAL 8500.					
4440	STORM SEWER STRUCTURE	1.000				
	Z813	EACH		.		.
	SPV.0060 SPECIAL 8501.					
4445	STORM SEWER STRUCTURE	1.000				
	Z2822	EACH		.		.
	SPV.0060 SPECIAL 8502.					
4450	STORM SEWER STRUCTURE	1.000				
	Z4048	EACH		.		.
	SPV.0060 SPECIAL 8503.					
4455	STORM SEWER STRUCTURE	1.000				
	Z4619	EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 8504.					
4460	STORM SEWER STRUCTURE	1.000				
	Z4621	EACH		.		.
	SPV.0060 SPECIAL 8505.					
4465	STORM SEWER STRUCTURE	1.000				
	Z5348	EACH		.		.
	SPV.0060 SPECIAL 8506.					
4470	STORM SEWER STRUCTURE	1.000				
	Z6374	EACH		.		.
	SPV.0060 SPECIAL 8507.					
4475	STORM SEWER STRUCTURE	1.000				
	Z6382	EACH		.		.
	SPV.0060 SPECIAL 8508.					
4480	STORM SEWER STRUCTURE	1.000				
	Z6661	EACH		.		.
	SPV.0060 SPECIAL 8509.					
4485	STORM SEWER STRUCTURE	1.000				
	Z6666D	EACH		.		.
	SPV.0060 SPECIAL 8510.					
4490	STORM SEWER STRUCTURE	1.000				
	Z6707	EACH		.		.
	SPV.0060 SPECIAL 8511.					
4495	STORM SEWER STRUCTURE	1.000				
	Z6725	EACH		.		.
	SPV.0060 SPECIAL 8512.					
4500	STORM SEWER STRUCTURE	1.000				
	Z6753A	EACH		.		.
	SPV.0060 SPECIAL 8513.					
4505	STORM SEWER STRUCTURE	1.000				
	Z6753C	EACH		.		.
	SPV.0060 SPECIAL 8514.					
4510	STORM SEWER STRUCTURE	1.000				
	Z6764	EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 8515.					
4515	STORM SEWER STRUCTURE	1.000				
	Z6828	EACH		.		.
	SPV.0060 SPECIAL 8516.					
4520	STORM SEWER STRUCTURE	1.000				
	Z6852	EACH		.		.
	SPV.0060 SPECIAL 8517.					
4525	STORM SEWER STRUCTURE	1.000				
	Z6647	EACH		.		.
	SPV.0060 SPECIAL 8518.					
4530	STORM SEWER STRUCTURE	1.000				
	Z6390	EACH		.		.
	SPV.0060 SPECIAL 8519.					
4535	STORM SEWER STRUCTURE	1.000				
	Z7945	EACH		.		.
	SPV.0075 SPECIAL 0010.					
4540	OBSTRUCTIONS TRENCHLESS	15.000				
	UTILITY CONSTRUCTION	HRS		.		.
	SPV.0075 SPECIAL 4200.					
4545	OBSTRUCTIONS DRILLED	62.000				
	FOUNDATION SHAFT	HRS		.		.
	SPV.0075 SPECIAL 4205.					
4550	OBSTRUCTIONS WALL SECANT	12.000				
	PILE	HRS		.		.
	SPV.0075 SPECIAL 4210.					
4555	OBSTRUCTIONS FOUNDATION	72.000				
	DRILLING	HRS		.		.
	SPV.0075 SPECIAL 4215.					
4560	OBSTRUCTIONS SIGN	44.000				
	SUPPORTS CONCRETE	HRS				
	MASONRY			.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0075 SPECIAL 8097.					
4565	OBSTRUCTIONS TUNNEL EXCAVATION	44.000 HRS	.		.	
	SPV.0085 SPECIAL 0200.					
4570	SEEDING MIXTURE NATIVE SEED BUTTERFLY MIX	145.000 LB	.		.	
	SPV.0085 SPECIAL 0900.					
4575	ICE HPC HOT WEATHER CONCRETING	1,269,600 LB	0.75000		952200.00	
	SPV.0085 SPECIAL 4300.					
4580	BAR STEEL REINFORCEMENT HS STAINLESS BRIDGES	700,224.000 LB	.		.	
	SPV.0085 SPECIAL 4310.					
4585	POST-TENSIONING INTEGRAL PIER CAP	8,795.000 LB	.		.	
	SPV.0090 SPECIAL 0010.					
4590	REMOVING PAVEMENT MARKINGS WATER BLASTING	10,000.000 LF	.		.	
	SPV.0090 SPECIAL 0011.					
4595	REMOVING CONCRETE BARRIER TEMPORARY PRECAST	12,100.000 LF	.		.	
	SPV.0090 SPECIAL 0012.					
4600	REMOVING TEMPORARY SHORING LEFT IN PLACE	122.000 LF	.		.	
	SPV.0090 SPECIAL 0014.					
4605	REMOVING STEEL PIPE	775.000 LF	.		.	
	SPV.0090 SPECIAL 0015.					
4610	REMOVING WATER PIPE	700.000 LF	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0090 SPECIAL 0016.					
4615	REMOVING CONCRETE ENCASED DUCT BANK	6,043.000 LF		.		.
	SPV.0090 SPECIAL 0100.					
4620	CONCRETE BARRIER TYPE S42C WITH 48-INCH PAN **P**	1,033.000 LF		.		.
	SPV.0090 SPECIAL 0101.					
4625	CONCRETE BARRIER TYPE S56 SPECIAL **P**	1,867.000 LF		.		.
	SPV.0090 SPECIAL 0102.					
4630	CONCRETE BARRIER TYPE S56A SPECIAL **P**	2,378.000 LF		.		.
	SPV.0090 SPECIAL 0103.					
4635	CONCRETE BARRIER TYPE S42 WITH 24-INCH PAN **P**	6,786.000 LF		.		.
	SPV.0090 SPECIAL 0104.					
4640	CONCRETE BARRIER VERTICAL BACK TYPE S42-INCH MOD WITH 24-INCH PAN **P**	3,340.000 LF		.		.
	SPV.0090 SPECIAL 0105.					
4645	CONCRETE BARRIER TYPE S56 WITH 24-INCH PAN **P**	250.000 LF		.		.
	SPV.0090 SPECIAL 0125.					
4650	MAINTAIN CONCRETE BARRIER TEMPORARY PRECAST	23,555.000 LF		.		.
	SPV.0090 SPECIAL 0126.					
4655	PIPE UNDERDRAIN 6-INCH SPECIAL	65,601.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0090 SPECIAL 0150.					
4660	CONCRETE GUTTER SPECIAL	1,507.000				
	P	LF		.		.
	SPV.0090 SPECIAL 0151.					
4665	CONCRETE CURB & GUTTER	81.000				
	37-INCH **P**	LF		.		.
	SPV.0090 SPECIAL 0152.					
4670	CONCRETE CURB & GUTTER	1,076.000				
	4-INCH SLOPED 60-INCH	LF				
	TYPE A **P**			.		.
	SPV.0090 SPECIAL 0300.					
4675	PAVEMENT MARKING GROOVED	68.000				
	PREFORMED THERMOPLASTIC	LF				
	STOP LINE, 18-INCH **P**			.		.
	SPV.0090 SPECIAL 0301.					
4680	PAVEMENT MARKING GROOVED	1,013.000				
	PREFORMED THERMOPLASTIC	LF				
	STOP LINE, 24-INCH **P**			.		.
	SPV.0090 SPECIAL 0302.					
4685	PAVEMENT MARKING GROOVED	823.000				
	PREFORMED THERMOPLASTIC	LF				
	CROSSWALK, 6-INCH **P**			.		.
	SPV.0090 SPECIAL 0303.					
4690	PAVEMENT MARKING GROOVED	3,116.000				
	PREFORMED THERMOPLASTIC	LF				
	CROSSWALK, 12-INCH **P**			.		.
	SPV.0090 SPECIAL 0305.					
4695	PAVEMENT MARKING GROOVD	36.000				
	PREFORMD THERMOPLASTIC	LF				
	ZEBRA MARKING, 24 IN					
	P			.		.
	SPV.0090 SPECIAL 0310.					
4700	PAVEMENT MARKING	5,028.000				
	CONTRAST EPOXY 7-INCH	LF				
	P			.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0090 SPECIAL 0311.					
4705	PAVEMENT MARKING	718.000				
	CONTRAST EPOXY 11-INCH	LF				
	P			.		.
	SPV.0090 SPECIAL 0400.					
4710	GLARE SCREENS TEMPORARY	3,263.000				
		LF		.		.
	SPV.0090 SPECIAL 0401.					
4715	TRAFFIC CHANNELIZING	760.000				
	CURB SYSTEM	LF		.		.
	SPV.0090 SPECIAL 0501.					
4720	GLARE SCREENS TEMPORARY	2,698.000				
	LEFT IN PLACE	LF		.		.
	SPV.0090 SPECIAL 0502.					
4725	CONCRETE BARRIER	39,835.000				
	TEMPORARY PRECAST	LF				
	DELIVERED SPECIAL **P**			.		.
	SPV.0090 SPECIAL 0600.					
4730	FENCE TEMPORARY 6-FT	1,060.000				
		LF		.		.
	SPV.0090 SPECIAL 0602.					
4735	FENCE TEMPORARY LEFT IN	1,834.000				
	PLACE 6-FT	LF		.		.
	SPV.0090 SPECIAL 0603.					
4740	FENCE TEMPORARY LEFT IN	1,603.000				
	PLACE 8-FT	LF		.		.
	SPV.0090 SPECIAL 0604.					
4745	FENCE CHAIN LINK	5,435.000				
	SCREENING 6-FT	LF		.		.
	SPV.0090 SPECIAL 0900.					
4750	MINOR RETAINING WALL R-1	331.000				
		LF		.		.

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	SPV.0090 SPECIAL 0901.					
4755	MINOR RETAINING WALL R-2	154.000				
		LF		.		.
	SPV.0090 SPECIAL 1005.					
4760	CABLE AERIAL ALUMINUM 6 AWG QUADRUPLEX	10,417.000				
		LF		.		.
	SPV.0090 SPECIAL 1006.					
4765	CABLE AERIAL ALUMINUM 4 AWG QUADRUPLEX	9,538.000				
		LF		.		.
	SPV.0090 SPECIAL 1007.					
4770	CABLE AERIAL ALUMINUM 2 AWG QUADRUPLEX	1,258.000				
		LF		.		.
	SPV.0090 SPECIAL 1009.					
4775	CABLE AERIAL ALUMINUM 6 AWG TRIPLEX	496.000				
		LF		.		.
	SPV.0090 SPECIAL 1010.					
4780	CABLE AERIAL ALUMINUM 4 AWG TRIPLEX	1,800.000				
		LF		.		.
	SPV.0090 SPECIAL 1011.					
4785	CABLE AERIAL ALUMINUM 2 AWG TRIPLEX	72.000				
		LF		.		.
	SPV.0090 SPECIAL 1026.					
4790	CABLE IN DUCT 5-6 AWG	1,408.000				
		LF		.		.
	SPV.0090 SPECIAL 2021.					
4795	4-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	848.000				
		LF		.		.
	SPV.0090 SPECIAL 2022.					
4800	3-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	289.000				
		LF		.		.

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4805	SPV.0090 SPECIAL 2023. 2-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	268.000 LF		.		.
4810	SPV.0090 SPECIAL 2024. CONDUIT SUBDUCT 1-INCH	575.000 LF		.		.
4815	SPV.0090 SPECIAL 3001. CABLE TYPE UF 2-14 AWG	6,020.000 LF		.		.
4820	SPV.0090 SPECIAL 3002. WOVEN PULL TAPE	1,126.000 LF		.		.
4825	SPV.0090 SPECIAL 3003. INSTALL CAMERA POWER CABLE	7,046.000 LF		.		.
4830	SPV.0090 SPECIAL 3004. INSTALL CAT-5E CABLE	7,630.000 LF		.		.
4835	SPV.0090 SPECIAL 4400. FENCE DECORATIVE BRIDGE	1,043.000 LF		.		.
4840	SPV.0090 SPECIAL 4410. FENCE DECORATIVE WING	217.000 LF		.		.
4845	SPV.0090 SPECIAL 4420. FENCE DECORATIVE WALL	1,245.000 LF		.		.
4850	SPV.0090 SPECIAL 4430. PILING SLEEVES	2,709.000 LF		.		.

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	SPV.0090 SPECIAL 4440.					
4855	FOUNDATION DRILLING	29,158.000				
	P	LF		.		.
	SPV.0090 SPECIAL 4445.					
4860	PRE-BORING SPECIAL	312.000				
		LF		.		.
	SPV.0090 SPECIAL 4450.					
4865	WALL SECANT PILE 47.	446.000				
	24-INCH **P**	LF		.		.
	SPV.0090 SPECIAL 4455.					
4870	DRILLED FOUNDATION SHAFT	289.200				
	78.74-INCH **P**	LF		.		.
	SPV.0090 SPECIAL 4470.					
4875	SHEET PILING INTERLOCK	2,490.000				
	WATERPROOFING	LF		.		.
	SPV.0090 SPECIAL 4480.					
4880	PRESTRESSED GIRDER TYPE	266.000				
	I 54W-INCH SPECIAL	LF		.		.
	SPV.0090 SPECIAL 5000.					
4885	STEEL CASING WITH	116.000				
	DUCTILE IRON 12-INCH	LF				
	CARRIER			.		.
	SPV.0090 SPECIAL 5001.					
4890	STEEL CASING WITH	317.000				
	DUCTILE IRON 16-INCH	LF				
	CARRIER			.		.
	SPV.0090 SPECIAL 5002.					
4895	STEEL CASING WITH	421.000				
	DUCTILE IRON 24-INCH	LF				
	CARRIER			.		.
	SPV.0090 SPECIAL 5003.					
4900	DUCTILE IRON HYDRANT	339.000				
	BRANCH 6-INCH	LF		.		.

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	SPV.0090 SPECIAL 5004.					
4905	DUCTILE IRON WATER MAIN	989.000				
	6-INCH	LF		.		.
	SPV.0090 SPECIAL 5005.					
4910	DUCTILE IRON WATER MAIN	979.000				
	8-INCH	LF		.		.
	SPV.0090 SPECIAL 5006.					
4915	DUCTILE IRON WATER MAIN	71.000				
	12-INCH RESTRAINED JOINT	LF		.		.
	SPV.0090 SPECIAL 5007.					
4920	DUCTILE IRON WATER MAIN	5,100.000				
	16-INCH	LF		.		.
	SPV.0090 SPECIAL 5008.					
4925	DUCTILE IRON WATER MAIN	100.000				
	RESTRAINED JOINT 16-INCH	LF				
	RESTRAINED JOINT			.		.
	SPV.0090 SPECIAL 5009.					
4930	DUCTILE IRON WATER MAIN	42.000				
	24-INCH RESTRAINED JOINT	LF		.		.
	SPV.0090 SPECIAL 5010.					
4935	DUCTILE IRON (DI) AWWA	134.000				
	C-151 CL. 55 WATER MAIN	LF				
	24-INCH			.		.
	SPV.0090 SPECIAL 5011.					
4940	DUCTILE IRON (DI) AWWA	54.000				
	C-151 CL. 55 WATER MAIN	LF				
	16-INCH			.		.
	SPV.0090 SPECIAL 5012.					
4945	DUCTILE IRON (DI) AWWA	340.000				
	C-151 CL.55 WM 24-IN	LF				
	WITH 42-IN STEEL CASING			.		.
	SPV.0090 SPECIAL 5100.					
4950	ABANDONING SANITARY	1,124.000				
	SEWER 8-INCH	LF		.		.

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	SPV.0090 SPECIAL 5102.					
4955	ABANDONING SANITARY SEWER 12-INCH	1,005.000 LF		.		.
	SPV.0090 SPECIAL 5103.					
4960	SANITARY AIR TESTING	3,085.000 LF		.		.
	SPV.0090 SPECIAL 5104.					
4965	SANITARY SEWER LINING 8-INCH CURED-IN-PLACE	349.000 LF		.		.
	SPV.0090 SPECIAL 5105.					
4970	STEEL CASING WITH 8-INCH SANITARY SEWER CARRIER	655.000 LF		.		.
	SPV.0090 SPECIAL 5106.					
4975	STEEL CASING W/ 12-INCH SANITARY SEWER CARRIER	376.000 LF		.		.
	SPV.0090 SPECIAL 5107.					
4980	STEEL CASING WITH 6-INCH SANITARY SEWER CARRIER	18.000 LF		.		.
	SPV.0090 SPECIAL 5108.					
4985	SANITARY SEWER LATERAL CLASS "C" BEDDING	164.000 LF		.		.
	SPV.0090 SPECIAL 5109.					
4990	SANITARY SEWER 8-INCH SDR 35 CLASS "C" BEDDING	1,862.000 LF		.		.
	SPV.0090 SPECIAL 5110.					
4995	SANITARY SEWER 10-INCH SDR 35 CLASS "C" BEDDING	20.000 LF		.		.
	SPV.0090 SPECIAL 5111.					
5000	SANITARY SEWER 12-INCH SDR 35 CLASS "C" BEDDING	917.000 LF		.		.
	SPV.0090 SPECIAL 5112.					
5005	SANITARY SEWER 8-INCH SDR 26 CLASS "C" BEDDING	555.000 LF		.		.

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	SPV.0090 SPECIAL 5113.					
5010	SANITARY SEWER 12-INCH	33.000				
	SDR 26 CLASS "C" BEDDING	LF		.		.
	SPV.0090 SPECIAL 5114.					
5015	SANITARY SEWER 12-INCH	16.000				
	RCP CLASS V WITH	LF				
	CONCRETE ENCASEMENT			.		.
	SPV.0090 SPECIAL 5115.					
5020	REMOVING SANITARY SEWER	2,077.000				
	PIPE	LF		.		.
	SPV.0090 SPECIAL 8002.					
5025	STORM SEWER PIPE	978.000				
	REINFORCED CONC HORIZ	LF				
	ELLIP CLS HE-III					
	77X121-IN			.		.
	SPV.0090 SPECIAL 8003.					
5030	STORM SEWER PIPE	489.000				
	REINFORCED CONC HORIZ	LF				
	ELLIP CLS HE-IV					
	77X121-IN			.		.
	SPV.0090 SPECIAL 8004.					
5035	STORM SEWER PIPE	363.000				
	REINFORCED CONC HORIZ	LF				
	ELLIP CLASS HE-IV					
	38X60-IN			.		.
	SPV.0090 SPECIAL 8025.					
5040	PIPE UNDERDRAIN	400.000				
	EXPLORATION	LF		.		.
	SPV.0090 SPECIAL 8026.					
5045	STORM SEWER LATERAL	400.000				
	EXPLORATION	LF		.		.
	SPV.0090 SPECIAL 8030.					
5050	DRAIN SLOTTED VANE	2,577.000				
	LONGITUDINAL	LF		.		.

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5055	SPV.0090 SPECIAL 8096. TUNNEL EXCAVATION **P**	1,474.000 LF		.		.
5060	SPV.0105 SPECIAL 0001. SURVEY PROJECT 1060-33-80	LUMP	LUMP			.
5065	SPV.0105 SPECIAL 0002. PAVEMENT CLEANUP PROJECT 1060-33-80	LUMP	LUMP			.
5070	SPV.0105 SPECIAL 0003. CONCRETE PAVEMENT JOINT LAYOUT	LUMP	LUMP			.
5075	SPV.0105 SPECIAL 0010. REMOVING GEODETIC SURVEY MONUMENT 2X03	LUMP	LUMP			.
5080	SPV.0105 SPECIAL 0011. REMOVING GEODETIC SURVEY MONUMENT MILWAUKEE GPS AZ MARK	LUMP	LUMP			.
5085	SPV.0105 SPECIAL 0015. REMOVING PLAYGROUND	LUMP	LUMP			.
5090	SPV.0105 SPECIAL 0016. REMOVING WEATHER STATION CHESTER STREET	LUMP	LUMP			.
5095	SPV.0105 SPECIAL 0017. REMOVING WEATHER STATION ZOOFARI CENTER	LUMP	LUMP			.
5100	SPV.0105 SPECIAL 0100. MOVING SIGN BRIDGE CANTILEVERED S-40-379	LUMP	LUMP			.

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5105	SPV.0105 SPECIAL 0101. MOVING SIGN BRIDGE CANTILEVERED S-40-133	LUMP	LUMP			.
5110	SPV.0105 SPECIAL 0102. MOVING SIGN BRIDGE CANTILEVERED S-40-310	LUMP	LUMP			.
5115	SPV.0105 SPECIAL 0905. RAILING TUBULAR STEEL GALVANIZED PEDESTRIAN SOUTH WALL	LUMP	LUMP			.
5120	SPV.0105 SPECIAL 1006. MAINTENANCE OF LIGHTING SYSTEMS	LUMP	LUMP			.
5125	SPV.0105 SPECIAL 1007. LIGHTING SYSTEM INTEGRATOR	LUMP	LUMP			.
5130	SPV.0105 SPECIAL 2023. SAWING CONCRETE-ENCASED DUCT PACKAGE	LUMP	LUMP			.
5135	SPV.0105 SPECIAL 3001. REMOVE TRAFFIC SIGNALS USH 18 & 97TH STREET	LUMP	LUMP			.
5140	SPV.0105 SPECIAL 3002. REMOVE TRAFFIC SIGNALS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5145	SPV.0105 SPECIAL 3003. TRANSPORTING SIGNAL AND LIGHTING MATERIALS IH 94 RAMPS & STH 181	LUMP	LUMP			.
5150	SPV.0105 SPECIAL 3004. TRANSPORTING SIGNAL AND LIGHTING MATERIALS USH 45 RAMPS & USH 18	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0105 SPECIAL 3005.					
5155	TRANSPORTING SIGNAL AND LIGHTING MATERIALS USH 18 & N. 95TH STREET	LUMP	LUMP			.
	SPV.0105 SPECIAL 3006.					
5160	INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB1	LUMP	LUMP			.
	SPV.0105 SPECIAL 3007.					
5165	INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 45 RAMPS & USH 18 CB1	LUMP	LUMP			.
	SPV.0105 SPECIAL 3008.					
5170	TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS IH 94 RAMPS & STH 181	LUMP	LUMP			.
	SPV.0105 SPECIAL 3009.					
5175	TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS USH 45 RAMPS & USH 18	LUMP	LUMP			.
	SPV.0105 SPECIAL 3010.					
5180	TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS USH 18 & N. 95TH STREET	LUMP	LUMP			.
	SPV.0105 SPECIAL 3011.					
5185	INSTALL STATE FURNISHED EVP DETECTOR HEADS IH 94 RAMPS & STH 181	LUMP	LUMP			.
	SPV.0105 SPECIAL 3012.					
5190	INSTALL STATE FURNISHED EVP DETECTOR HEADS USH 45 RAMPS & USH 18	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5195	SPV.0105 SPECIAL 3013. INSTALL STATE FURNISHED EVP DETECTOR HEADS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5200	SPV.0105 SPECIAL 3014. EXISTING TEMPORARY EVP SYSTEM IH 94 EB RAMPS & STH 181	LUMP	LUMP			.
5205	SPV.0105 SPECIAL 3015. EXISTING TEMPORARY EVP SYSTEM IH 94 WB RAMPS & STH 181	LUMP	LUMP			.
5210	SPV.0105 SPECIAL 3016. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 18 & N. 95TH STREET	LUMP	LUMP			.
5215	SPV.0105 SPECIAL 3017. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB2	LUMP	LUMP			.
5220	SPV.0105 SPECIAL 3018. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 45 RAMPS & USH 18 CB2	LUMP	LUMP			.
5225	SPV.0105 SPECIAL 3019. TRANS AND INSTL STATE FURN RADAR DETECTION SYSTEM USH 45 RAMPS & USH 18	LUMP	LUMP			.
5235	SPV.0105 SPECIAL 3051. INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET IH 94 RAMPS & STH 181	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0105 SPECIAL 3052.					
5240	INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET USH 45 RAMPS & USH 18	LUMP	LUMP			.
	SPV.0105 SPECIAL 3053.					
5245	INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET USH 18 & N. 95TH STREET	LUMP	LUMP			.
	SPV.0105 SPECIAL 4500.					
5250	PAINTING POLYSILOXANE SYSTEM STRUCTURE B-40-855	LUMP	LUMP			.
	SPV.0105 SPECIAL 4520.					
5255	TRIAL SECANT WALL PANEL 47.24-INCH	LUMP	LUMP			.
	SPV.0105 SPECIAL 4540.					
5260	UNDERDECK UTILITY STRUCTURE B-40-866	LUMP	LUMP			.
	SPV.0105 SPECIAL 4550.					
5265	EXPANSION DEVICE MODULAR LRFD B-40-852	LUMP	LUMP			.
	SPV.0105 SPECIAL 4555.					
5270	EXPANSION DEVICE MODULAR LRFD B-40-855	LUMP	LUMP			.
	SPV.0105 SPECIAL 5000.					
5275	ADLER WATER BOOSTER STATION	LUMP	LUMP			.
	SPV.0105 SPECIAL 5001.					
5280	REMOVING OLD BOOSTER STATION	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5285	SPV.0105 SPECIAL 5002. BURLEIGH WATER BOOSTER STATION	LUMP	LUMP			.
5290	SPV.0105 SPECIAL 8098. CONTROL OF WATER	LUMP	LUMP			.
5295	SPV.0105 SPECIAL 8099. GEOTECHNICAL INSTRUMENTATION	LUMP	LUMP			.
5300	SPV.0110 SPECIAL 4600. TIMBER LAGGING **P**	282.400 MBM		.		.
5305	SPV.0135 SPECIAL 0001. VIBRATION MONITORING	300.000 MON		.		.
5310	SPV.0165 SPECIAL 0500. TRAFFIC CONTROL FIXED MESSAGE SIGNS LEFT IN PLACE	3,314.250 SF		.		.
5315	SPV.0165 SPECIAL 0900. WALL MODULAR BLOCK MECHANICALLY STABILIZED EARTH LRFD	1,825.000 SF		.		.
5320	SPV.0165 SPECIAL 4700. LONGITUDINAL GROOVING BRIDGE DECK **P**	222,208.000 SF		.		.
5325	SPV.0165 SPECIAL 4710. WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP PILOT **P**	180,144.000 SF		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0165 SPECIAL 4720.					
5330	WALL CONCRETE PANEL	13,925.000				
	MECHANICALLY STABILIZED	SF				
	EARTH LRFD LFCF **P**			.		.
	SPV.0165 SPECIAL 4740.					
5335	TEMP WALL WIRE FACED	32,827.000				
	MECHANICALLY STABILIZED	SF				
	EARTH LRFD/QMP PILOT			.		.
	SPV.0165 SPECIAL 4750.					
5340	GEOCOMPOSITE DRAINBOARD	94,084.000				
		SF		.		.
	SPV.0165 SPECIAL 4770.					
5345	PRESTRESSED PRECAST	2,765.000				
	CONCRETE WALL PANEL	SF		.		.
	SPV.0165 SPECIAL 8095.					
5350	SHAFT EXCAVATION SUPPORT	28,865.000				
	SYSTEM	SF		.		.
	SPV.0180 SPECIAL 0101.					
5355	JOINT SEALING	40,938.000				
		SY		.		.
	SPV.0180 SPECIAL 0102.					
5360	CONCRETE PAVEMENT REPAIR	3,000.000				
	SPECIAL	SY		.		.
	SPV.0180 SPECIAL 0103.					
5365	HIGH FRICTION SURFACE	7,446.000				
	TREATMENT CONCRETE	SY		.		.
	SPV.0180 SPECIAL 0104.					
5370	HIGH FRICTION SURFACE	14,592.000				
	TREATMENT ASPHALT	SY		.		.
	SPV.0180 SPECIAL 0105.					
5375	CONCRETE PAVEMENT	227,685.000				
	12-INCH SPECIAL	SY		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0180 SPECIAL 0106.					
5380	ASPHALTIC MATERIAL BINDER	3,407.000 SY		.		.
	SPV.0180 SPECIAL 0107.					
5385	EPOXY RESIN BINDER	250.000 SY		.		.
	SPV.0180 SPECIAL 0200.					
5390	TOPSOIL SPECIAL	383,676.000 SY		.		.
	SPV.0180 SPECIAL 0800.					
5395	GEOGRID REINFORCEMENT	51,388.000 SY		.		.
	SPV.0180 SPECIAL 0801.					
5400	SOIL DRYING	953,800.000 SY		.		.
	SPV.0180 SPECIAL 4800.					
5405	SLOPE PAVING CRUSHED AGGREGATE SPECIAL **P**	1,037.000 SY		.		.
	SPV.0195 SPECIAL 0100.					
5410	COLD PATCH	50.000 TON		.		.
	SPV.0195 SPECIAL 0101.					
5415	ASPHALTIC PAVEMENT REPAIR SPECIAL	2,395.000 TON		.		.
	SPV.0195 SPECIAL 0700.					
5420	MANAGEMENT OF PETROLEUM CONTAMINATED SOIL AND SOLID WASTE	13,942.000 TON		.		.
	SPV.0195 SPECIAL 0801.					
5425	SOIL DRYING AGENT	19,100.000 TON		.		.
	SECTION 0001 TOTAL					.

SECTION 0002 B-40-855 OPTION A
ALT GROUP AA1

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5430	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.
5435	209.0100 BACKFILL GRANULAR	40.000 CY	.			.
5440	502.0100 CONCRETE MASONRY BRIDGES **P**	951.000 CY	.			.
5445	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	214,290.000 LB	.			.
5450	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	200,370.000 LB	.			.
5455	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF	.			.
5460	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0001. B-40-855	1,295.000 SF	.			.
5465	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	5,706.000 DOL	1.00000		5706.00	
5470	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	7.000 EACH	.			.
5475	SPV.0060 SPECIAL 4171. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 98.43-IN	7.000 EACH	.			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5480	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	28.000 HRS		.		.
5485	SPV.0090 SPECIAL 4460. DRILLED FOUNDATION SHAFT 98.43-INCH **P**	495.000 LF		.		.
5490	SPV.0105 SPECIAL 4510. TRIAL DRILLED FOUNDATION SHAFT 98.43-INCH	LUMP	LUMP			.
	SECTION 0002 TOTAL					.

SECTION 0003 B-40-855 OPTION B
ALT GROUP AA2

5495	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.
5500	209.0100 BACKFILL GRANULAR	341.000 CY		.		.
5505	502.0100 CONCRETE MASONRY BRIDGES **P**	1,100.000 CY		.		.
5510	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	188,970.000 LB		.		.
5515	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	203,090.000 LB		.		.
5520	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	511.2200 TEMPORARY					
5525	SHORING LEFT IN PLACE	1,295.000				
	(STRUCTURE) 0001.	SF				
	B-40-855			.		.
	550.2168 PILING CIP					
5530	CONCRETE 16 X 0.50-INCH	2,100.000				
		LF		.		.
	715.0502 INCENTIVE					
5535	STRENGTH CONCRETE	6,600.000	1.00000		6600.00	
	STRUCTURES	DOL				
	SPV.0060 SPECIAL 4110.					
5540	PILE DYNAMIC ANALYZER	2.000				
	(PDA) TESTING	EACH		.		.
	SPV.0060 SPECIAL 4115.					
5545	PILE DYNAMIC ANALYZER	2.000				
	(PDA) RESTRIKES	EACH		.		.
	SPV.0060 SPECIAL 4160.					
5550	DRILLED FOUNDATION SHAFT	6.000				
	BASE GROUTING	EACH		.		.
	SPV.0060 SPECIAL 4171.					
5555	THERM INTEGRITY PROFILER	6.000				
	(TIP) TESTING DRILLED	EACH				
	FOUND SHAFT 98.43-IN			.		.
	SPV.0075 SPECIAL 4200.					
5560	OBSTRUCTIONS DRILLED	24.000				
	FOUNDATION SHAFT	HRS		.		.
	SPV.0090 SPECIAL 4460.					
5565	DRILLED FOUNDATION SHAFT	400.000				
	98.43-INCH **P**	LF		.		.
	SPV.0105 SPECIAL 4510.					
5570	TRIAL DRILLED FOUNDATION	LUMP	LUMP			
	SHAFT 98.43-INCH					.
	SECTION 0003 TOTAL					.
	TOTAL BID					.

Wisconsin Department of Transportation

Division of Transportation Systems Development
Bureau of Project Development
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August 12, 2014

NOTICE TO ALL CONTRACTORS:

Proposal #01: **1060-33-80, WISC 2014 314**
Zoo IC – Zoo Interchange Phase 1
Lincoln – Bluemound, 121st to 70th
USH 45
Milwaukee

Letting of August 26, 2014

This is Addendum No. 2, which provides for the following:

Special Provisions

Revised Special Provisions	
Article No.	Description
4	Prosecution and Progress.
8	Utilities.
54	Removing Old Culverts and Bridges.
86	Storm Sewer.
337	Ductile Iron Water Main 6-Inch, Item SPV.0090.5004, Ductile Iron Water Main 8-Inch, Item SPV.0090.5005, Ductile Iron Water Main 12-Inch Restrained Joint, Item SPV.0090.5006, Ductile Iron Water Main 16-Inch, Item SPV.0090.5007, Ductile Iron Water Main 16-Inch Restrained Joint, Item SPV.0090.5008, Ductile Iron Water Main 24-Inch Restrained Joint, Item SPV.0090.5009.
340	Abandoning Sanitary Sewer 8-Inch, Item SPV.0090.5100; Abandoning Sanitary Sewer 12-Inch, Item SPV0090.5102.
349	Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-III 77x121-Inch, Item SPV.0090.8002; Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 77x121-Inch, Item SPV.0090.8003; Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 38x60-Inch, Item SPV.0090.8004.
382	Burleigh Water Booster Station, Item SPV.0105.5002.
390	Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP Pilot, Item SPV.0165.4710.

Added Special Provisions	
Article No.	Description
412	Notice to Contractor – WDNR Forestry Staging Area.
413	Abandoning MMSD Sanitary Manhole, Item SPV.0060.5106.
414	MMSD Sanitary Sewer Manhole 48-Inch Precast Concrete w/Casting, Item SPV.0060.5109.

415	MMSD Sanitary Manhole Vacuum Test, Item SPV.0060.5110.
416	Ductile Iron Water Main 16-Inch Restrained Joint w/ Backfill Slurry, Item SPV.0090.5013.
417	Steel Casing w/Ductile Iron 16-Inch Carrier w/ Backfill Slurry, Item SPV.0090.5014.
418	Bentonite Trench Dam, Item SPV.0060.5014.
419	Sign Supports Special Mounting, Item SPV.0060.0153.

Deleted Special Provisions	
Article No.	Description
156	Removing Grout Pipe, Item SPV.0060.0012.

Schedule of Items

Revised Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
201.0120	Clearing	ID	1,211	1,219	1,219
201.0220	Grubbing	ID	1,211	1,219	1,219
204.0100	Removing Pavement **P**	SY	289,685	289,718	289,718
204.0155	Removing Concrete Sidewalk **P**	SY	9,719	9,825	9,825
204.0157	Removing Concrete Barrier **P**	LF	41,483	41,661	41,661
205.0100	Excavation Common **P**	CY	948,814	938,979	938,979
305.0120	Base Aggregate Dense 1 ¼ - Inch **P**	TON	284,083	284,379	284,379
312.0115	Select Crushed Material **P**	CY	205,909	206,091	206,091
455.0605	Tack Coat	GAL	3,706	3,716	3,716
465.0125	Asphaltic Surface Temporary	TON	13,430	13,602	13,602
616.0206	Fence Chain Link 6-FT	LF	7,612	10,116	10,116
616.0329.0002	Gates Chain Link 12-FT	EACH	2	3	3
628.2004	Erosion Mat Class I Type B	SY	332,795	313,004	313,004
628.2023	Erosion Mat Class II Type B	SY	134,805	135,048	135,048
628.7005	Inlet Protection Type A	EACH	1,442	1,438	1,438
628.7010	Inlet Protection Type B	EACH	414	418	418
628.7015	Inlet Protection Type C	EACH	672	666	666
628.7020	Inlet Protection Type D	EACH	1,682	1,678	1,678
628.7504	Temporary Ditch Checks	LF	3,640	3,422	3,422
629.0210	Fertilizer Type B	CWT	216.7	217.0	217.0
630.0130	Seeding Mixture No. 30	LB	3,997	4,003	4,003
630.0180	Seeding Mixture No. 80	LB	768	769	769
630.0200	Seeding Temporary	LB	4,439	4,445	4,445
630.0400	Seeding Nurse Crop	LB	1,012	898	898
634.0622	Posts Wood 4x6-Inch X 22-FT	EACH	60	62	62
643.0300	Traffic Control Drums	EACH	482,182	480,499	480,499
690.0150	Sawing Asphalt	LF	5,290	5,307	5,307
690.0250	Sawing Concrete	LF	47,211	47,431	47,431
SPV.0035.0100	EBS Excavation	CY	46,788	46,652	46,652
SPV.0035.0101	EBS Backfill	CY	46,549	46,413	46,413
SPV.0085.0200	Seeding Mixture Native Seed Butterfly Mix	LB	145	87	87
SPV.0180.0200	Topsoil Special	SY	383,676	368,317	368,317
SPV.0060.5000	Removing Hydrant	EACH	27	29	29
SPV.0060.5001	Install Hydrant	EACH	27	29	29
SPV.0090.5003	Ductile Iron Hydrant Branch 6-Inch	LF	339	361	361
SPV.0090.5004	Ductile Iron Water Main 6-Inch	LF	989	1,004	1,004
SPV.0090.5007	Ductile Iron Water Main 16-Inch	LF	5,100	5,469	5,469

SPV.0165.4710	Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP Pilot **P**	SF	180,144	199,433	199,433
SPV.0165.4740	Temp Wall Wire Faced Mechanically Stabilized Earth LRFD/QMP Pilot	SF	32,827	13,538	13,538

Added Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
203.0200.0017	Removing Old Structure (Station) 265EW+00	LS	0	1	1
511.1300.0020	Temporary Shoring (Location) 320NS+00 to 322NS+00	SF	0	2,497	2,497
632.0101	Trees(Species,Root,Size)0001.Buckeye, Homestead 1 ¾ - 2 Inch Cal	EACH	0	3	3
632.0101	Trees(Species,Root,Size)0003.Catalpa, Northern 1 ¾ - 2 Inch Cal	EACH	0	2	2
632.0101	Trees(Species,Root,Size)0005.Coffeetree, Kentucky B&B 1 ½ - 1 ¾ Inch Cal	EACH	0	2	2
632.0101	Trees(Species,Root,Size)0007.Hackberry, Common B&B 1 ¾ - 2 Inch Cal	EACH	0	2	2
632.0101	Trees(Species,Root,Size)0009.Honeylocust, Skyline 1 ¾ - 2 Inch Cal	EACH	0	3	3
632.0101	Trees(Species,Root,Size)0011.Oak, Heritage 1 ¾ - 2 Inch Cal	EACH	0	1	1
632.0101	Trees(Species,Root,Size)0013.Oak, Swamp White B&B 2 ½ Inch Cal	EACH	0	2	2
632.0101	Trees(Species,Root,Size)0015.Oak, Bur B&B 2 ½ Inch Cal	EACH	0	3	3
632.0101	Trees(Species,Root,Size)0017.Locust, Black Purple Robe Black 1 ¾ - 2 Inch Cal	EACH	0	1	1
632.0101	Trees(Species,Root,Size)0019.Basswood, American1 ¾ - 2 Inch Cal	EACH	0	2	2
632.0101	Trees(Species,Root,Size)0021.Elm, Jefferson 1 ¾ - 2 Inch Cal	EACH	0	4	4
632.0101	Trees(Species,Root,Size)0023.Elm, Accolade 1 ¾ - 2 Inch Cal	EACH	0	3	3
632.0101	Trees(Species,Root,Size)0025.Crabapple, Prairifire B&B 1 ¾ - 2 Inch Cal	EACH	0	5	5
632.0101	Trees(Species,Root,Size)0027.Crabapple, Robinson B&B 1 ¾ - 2 Inch Cal	EACH	0	9	9
632.0101	Trees(Species,Root,Size)0029.Hawthorn, Thornless Cockspur B&B 1 ¾ - 2 Inch Cal	EACH	0	3	3
632.0101	Trees(Species,Root,Size)0031.Redcedar, Eastern B&B 5' Ht	EACH	0	7	7
632.0101	Trees(Species,Root,Size)0033.Spruce, Norway B&B 5' Ht	EACH	0	6	6
632.0101	Trees(Species,Root,Size)0035.Spruce, White B&B 6' Ht	EACH	0	15	15
632.0101	Trees(Species,Root,Size)0037.Dogwood Corneliancherry B&B 1 ½ Inch Cal	EACH	0	9	9
SPV.0060.0153	Sign Support Special Mounting	EACH	0	2	2
SPV.0060.5106	Abandoning MMSD Sanitary Manhole	EACH	0	1	1
SPV.0060.5109	MMSD Sanitary Sewer Manhole, 48-Inch	EACH	0	1	1
SPV.0060.5110	MMSD Sanitary Manhole Vacuum Test	EACH	0	1	1
SPV.0090.5120	Abandoning Sanitary Sewer, 24-Inch	LF	0	184	184

SPV.0060.5014	Bentonite Trench Dam	EACH	0	2	2
SPV.0090.5013	Ductile Iron Water Main 16-Inch Restrained Joint W/Backfill Slurry	LF	0	71	71
SPV.0090.5014	Steel Casing W/Ductile Iron 16-Inch Carrier W/Backfill Slurry	LF	0	275	275

Deleted Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
632.0101	Trees(Species,Root,Size)0001.Coffeetree Kentucky B&B 2 ½ –Inch Cal	EACH	2	0	0
632.0101	Trees(Species,Root,Size)0003.Hackberry Common B&B 2 ½ - Inch Cal	EACH	2	0	0
632.0101	Trees(Species,Root,Size)0005.Maple Freeman Armstrong B&B 2 ½ - Inch Cal	EACH	4	0	0
632.0101	Trees(Species,Root,Size)0007.Maple Morton Miyabe B&B 2 ½ - Inch Cal	EACH	3	0	0
632.0101	Trees(Species,Root,Size)0009.Oak Swamp White B&B 2 ½ - Inch Cal	EACH	4	0	0
632.0101	Trees(Species,Root,Size)0011.Oak Bur B&B 2 ½ - Inch Cal	EACH	3	0	0
632.0101	Trees(Species,Root,Size)0013.Crabapple Prairifire B&B 2-Inch Cal	EACH	5	0	0
632.0101	Trees(Species,Root,Size)0015.Crabapple Red Baron B&B 2-Inch Cal	EACH	6	0	0
632.0101	Trees(Species,Root,Size)0017.Hawthorn Thornless Cockspur B&B 2-Inch Cal	EACH	3	0	0
632.0101	Trees(Species,Root,Size)0019.Redcedar Eastern B&B 5-Foot Ht	EACH	7	0	0
632.0101	Trees(Species,Root,Size)0021.Spruce Colorado Green B&B 5-Foot	EACH	15	0	0
632.0101	Trees(Species,Root,Size)0023.Spruce Hoops Blue Colorado B&B 5-Foot Ht	EACH	6	0	0
632.0101	Trees(Species,Root,Size)0025.Dogwood Corneliancherry B&B 6-Foot Ht	EACH	14	0	0
632.0101	Trees(Species,Root,Size)0027.Viburnum Little Joe 24-Inch CG	EACH	36	0	0
SPV.0060.0012	Removing Grout Pipe	EACH	7	0	0
SPV.0165.4740	Temp Wall Wire Faced Mechanically Stabilized Earth LRFD/QMP Pilot	SF	19,289	0	0

Plan Sheets

Revised Plan Sheets	
Plan Sheet	Plan Sheet Title (brief description of changes to sheet)
6,577	Removed Ramp WE Grading
294,311,574,593	Added Bluemound Watermain
308	Added 76th Street Pier Removal
599,1148	Added Bluemound Watermain
644,1583	Added Temporary Shoring
758	Added abandon Sanitary Sewer

773	Revised Burleigh Water Booster Station
831-832,1756	Revised Berm Landscaping
898,1774-1790	Revised Sign to Ground Mount, Revised Quantities
936	Removed Rebar Detail Table
1112-1123	Revised Fixed Message Sign Border Detail
1143	Removed Ramp WE Grading and added Bluemound Watermain
1151,1419	Removed Ramp WE Grading
1493,1495-1497,1500	Added Bluemound Watermain
1501,1655	Added 76th Street Pier Removal
1504	Removed Grout Pipe Removal
1505-1506,1511	Added Bluemound Watermain
1540-1543	Removed Ramp WE Grading and Revised Petroleum and Reuse Earthwork Quantities
1544,1547,1556,1560	Added Bluemound Watermain
1652-1653	Added DNR Forestry Staging Site
1659-1661,1663-1664,1666	Removed Ramp WE Grading
1667-1669	Removed Ramp WE Grading and added Bluemound Watermain
1693-1694,1702-1703	Removed Ramp WE Grading
1856-1865	Added Bluemound Watermain
3406,3418,3419, 3499,3561	Revised Petroleum and Reuse Earthwork Quantities

Added Plan Sheets	
Plan Sheet	Plan Sheet Title (brief description of why sheet was added)
761A,761B	Added Abandon Sanitary Sewer
774A,774B	Added Bluemound Watermain
1412A	Added DNR Forestry Staging Site
1428A	Added Bluemound Watermain
1860A,1865A	Added Bluemound Watermain

Deleted Plan Sheets	
Plan Sheet	Plan Sheet Title (brief description of why sheet was deleted)
533,602	Removed Ramp WE Grading
3428, 4630-4638	Removed Ramp WE Grading

Other

Note: All added Bid Items are listed starting with Line No. 7000. There were no additions to Option A or Option B.

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

Sincerely,

Mike Coleman

Proposal Development Specialist
Proposal Management Section

ADDENDUM NO. 2

1060-33-80

August 12, 2014

Special Provisions

4. Prosecution and Progress.

Replace entire language under **Section 1 and Section 2 (East Leg), Stage 1A Construction** with the following:

Section 1 and Section 2 (East Leg)

Stage 1A Construction:

Freeway and Ramp Construction

- Begin construction of B-40-852, B-40-857 and B-40-891
- Begin construction of R-40-511, R-40-514, R-40-546, R-40-548, R-40-557 and R-40-560
- Begin Ramp NW roadway construction
- Construct northbound widening NSC
- Remove portion of B-40-106
- Remove B-40-88
- Construct storm sewer Z4000, P4000A, Z4001, P4001A, Z4002, P4002A, Z4004, P4005, Z4007, P4007A, Z4016, and P4017 prior to B-40-891 and R-40-501 construction
- Construct storm sewer Z7654 through Z7687A prior to R-40-557 construction
- Construct storm sewer by tunnel excavation from Z2822 through Z2815
- Construct storm sewer Z6124 through Z6086 through P6198A prior to wall R-40-548 construction
- Construct storm sewer P7654E through P7686B with Backfill Controlled Low Strength from pipe invert to subgrade elevation for a width of 2 times the outside pipe diameter prior to wall R-40-557 construction
- Install water main crossing under US 45 south of Bluemound Road Station 321NS+30

Local Road Construction

W. Bluemound Road

- Remove B-40-129 and B-40-130
- Begin construction of B-40-866

W. Adler Street

- Reconstruct utilities

W. Chester Street

- Construct R-40-618
- Reconstruct utilities

S. 84th Street

- Coordinate and remove portion of B-40-93 for construction of storm sewer P6853 through Z6764

W. O'Connor Street

- Construct R-40-620

W. National Avenue

- Install CCTV-40-0209

W. Greenfield Avenue

- Install Landscaping on berm south of Greenfield Ave.

Replace entire language under **Contractor Coordination** with the following:

Contractor Coordination
Provide an individual to serve as the contractor's sole point of contact for field utility coordination and communication for the duration of the project.
SEF Rev. 13_1107

Contract ID 1060-33-72, Zoo IC - Watertown Plank Road Interchange reconstruction from Wisconsin Avenue to Underwood Parkway. The WisDOT contact is Jeff Bohen at (414) 750-2928; jeff.bohen@dot.wi.gov. This contract will permanently close the US45 southbound exit ramp to Wisconsin Avenue. Coordinate with this project to determine the exact date and time for the closure. Anticipated closure date for the ramp is December 1, 2014.

To minimize service outages during construction the existing 16-inch water main east of 92nd Street bridge, between W. Chester Street and Adler Street, shall not be shut off or abandoned prior to the replacement and establishment of the new 16-inch water main loop serving the area. The following water main work and associated water services shall be installed, tested, connected, and in service as part of the new 16-inch water main loop;

- In W. Adler Street, from S. 91st Street to S. 95th Street;
- In W. Chester Street, from S. 92nd Street to S. 91st Street Extended water main;
- In S. 91st Street extended water main, from W. Chester Street to W. Adler Street.

The existing 12-inch water main crossing the highway at S. 87th Place extended shall remain in service until the aforementioned work is completed. Simultaneous water main shutoffs at S. 87th Place extended and the 92nd Street bridge are prohibited. Contact Josh Iwen, (414) 286-3640, of City of Milwaukee - Water ten business days in advance to coordinate outages of their facilities. Staging changes are not allowed unless reviewed by Milwaukee Water Works and approved by the engineer.

The City of Milwaukee has an existing 16-inch water main crossing IH 94 near S. 92nd Street at Station 211EW+02 and an existing 12-inch water main crossing IH 94 near S. 88th Street at Station 224EW+87. Both crossings will be reconstructed as shown in the plans. Only one of these crossings can be taken out of service at a time. Reconstruct and adjust the water mains as shown in the plans. Contact Josh Iwen, (414) 286-3640, of City of Milwaukee - Water ten business days in advance to coordinate outages of their facilities.

To minimize service outages to the Milwaukee County Zoo during construction, the existing 16-inch water main just south of Bluemound Road, Station 321NS+30(Bluemound Watermain), shall not be shut off or abandoned prior to the replacement and establishment of the new 16-inch water main at this location. The existing 24-inch water main crossing the highway 780 feet south of Bluemound Road at Station 314+35NS (Zoo Watermain)shall remain in service until the aforementioned work is completed. Simultaneous water main shutoffs of the Bluemund Watermain and the Zoo Watermain are prohibited. Shutoffs will only be allowed to cut over the new main into the existing for both the Bluemound Watermain and the Zoo Watermain. Contact Josh Iwen (414-286-3640) of City of Milwaukee - Water ten business days in advance to coordinate outages of their facilities. Staging changes are not allowed unless reviewed by Milwaukee Water Works and approved by the Project Engineer.

The City of Wauwatosa has an existing 24-inch water main crossing US45 near Wisconsin Ave at Station 335NS+60. This crossing will be reconstructed as shown in the plans only after the Temporary Booster Station at Burleigh Road is installed and approved by the City of Wauwatosa.

Contact Jim Wojcehowicz(414-479-8963) of the City of Wauwatosa Water ten business days in advance to coordinate outages of their facilities.

The City of Milwaukee Water Utility staff will inspect the construction of water main under this contract. Notify Steve Brengosz, (414) 708-2808, or Mark Scheller,(414) 286-2427, for materials inspection and the City of Milwaukee Construction Section. (414) 286-2497, for installation inspection four business days prior to starting construction.

The existing Adler Water Booster Station near Adler Street and S. 87th Place that is being relocated to Adler and S. 85th Street as shown in the plans. A City of Milwaukee communications duct package serving this booster station crosses IH 94 as an attachment to the S. 92nd Street structure and then runs easterly along the north curb line of W. Adler Street to the existing booster station. This duct package cannot be disturbed until communications can be re-established to the station from the east along S. 84th Street and Adler Street as follows: Construct, reconstruct and adjust City of Milwaukee communications facilities along O'Connor Street, S. 84th Street and Adler Street as shown in the plans. Upon completion of the communications facilities in the S. 84th Street area, City of Milwaukee staff will splice the reinstalled cable and fiber lines. Allow 30 calendar days for City of Milwaukee staff to complete the splicing. Coordinate construction activities with City of Milwaukee. Provide written notice to Brian Pawlak, (414) 286-5970, of the City of Milwaukee 10 business days in advance to coordinate construction activities. Communications to the existing Adler Water Booster Station must be maintained at all times, including during the construction, testing and approval of the Relocated Booster Station.

An existing City of Milwaukee - Communications manhole at Station 741FA+04, 9 feet LT is in poor condition. Reconstruct this manhole as shown in the plans prior to the reconstruction of the O'Connor Street Water Main also show in the plans.

City of Milwaukee has an existing communications line attached below the Bluemound Road structure over USH 45. Construct, reconstruct and adjust the communications facilities at Bluemound Road and USH 45 as shown in the plans. City of Milwaukee staff will splice the reinstalled communications lines. Allow 30 calendar days for City of Milwaukee staff to complete the splicing. Coordinate construction activities with City of Milwaukee. Provide written notice to Brian Pawlak, (414) 286-5970, of the City of Milwaukee ten business days in advance to coordinate construction activities.

Coordinate traffic signal reconstruction at N. 95th Street and Bluemound Road and at N. 97th Street and Bluemound Road with the City of Milwaukee – Signals staff. The City of Milwaukee will remove the signals at these two intersections and will reinstall signals at N. 95th Street and Bluemound Road. Allow 5 calendar days for City staff to perform signal removals and 5 calendar days for signal installation. Provide written notice to Joseph Blakeman, (414) 286-8070, or Al Nichols. (414) 286-3686, of the City of Milwaukee 10 business days in advance to coordinate construction activities.

A City of Wauwatosa sanitary sewer will be reconstructed near 97th Street and Wisconsin Avenue. Reconstruction of that portion of the sewer crossing Wisconsin Avenue between a manhole at Station 24WX+49, 23' RT and an MMSD manhole at Station 24WX+49, 10' LT must be completed in 7 calendar days. Reconstruction of this portion of sewer must be performed during off peak hours. Construct the sanitary sewer as shown in the plans.

AT&T Wisconsin has transite conduit packages attached below the S. 92nd Street structure over IH 94, and attached below the Bluemound Road and Wisconsin Avenue structures over USH 45. They will remove the transite conduit in conjunction with the structure demolition. Allow AT&T Wisconsin two nights in each location to complete their removals. Provide the necessary traffic control devices and lane closures for them to complete their work. Lane rental assessments will apply to these closures. Provide written notice to Jay Bulanek, (414) 535-7407 office, of AT&T Wisconsin 21 business days in advance to coordinate transite removal activities.

American Transmission Company will be constructing overhead electric transmission towers and pulling new overhead circuits during construction. Once temporary barrier is placed in Stage 1A for the east to north ramp from Station 810BB+69, 26' LT to Wisconsin Avenue but before Stage 1B, allow American Transmission Company 5 business days to install the foundation at Station 811BB+79, 28' LT. Contact William Aeschbacher, (262) 506-6918 office / (262) 364-8356 cell, of We Energies 10 business days in advance to coordinate foundation work.

We Energies - Electric has an underground electric duct package running in the median of S. 84th Street, crossing IH 94 at Station 237EW+85, and an overhead pole line that runs along the east side of S. 84th Street which crosses IH 94 at Station 238EW+11 that cannot be taken out of service simultaneously. We Energies will place all underground conductors in the duct package to the overhead line prior to construction. Once the existing box culvert has been removed and the proposed storm sewer (P6765) crossing S. 84th Street has been installed, allow We Energies 30 calendar days to re-establish their underground duct package, install electric cable, and perform associated splice work. After the completion of the re-establishing of underground electric feeders, allow We Energies 15 calendar days to remove the overhead electric lines crossing IH 94. Contact Amy Plato, (414) 385-6149 office / (414) 335-7543 cell, of We Energies ten business days in advance to coordinate outages of their facilities.

We Energies - Electric has transite conduit packages attached below the S. 92nd Street structure over IH 94, and attached below the Bluemound Road and Wisconsin Avenue structures over USH 45. They will remove the transite conduit in conjunction with the structure demolition. Allow We Energies two nights in each location to complete their removals. Provide the necessary traffic control devices and lane closures for them to complete their work. Lane rental assessments will apply to these closures. Provide written notice to Amy Plato, (414) 385-6149 office / (414) 335-7543 cell, of We Energies 21 business days in advance to coordinate transite removal activities.

Replace entire language under **Closure Restrictions** with the following:

Closure Restrictions

Full closure and detouring of freeway roads will be restricted to Full Roadway Closure Hours unless otherwise specified. The freeway may be closed to facilitate the removal of structures and erection of girders, storm sewer trunk line crossings, to perform work related to major traffic shifts and other work approved by the engineer. Provide signed detour routes, as shown in the plans, fully open and free of construction during all full roadway and system ramp closures.

To minimize the total number of full roadway closures for girder erection, bridge demolition activities and water main crossing, the contractor is allowed extended full roadway closures between 10:00 PM and 5:00 AM Sunday through Thursday nights and between 11:00 PM and 7:00 AM for Friday and Saturday nights. A full roadway closure is defined as one direction of the freeway. Closing both directions of the freeway constitutes using two full roadway closures. A total of forty-two extended full roadway closures are allowed. Bridge superstructure demolition activities will require a full roadway closure in both directions. Lane rental assessments will apply to these closures. These closures are to be utilized only for bridge demolition and, girder erection activities, and water main crossing for the following locations:

- Bluemound Road demolition and reconstruction
- Wisconsin Avenue demolition
- 92nd Street demolition and reconstruction
- SW ramp demolition
- 73rd Street pedestrian bridge demolition
- US 45 northbound temporary bridge over I-94 eastbound
- US 45 northbound temporary bridge over I-94 westbound
- Bluemound Road Water main Crossing, Station 321NS+30

Do not close long term Bluemound Rd over USH 45 prior to October 16, 2014, or as directed by the engineer.

Do not close long term the northbound exit ramp to W. Wisconsin Avenue prior to October 16, 2014, or as directed by the engineer.

Do not close any freeway lanes long-term prior to October 16, 2014, or as approved by the engineer.

Do not begin the removal of B-40-106 prior to February 1, 2015, or as approved by the engineer.

Complete the landscaping work, including but limited to, tree planting, seeding and mulch, and sodding along the berm south of Greenfield Avenue prior to November 21, 2014.

Do not close long term the existing Ramp SW prior to March 14, 2015, or as approved by the engineer.

Do not close long term the existing Ramp ES prior to March 14, 2015, and prior to the completion of all of the work necessary to activate dynamic message sign mounted on S-40-443, or as approved by the engineer.

Do not close long term Wisconsin Avenue until Bluemound Road is fully reopened to two traffic lanes in each direction including sidewalks.

Do not close long term 84th Street and the westbound exit and entrance ramp at 84th Street as shown in Stage 1A prior to October 16, 2014, or as approved by the engineer.

Do not close long term 92nd Street until 84th Street is reopened to traffic in each direction.

Do not close long term the eastbound exit ramp to S. 84th Street prior to March 1, 2016, or as approved by the engineer.

Do not close long term W. Kearney Street prior to March 1, 2016, or as approved by the engineer.

Do not close the I-94 westbound exit ramp to S. 84th Street and the I-94 westbound exit ramp to STH 100 at the same time.

Do not close the eastbound entrance ramp from 84th Street and the eastbound entrance ramp from STH 100 at the same time.

Do not move to Stage 3 in Section 2 (East Leg) until the I-94 westbound exit ramp to S. 84th Street is open to traffic.

All ramps at 84th Street shall be open to traffic during the Wisconsin State Fair, August 6, 2015 through August 16, 2015. Do not close the 84th Street westbound exit ramp after the 2015 State Fair other than during hours allowed in the lane rental table or within other areas of the prosecution and progress.

Do not close the westbound entrance ramp from 84th Street and the westbound entrance ramp from 70th Street at the same time.

IH 94 WEST may be closed between 70th Street and 84th Street for a onetime only continuous closure of IH 94 WEST within the weekend timeframe of 11:00 PM Friday night to 6:00 AM Sunday morning or 11:00 PM Saturday night to 5:00 AM Monday morning to facilitate the installation of storm sewer pipes P6652 & P6663 and storm sewer structure Z6661. Lane rental assessments will apply to this closure.

Ramp NW may be closed for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of Pier 1 of B-40-855. It is anticipated this closure will take place after IH 94 westbound traffic is shifted to temporary road EWD. Do not overlap the NW ramp seven calendar day closure with the allowed seven calendar day closure of the WN ramp. Lane rental assessments will not apply to this seven calendar day closure, but any additional closures needed to facilitate construction of Pier 1 of B-40-855 will require the use of lane rental credits or lane rental assessments.

Ramp WN may be closed for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of temporary road NEA adjacent to existing USH 45 northbound roadway. Do not overlap the WN seven day closure with the allowed seven day closure of the NW ramp. Lane rental assessments will not apply to this seven calendar day closure.

The eastbound I-94 exit ramp to 84th Street may be closed in Section 2, Stage 2 for a onetime only period not to exceed seven consecutive calendar days to facilitate construction of storm sewer pipes P6354 and P6370A and drainage structures Z6370 and Z6374 located in that ramp. This closure will not be allowed during the State Fair. Lane rental assessments will not apply to this seven calendar day closure.

The westbound I-94 exit ramp to 84th Street southbound may be closed in Section 2, Stage 4A or 4B for a onetime only period within the weekend timeframe of 11 PM Friday night to 5:00 AM Monday morning to facilitate construction of concrete pavement located at the intersection of 84th Street and that ramp. Lane rental assessments will apply to this closure.

The westbound Watertown Plank Road entrance ramp to southbound US 45 may be closed in Section 1, Stage 4 for a onetime only period not to exceed 21 consecutive calendar days to facilitate construction of that ramp. Lane rental assessments will not apply to this 21 calendar day closure

The eastbound HWY100 entrance ramp to eastbound IH 94 may be closed in Section 1, Stage 2A for a onetime only period not to exceed 60 consecutive calendar days to facilitate construction of that ramp. Lane rental assessments will not apply to this 60 calendar day closure

Ramp SW steel erection operations over IH 94 west are allowed a onetime only continuous closure of IH 94 west within the weekend timeframe of 11:00 PM Friday night to 6:00 AM Sunday morning or 11:00 PM Saturday night to 5:00 AM Monday morning. Lane rental assessments will apply to this closure.

Ramp SW steel erection operations over IH 94 east and USH 45 south are allowed a onetime only continuous closure of IH 94 east and USH 45 south within the weekend timeframe of 11:00 PM Friday night to 5:00 AM Monday morning. This closure will not be allowed at the same time as the steel erection operations over IH 94 West. Lane rental assessments will apply to this closure.

Open the Southbound US45 exit ramp to Bluemound Road prior to September 4, 2015.

Eastbound IH 94 between 84th and the east end of the project may be reduced to two through lanes to facilitate roadway construction between Station 276EW+75 and Station 285EW+00. This closure will be allowed during Section 2 (East Leg) Stage 5, shall not take place prior to March 15, 2016 and shall not exceed 42 calendar days in duration.

Do not begin or continue any work that closes traffic lanes or ramps outside the allowed time periods specified in this contract. If the contractor fails to open freeway lanes of traffic and/or ramps to traffic by the specified times, assessments shown in the Lane Rental Assessment Table in the article Lane Rental Assessment will be placed upon the contractor based on the hourly rental rate for the closure type and hourly definition that the non-compliant closure occurs. The total assessment to the

contractor will be the summation of the separate assessments for each lane and each ramp closure violation.

Permitting the contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the department of any of its rights under the contract.

8. Utilities.

Remove entire article language and replace with the following:

This contract comes under the provisions of Administrative Rule TRANS 220.

Additional information regarding recently relocated utility facilities may be available on permits issued to the utility companies. These permits can be viewed at the Region Office during normal working hours. Contact WisDOT SE Freeways Utility Coordinator Douglas Gendron at (414) 750-4362 for further information.

Underground and overhead utility facilities are located within the project limits. Utility adjustments are required for this construction project as noted below. Coordinate construction activities with a call to Diggers Hotline or a direct call to the utilities that have facilities in the area as required per state statute. Use caution to ensure the integrity of underground facilities and maintain code clearances from overhead facilities at all times.

Some utility work, as described below, is dependent on prior work being performed by the contractor at a specific site. Provide the engineer and the affected utility a good faith notice of when the utility is to start work at the site. Notice shall be given 14 to 16 calendar days in advance of when the site will be available to the utility. Follow up with a confirmation notice to the engineer and the utility not less than 3 working days before the site will be ready for the utility to begin its work.

Contact utility companies listed in the plans prior to preparing bids to obtain current information on existing utility locations and the status of any new utility relocation work.

Utility companies will be performing utility work and adjustments within the limits and during the life of the project. The contractor shall cooperate and coordinate construction activities with these companies.

There may be abandoned utility facilities within the project limits. If a conflict with an abandoned utility facility is encountered, contact the appropriate utility owner/representative to coordinate construction activities and proper removal and disposal of said facility as necessary.

Utility working days shown herein are as defined in Wisconsin Administrative Code Chapter Trans 220.

Known utilities in the projects are as follows:

AT&T Corporation has existing underground communications facilities within the project limits in the following locations:

- An underground communications package beginning from beyond the easterly project limits running westerly along the north fence line of IH 94 to a handhole at Station 786TMD+95, 20’RT, where it turns and runs northerly along the east side of 70th Street to a handhole 200’ north of O’Connor Street. From there it turns and runs westerly in the ATC/We Energies transmission corridor to the 96th Street Substation located in the northeast quadrant of the Zoo Interchange. From this point the line runs southwesterly along the east property line of

the 96th Street Substation, crossing IH 94 at Station 198EW+05, and continues southwesterly to the Hank Aaron State Trail. From there it turns and runs westerly in the Hank Aaron State Trail to Station 130EW+35, 108'RT where it turns and runs westerly along the south right of way of IH 94 to Station 121EW+70, 96'RT. From there it turns and runs southwesterly along the south right of way of IH 94 to Station 95EW+71, 140'RT where it turns and runs northerly, crossing IH 94 at Station 95EW+71, to Station 95EW+71, 148'LT. From there it turns and runs westerly along the north right of way of IH 94 to beyond the westerly project limits. This line will remain in place without adjustment.

- An underground communications package beginning at a handhole at Station 299EW+01, 81'RT running southerly in S. 66th Street to the Hank Aaron State Trail where it turns and runs westerly in the Hank Aaron State Trail to Station 184HA+13, 33'LT. From there it turns and runs southwesterly to a handhole at Station 783GE+70, 24'LT where it turns and runs southerly along the east fence line of USH 45/IH 894 to beyond the southerly project limits. AT&T Corporation will abandon this line in place from Station 784GE+65, 149'RT to Station 767GA+21, 13'LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground communications package beginning at the 96th Street Substation in the northeast quadrant of the Zoo Interchange at Station 803FH+32, 297'LT running southwesterly to Station 802FH+00, 63'LT where it turns and runs northwesterly to Station 525EN+69, 157'RT. From there it turns and runs westerly, crossing USH 45 at Station 299NS+93, to Station 490NW+07, 62'RT where it turns and runs southwesterly to Station 485NW+32, 41'RT. AT&T Corporation no longer occupies this facility however WisDOT FTMS has facilities occupying this conduit package. WisDOT FTMS will remove these facilities prior to December 31st, 2014.

AT&T Corporation will construct a new underground communications package prior to construction beginning at Station 784GE+65, 149'RT running southerly along the east right of way of USH 45/IH 894, crossing Schlinger Avenue near Station 531SCH+64, and continues southerly to Station 768GE+00, 56'RT. From there it turns and runs southwesterly to Station 784GE+65, 75'LT.

AT&T Corporation also has an abandoned conduit package within the project limits in the following locations:

- An underground communications package beginning at a handhole at Station 786TMD+95, 20'RT and running westerly along the south side of the northerly fence of IH 94, crossing S. 84th Street at Station 42F+14 and crossing S. 92nd Street at Station 66TJ+35, and continues westerly to Station 802FH+00, 63'LT.
- An underground communications package beginning at Station 485NW+32, 41'RT running westerly along the north fence of IH 94 to Station 558SA+91, 19'LT where it turns and runs northwesterly to Station 577SS+85, 101'RT. From there it turns and runs westerly, crossing HWY 100 at Station 577SS+85, and continues westerly along the north fence of IH 94 to Station 95EW+70, 148'LT.
- An underground communications package beginning from beyond the easterly project limits running westerly along the north side of the south fence of IH 94, crossing S. 84th Street at Station 38F+96 and S. 92nd Street at Station 63TJ+77, to Station 800FC+00, 0'LT where it turns and runs southwesterly along the easterly right of way of USH 45/IH 894 to Station 783GE+70, 24'LT.
- An underground communications package beginning at a handhole at Station 530SCH+34, 24'LT and running westerly along the north side of Schlinger Avenue to beyond the westerly project limits.

Contact Ken Nine (574-904-6336 cell) of JMC Engineers & Associates, Inc. 7 days in advance to coordinate locations and any excavation near their facilities.

AT&T Wisconsin has underground and overhead communication facilities within the project limits in the following locations:

- An overhead communications line beginning from beyond the southerly project limits of the UPRR Berm running northerly on We Energies poles along the west side of IH 894 / USH 45 to a pole at Station 228NS+64, 198'LT. AT&T Wisconsin will relocate to new We Energies poles along the west right of way of IH 894 / USH 45 prior to construction.
- An overhead communications line beginning from beyond the southerly project limits running northerly on We Energies poles along the east right-of-way of IH 894 / USH 45 to a pole at Station 278NS+85, 275'RT. This line will remain in place without adjustment.
- An overhead communications line beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running northerly on We Energies poles along the east right-of-way of USH 45 to a pole at Station 318NS+15, 109'RT where it turns and runs easterly to beyond the easterly project limits. AT&T Wisconsin will relocate this line prior to construction.
- An underground communications line beginning from beyond the westerly project limits of Bluemound Road running easterly, crossing USH 45 on the Bluemound Road Structure at Station 323NS+06, to beyond the easterly project limits of Bluemound Road. The conduit from a manhole at Station 194BL+79, 17'LT to Station 202BL+86, 20'LT is composed of transite material and it will be removed by AT&T Wisconsin in conjunction with the demolition of the Bluemound Road structure and pavement removal. Allow AT&T Wisconsin 2 working days to perform removal of the transite conduits on the structure and 3 working days once the pavement has been removed in the areas east and west of the existing structure. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 21 days prior to the demolition of the structure to coordinate removal. AT&T Wisconsin will also lower and adjust this line from Station 191BL+20, 16' LT to a manhole at Station 192BL+05, 17' LT prior to construction. AT&T Wisconsin will also adjust this line at Station 192BL+62, 17' LT during construction. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 7 days prior to the pavement removal in this location and allow AT&T Wisconsin 1 day to complete the adjustment. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning from beyond the westerly project limits of Wisconsin Avenue running easterly, crossing USH 45 on the Wisconsin Avenue Structure at Station 334NS+66, to beyond the easterly project limits of Wisconsin Avenue. AT&T Wisconsin will relocate this line from a manhole at Station 25WX+26, 34'LT to a manhole at Station 32WX+56, 34'LT during construction and prior to the demolition of the Wisconsin Avenue structure. The conduit from a manhole at Station 25WX+26, 34'LT to a manhole at Station 32WX+56, 34'LT is composed of transite material and it will be removed by AT&T Wisconsin in conjunction with the demolition of the Wisconsin Avenue structure and removal of pavement. Allow AT&T Wisconsin 2 working days to perform removal of the transite conduits on the structure and 3 working days once the pavement has been removed in the areas east and west of the existing structure. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 21 days prior to the demolition of the structure to coordinate removal. AT&T Wisconsin will also adjust this line at Station 24WX+34, 34' LT and at Station 33WX+00, 30' LT during construction. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 7 days prior to the pavement removal in this location and allow AT&T Wisconsin 1 day to complete the adjustment. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning from beyond the westerly project limits of Wisconsin Avenue running easterly along the north right of way of Wisconsin Avenue to Station 24WX+77, 91' LT where it turns and runs northerly along the west right of way of USH 45 to Station 743WC+50, 27' RT where it turns and runs northwesterly to beyond the westerly project limits. AT&T Wisconsin will relocate this line from Station 340NS+86, 150' LT to beyond the westerly project limits prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 153EW+57, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground communications line beginning from beyond the westerly Adler Street limits running easterly along the south side of Adler Street to Station 995AD+01, 32'RT where it

turns and runs southerly to beyond the southerly project limits of S. 92nd Street. This line will remain in place without adjustment.

- An underground communications line beginning from beyond the southerly project limits of S. 92nd Street running northerly, crossing IH 94 at Station 210EW+18, to a manhole at Station 66TJ+61, 32'LT. The conduit from a manhole at Station 63TJ+61, 32'LT to Station 66TJ+61, 32'LT is composed of transite material and it will be removed by AT&T Wisconsin in conjunction with the demolition of the 92nd Street structure and removal of pavement. Allow AT&T Wisconsin 2 working days to perform removal of the transite conduits on the structure and 3 working days once the pavement has been removed in the areas north and south of the existing structure. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 21 days prior to the demolition of the structure to coordinate removal. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning at a manhole at Station 66TJ+61, 32'LT running westerly to a pedestal located at Station 49CH+06, 43'RT where it continues westerly to a pole located at Station 48CH+20, 34'RT. From there it rises up the pole and crosses Chester Street overhead to a pole at Station 48CH+20, 26'LT and beyond the northerly project limits of Chester Street. AT&T Wisconsin will abandon this line in place within the project limits prior to construction.
- An underground communications line beginning at a manhole at Station 66TJ+61, 32'LT running easterly along the south side of Chester Street to a pedestal at Station 821FH+38, 40' RT. AT&T Wisconsin will abandon this line in place prior to construction.
- An overhead communications line beginning from beyond the project limits of Adler Street running easterly, crossing Adler Street at Station 1020AD+47, to a pole located at Station 1021AD+17, 116'LT. From there it turns and runs southerly, crossing Adler Street at Station 1022AD+61, to a pole at Station 1022AD+80, 37'RT. From there it turns and runs easterly underground along the south side of Adler Street to Station 1023AD+78, 36'RT where it turns and runs southerly to beyond the southerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning beyond the southerly project limits running northerly in the northbound lanes of 84th Street to beyond the northerly project limits. AT&T Wisconsin will remove a transite duct from a manhole at Station 44+76, 35' RT to Honey Creek Parkway prior to construction. AT&T Wisconsin will also lower this line from a manhole at Station 44+76, 35' RT to Station 45F+50, 35' RT and at Station 47F+65, 37' RT prior to construction. Contact Jay Bulanek (414-535-7407) of AT&T Wisconsin 10 working days prior to the removal of the existing box culvert and installation of storm sewer pipe P6827 in 84th Street. AT&T Wisconsin will reconnect this communication line once the box culvert has been removed and storm sewer pipe P6827 has been installed. Allow AT&T Wisconsin 2 working days to complete their work. The remaining portions of this line will remain in place without adjustment.
- An underground communications line beginning from beyond the northerly project limits of O'Connor Street running southerly to a pedestal at Station 742FA+62, 37' LT where it turns and runs westerly to a pedestal at Station 740FA+64, 25'LT. AT&T Wisconsin will abandon this line in place prior to construction.
- An underground communications line beginning at a pedestal at Station 740FA+64, 25'LT running easterly along the north side of O'Connor Street to beyond the easterly project limits of O'Connor Street. This line will remain in place without adjustment.
- An underground communications duct package beginning beyond the southerly project limits running northerly, crossing IH 94 at Station 278EW+56, to beyond the northerly project limits. This line will remain in place without adjustment. Adjust foundations for walls N-40-70, N-40-71 and N-40-81 as necessary to avoid this duct package.
- An underground communications line beginning from beyond the easterly project limits of Burleigh Street running westerly in the median of Burleigh Street to beyond the westerly project limits. This line will remain in place without adjustment.

AT&T Wisconsin will relocate, construct and reconstruct communication facilities in the project area at the following locations prior to construction:

- A new underground communications line beginning at a manhole in Bluemound Road at Station 192BL+05, 19' LT running easterly in the westbound lanes of Bluemound Road to a manhole at Station 194BL+79, 17'LT where it turns and runs northerly down the middle of 97th Street to a manhole at Station 40TF+30, 1'RT. From there it turns and runs easterly, crossing USH 45 at Station 325NS+20, to a manhole located at Station 41TRN+54, 18'RT. From there it turns and runs southerly down the middle of 95th Street to a manhole in Bluemound Road at Station 202BL+86, 20'LT.
- A new underground communications line beginning at a manhole in Wisconsin Avenue at Station 25WX+26, 34'LT running southerly along the east side of S. 97th Street to a manhole at Station 47TF+08, 34'RT. From there it turns and runs easterly, crossing USH 45 at Station 331NS+54, to a manhole located at Station 47TRN+18, 18'RT. From there it turns and runs northerly in S. 95th Street to a manhole in Wisconsin Avenue at Station 32WX+56, 34'LT.
- A new underground communications line beginning from beyond the northerly project limits of Chester Street running southerly to Station 48CH+18, 6' LT where it turns and runs easterly in the westbound lanes of Chester Street to Station 51CH+92, 4' RT. From there it turns and runs northerly to beyond the northerly project limits of Chester Street.
- A new underground communications line beginning a manhole at Station 38F+71, 22' RT running northerly in the northbound lanes of S. 84th Street to a manhole at Station 44F+75, 34' RT.
- A new underground communications line beginning at a manhole at Station 38F+71, 22' RT running westerly to beyond the westerly project limits of S. 84th Street.

AT&T Wisconsin also has abandoned facilities within the project limits in the following locations:

- An underground communications line beginning beyond the southerly project limits running northerly, crossing IH 94 at Station 155EW+00, to beyond the northerly project limits.
- An underground communications line beginning at Station 987AD+34, 22'RT running northerly to Station 987AD+37, 27'LT where it turns and runs easterly on the north side of Adler Street to a manhole at Station 995AD+16, 16'LT.

Contact Jay Bulanek (414-535-7407 office) of AT&T Wisconsin 7 days in advance to coordinate locations and any excavation near their facilities.

American Transmission Company has overhead 138kv electric transmission lines within the project limits in the following locations:

- Two overhead 138kv electric transmission lines beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running northwesterly, crossing IH 94 between Station 125EW+00 to 126EW+50, to beyond the northerly project limits of IH 94. These lines will remain in place without adjustment.
- Three overhead 138kv electric transmission lines beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running southeasterly along the south side of IH 94 where they turn and runs northeasterly, crossing IH 94 between Station 171EW+35 to Station 174EW+78, and continue northeasterly, crossing USH 45 between Station 299NS+50 to Station 302NS+08, to 96th Street Substation in the northeast quadrant of the Zoo Interchange. These lines will remain in place without adjustment.
- Two overhead electric transmission lines beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running southerly, crossing IH 94 between Station 196EW+92 to Station 198EW+68, and continuing southerly along the east side of USH 45/IH 894 to beyond the southerly project limits. ATC will remove these lines and towers prior to and during construction. Contact Barbra Mikolajczyk (262-506-6804) of American Transmission Company to coordinate tower staging and construction activities.

- An underground electric transmission line beginning from beyond the northerly project limits running southerly in the median of S. 70th Street to beyond the southerly project limits. This line will remain in place without adjustment.

ATC will be constructing overhead electric transmission towers and pulling new overhead circuits prior to and during the project in the following locations:

South Leg (West Circuit)	South Leg (East Circuit)	North Leg Circuit
-Station 238NS+53, 195'RT	-Station 238NS+59, 294'RT	-Station 306NS+17, 524'RT
-Station 245NS+03, 130'RT	-Station 244NS+72, 220'RT	-Station 307NS+86, 354'RT
-Station 249NS+59, 105'RT	-Station 249NS+75, 179'RT	-Station 311NS+28, 195'RT
-Station 255NS+95, 106'RT	-Station 256NS+21, 181'RT	-Station 315NS+29, 186'RT
-Station 262NS+24, 108'RT	-Station 262NS+69, 183'RT	-Station 318NS+72, 174'RT
-Station 268NS+01, 111'RT	-Station 267NS+02, 185'RT	-Station 322NS+32, 215'RT
-Station 271NS+31, 112'LT	-Station 271NS+35, 187'LT	-Station 326NS+82, 206'RT
-Station 277NS+37, 142'LT	-Station 277NS+28, 217'LT	-Station 330NS+25, 172'RT
-Station 282NS+55, 225'LT	-Station 282NS+23, 288'LT	-Station 334NS+04, 256'RT
-Station 288NS+07, 399'LT	-Station 288NS+21, 517'LT	-Station 337NS+03, 397'RT
-Station 293NS+44, 578'LT	-Station 293NS+60, 707'LT	-Station 340NS+43, 329'RT
		-Station 343NS+86, 230'RT
		-Station 347NS+13, 161'RT
		-Station 349NS+75, 155'RT
		-Station 353NS+26, 239'RT
		-Station 355NS+95, 463'RT

Coordinate construction activities with ATC. Due to outage constraints for the multi-state electric grid, these transmission lines cannot be de-energized during construction. Use caution when operating overhead equipment in this area and maintain OSHA safe working clearance to the overhead conductors at all times. Notify ATC 48 hours before beginning any work within or around overhead electric transmission lines.

ATC also has abandoned underground electric lines within the project limits in the following locations:

- An underground 138kv electric transmission line beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running northeasterly, crossing the Hank Aaron State Trail at Station 130HA+65, to Station 143EW+44, 165'RT where it turns and runs southeasterly, crossing STH 100 at Station 568SN+81, to Station 169EW+62, 103'RT. From there it turns and runs northeasterly, crossing IH 94 in a We Energies tunnel at Station 171EW+15, and continues northeasterly, crossing USH 45 in a We Energies tunnel at Station 301NS+65, to 96th Street Substation in the northeast quadrant of the Zoo Interchange.
- An underground 138kv electric transmission line beginning at Bluemound Substation near the eastbound IH 94 off ramp to HWY 100 running northeasterly, crossing the Hank Aaron State Trail at Station 131HA+42, to Station 143EW+43, 196'RT, where it turns and runs southeasterly, crossing STH 100 at Station 568SN+11, to Station 169EW+82, 142'RT. From there it turns and runs easterly to Station 171EW+23, 112'RT where it turns and runs northeasterly, crossing IH 94 at Station 172EW+56, continues northeasterly, crossing USH 45 at Station 301NS+17, to 96th Street Substation in the northeast quadrant of the Zoo Interchange.

Contact Jim Briggs (414-651-1830) of American Transmission Company 7 days in advance to coordinate locations and any excavation near their facilities.

Midwest Fiber Network has existing underground communications line in a WisDOT conduit package beginning beyond the westerly project limits of Bluemound Road running easterly in the

median of Bluemound Road to a vault at Station 194BL+45, 8'LT where it turns and runs northeasterly, crossing Bluemound Road, to a vault at Station 196BL+40, 69'LT. From there it turns and runs northwesterly to a STOC cabinet at Station 196BL+11, 130'LT. Midwest Fiber network will remove this cable from the vault at Station 194BL+45, 8'LT to the STOC cabinet at Station 196BL+11, 130'LT prior to construction. The remaining portions of this line will remain in place without adjustment.

Prior to construction, Midwest Fiber Networks will construct a new line from a vault at Station 194BL+45, 8'LT running northeasterly, crossing Bluemound Road, to the north side of Bluemound Road where it turns and runs northerly to a manhole at Station 40+19, 39'LT. From there it turns and runs easterly, crossing USH 45 at Station 324NS+93, to a manhole at Station 41TRN+25, 48'LT. From there it turns and runs southerly along the west side of S. 95th Street, crossing Bluemound Road, and continues southerly along the west side of S. 95th Street to beyond the southerly project limits of S. 95th Street.

Contact Richard Trgovec (414-459-3554 office) of Midwest Fiber Network 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Cable has existing cable facilities in City of Milwaukee conduit within the project limits in the following locations:

- An underground cable in City of Milwaukee - Conduit beginning beyond the southerly project limits and running northerly in the southbound lanes of S. 68th Street to beyond the northerly project limits. This line will remain in place without adjustment.
- An underground cable in City of Milwaukee - Conduit beginning beyond the southerly project limits and running northerly along the west side of S. 76th Street to a manhole at Station 263EW+91, 186'RT where it turns and runs westerly in the westbound lanes of Kearney Street to a manhole at Station 755FB+19, 55'RT. From there it turns and runs northerly, crossing IH 94 at Station 255EW+31, to a manhole at Station 555CR+16, 4'LT where it turns and runs westerly along the north side of O'Connor Street to a manhole at Station 548CR+33, 20'LT. From there it continues westerly in the westbound lanes of O'Connor Street to a manhole at Station 741FA+04, 10'LT where it turns and runs northerly to a manhole at Station 740FA+51, 247'LT. From there it turns and runs westerly through the Milwaukee Firehouse to a manhole in S. 84th Street at Station 45F+51, 12'LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning at a manhole at Station 548CR+33, 20'LT and running northerly along the west side of S. Honey Creek Drive to beyond the northerly project limits of O'Connor Street. This line will remain in place without adjustment.
- An underground cable in City of Milwaukee - Conduit beginning at a manhole at Station 741FA+03, 8'LT and running westerly to a manhole at Station 42F+29, 11'LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning beyond the northerly project limits and running southerly in the southbound lanes of S. 84th Street to a manhole at Station 36F+82, 20'LT where it turns and runs westerly in the westbound lanes of Adler Street to an manhole at Station 995AD+68, 28'LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning beyond the northerly project limits and running southerly in the northbound lanes of S. 92nd Street, crossing IH 94 on the S. 92nd Street Structure, to a manhole at Station 995AD+68, 28'LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground cable in City of Milwaukee - Conduit beginning beyond the easterly project limits of Bluemound Road and running westerly in the median of Bluemound Road to a manhole at Station 203BL+48, 7'LT where it turns and runs southerly to Station 203BL+32, 36'RT. From there it turns and runs westerly in the eastbound lanes of Bluemound Road, crossing USH 45 on the Bluemound Road Structure, to a manhole at Station 192BL+33,

47’RT where it turns and runs southerly into the Milwaukee County Zoo. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

Contact Brian Pawlak (414-286-5970 office) of the City of Milwaukee - Cable 7 days in advance to coordinate locations and construction activities.

Milwaukee, City of - Conduit has underground communication conduit within the project limits in the following locations:

- An underground communications line beginning beyond the southerly project limits and running northerly in the southbound lanes of S. 68th Street to beyond the northerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning beyond the southerly project limits running northerly along the west side of S. 76th Street to a manhole at Station 263EW+91, 186’RT where it turns and runs westerly in the westbound lanes of Kearney Street to a manhole at Station 755FB+19, 55’RT. From there it turns and runs northerly, crossing IH 94 at Station 255EW+31, to a manhole at Station 555CR+16, 4’LT where it turns and runs westerly along the north side of O’Connor Street to a manhole at Station 548CR+33, 20’LT. From there it continues westerly in the westbound lanes of O’Connor Street to a manhole at Station 741FA+04, 10’LT where it turns and runs northerly to a manhole at Station 740FA+51, 247’LT. From there it turns and runs westerly through the Milwaukee Firehouse to a manhole in 84th Street at Station 45F+51, 12’LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning at a manhole at Station 548CR+33, 20’LT running northerly along the west side of S. Honey Creek Drive to beyond the northerly project limits of O’Connor Street. This line will remain in place without adjustment.
- An underground communications line beginning at a manhole at Station 741FA+03, 8’LT running westerly to a manhole at Station 42F+29, 11’LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning beyond the northerly project limits running southerly in the southbound lanes of S. 84th Street to a manhole at Station 36F+82, 20’LT where it turns and runs westerly in the westbound lanes of Adler Street to an manhole at Station 995AD+68, 28’LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning from beyond the northerly project limits and running southerly in the northbound lanes of S. 92nd Street, crossing IH 94 on the S. 92nd Street Structure, to a manhole at Station 995AD+68, 28’LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground communications line beginning beyond the easterly project limits of Bluemound Road running westerly in the median of Bluemound Road to a manhole at Station 203BL+48, 7’LT where it turns and runs southerly to Station 203BL+32, 36’RT. From there it turns and runs westerly in the eastbound lanes of Bluemound Road, crossing USH 45 on the Bluemound Road Structure, to a manhole at Station 192BL+33, 47’RT where it turns and runs southerly into the Milwaukee County Zoo. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

City of Milwaukee - Conduit also has abandoned facilities within the project limits in the following locations:

- An underground communications line beginning at a manhole at Station 564CR+61, 06’LT running westerly along the north side of O’Connor Street to a manhole at Station 555CR+16, 4’LT.
- An underground communications line beginning at a manhole at Station 548CR+33, 20’LT and running westerly along the north side of O’Connor Street to a manhole at Station 741FA+04, 9’LT.

Contact Karen Rogney (414-286-3243) of the City of Milwaukee – Conduit 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Lighting has overhead and underground street lighting facilities along Adler Street, Kearney Street, Chester Street, O'Connor Street, S. 70th Street, S. 73rd Street Pedestrian Bridge, S. 76th Street, S. 84th Street, S. 92nd Street, S. 95th Street, Bluemound Road, and Wisconsin Avenue. The City of Milwaukee will install interim overhead lighting facilities and remove permanent lighting required for construction. City forces will install permanent lighting facilities during construction and will need a minimum of 15 working days to install the permanent overhead.

Contact Dennis Miller (414-286-5942 office/ 414-708-4251 cell) or George Berdine (414-708-4245) or Thomas Hughs (414-286-3457 office/ 414-708-3175 cell) of the City of Milwaukee - Lighting 10 days in advance to coordinate installation of the interim lighting as well as the removal, reconstruction, and reconnection of the street lighting system.

Milwaukee, City of - Sanitary has sanitary sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 984AD+32, 12'RT running easterly down the middle of Adler Street to a manhole at Station 989AD+82, 4'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 990AD+75, 26'RT running easterly along the south side of Adler Street to a manhole at Station 995AD+52, 23'RT where it turns and runs northeasterly to a manhole at Station 995AD+77, 3'LT. From there it turns and runs easterly in the middle of Adler Street to a MMSD manhole in S. 84th Street at Station 37F+08, 13'RT. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning in Adler Street running southerly to beyond the southerly project limits in the following streets: S. 94th Place, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street. These lines will remain in place without adjustment.
- An underground sanitary sewer beginning at a manhole at Station 137KE+42, 4'RT running easterly along the south side of Kearney Street to beyond the eastern project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 45CH+21, 17'RT running easterly in the middle of Chester Street to a manhole at Station 49CH+51, 2'RT where it turns and runs northerly to beyond the northern project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 67TJ+47, 23'RT running northerly in the middle of the northbound lanes of S. 92nd Street to beyond the northern project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 52CH+93, 4'RT running easterly along the north side of Chester Street to a manhole at Station 59CH+49, 32'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 1005AD+12, 3'LT running northerly to a manhole at Station 1005AD+14, 25'LT and continues northerly, crossing IH 94 at Station 220EW+13, to a manhole at Station 59CH+49, 32'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at an existing MMSD Interceptor Sewer at Station 737FA+74, 45'LT running easterly in the middle of O'Connor Street to a manhole at Station 561CH+32, 8'LT where it turns and runs northerly to beyond the northerly project limits of O'Connor Street. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning from beyond the southern project limits running northerly in the middle of S. 84th Street to a manhole at Station 36F+86, 2'RT where it turns

and runs northwesterly to a manhole at Station 36F+93, 12'. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.

- An underground sanitary sewer beginning from beyond the easterly project limits of S. 84th Street running southwesterly to a manhole at Station 47F+12, 67'RT where it turns northwesterly to manhole at Station 47F+81, 1'LT. From there it turns and runs easterly to a MMSD manhole at Station 47F+81, 12'RT. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning in the Milwaukee County Zoo from beyond the westerly project limits running easterly, crossing USH 45 at Station 315NS+81, to a manhole at Station 315NS+96, 146'RT and continues to beyond the easterly project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 41TRN+94, 26'RT running northerly to a manhole at Station 47TRN+96, 32'RT. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 330NS+10, 432'RT and running westerly, crossing USH 45 at Station 329NS+75, to a manhole at Station 329NS+65, 94'LT. From there it turns northerly to a manhole at Station 333NS+99, 133'LT where it turns and runs westerly to a manhole at Station 333NS+82, 315'LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 195BL+67, 45'RT running westerly along the south side of Wisconsin Avenue to beyond the westerly project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 203BL+43, 53'RT running easterly along the south side of Wisconsin Avenue to beyond the easterly project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 203BL+35, 55'LT running easterly along the north side of Wisconsin Avenue to beyond the easterly project limits. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.
- An underground sanitary sewer beginning in the median of S. 84th Street at a MMSD manhole at Station 44F+96, 12'RT running westerly to a manhole at Station 44F+95, 61'LT and continues westerly to a manhole at Station 44F+98, 100'LT. From there it turns into a private sanitary sewer continuing westerly to beyond the westerly project limits of S. 84th Street. This line will remain in place without adjustment. Adjust the manholes as shown in the plans.

City of Milwaukee - Sanitary also has abandoned facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at Station 231EW+26, 133'RT running easterly to Station 239EW+00, 67'LT.
- An underground sanitary sewer beginning at Station 234EW+52, 42'RT running easterly to Station 235EW+16, 291'RT.
- An underground sanitary sewer beginning at a manhole at Station 36F+85, 2'RT running northerly in the median of S. 84th Street to a manhole at Station 39F+42, 2'RT.
- An underground private sanitary sewer beginning at Station 735FD+52, 130'LT running southwesterly to a manhole at Station 734FD+42, 39'LT. From there it turns westerly to a manhole at Station 728FD+51, 19'RT where it turn and runs northerly to beyond the northerly project limits of IH 94.
- An underground private sanitary sewer beginning at Station 729FD+70, 18'RT running northerly to beyond the northerly project limits of IH 94.

Contact Jason Barman (414-286-3267 office) of the City of Milwaukee - Sanitary 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Signals has existing signal facilities at the IH 94 on/off ramps of 68th Street, at the IH 94 on/off ramps of 70th Street, at the IH 94 on/off ramps of 76th Street, at Wisconsin Avenue/

S. 95th Street intersection, and at Wisconsin Avenue/ S. 97th Street intersection. Abandon, remove, leave in place, and reconstruct these facilities at the IH 94 on/off ramps of 70th Street as shown in the plans.

Contact Al Nichols, Traffic Operations Supervisor (414-286-3686 office/ 414-708-5148 cell) of City of Milwaukee - Signals or Mr. Joseph Blakeman, Traffic Control Engineer (414-286-8070) of City of Milwaukee - Signals 10 working days prior to signal changes between staging sequencing at Wisconsin Avenue/ S. 95th Street intersection and at Wisconsin Avenue/ S. 97th Street intersection. Allow City of Milwaukee forces 5 working days to complete signal modifications.

Contact Al Nichols (414-286-5941 office/ 414-708-5148 cell) of the City of Milwaukee - Signals 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee, City of - Water has underground water facilities within the project limits in the following locations:

- An underground water main beginning from beyond the westerly project limits running easterly along the south side of Bluemound Road to Station 195BL+45, 58'RT where it turns and runs southeasterly to Station 195BL+65, 78' RT. From there it turns and runs easterly, crossing USH 45 at Station 322NS+90, to Station 198BL+00, 80'RT where it turns and runs northeasterly to Station 198BL+14, 60'RT. From there it turns and runs easterly along the south side of Bluemound Road to beyond the easterly project limits of Bluemound Road. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning at Station 202BL+78, 55'RT running southerly in the southbound lanes of S. 95th Street to beyond the southerly project limits of S. 95th Street. This line will remain in place without adjustment.
- An underground water main beginning from beyond the easterly project limits of Bluemound Road running westerly along the north right of way of Bluemound Road to Station 202BL+60, 62'LT where it turns and runs northerly along the east right of way of S. 95th Street to Station 32WX+50, 16'RT. From there it turns and runs easterly in the eastbound lanes of Wisconsin Avenue to beyond the easterly project limits of Wisconsin Avenue. This line will remain in place without adjustment.
- An underground water main beginning from beyond the easterly project limits of USH 45 running westerly, crossing USH 45 at Station 314NS+27, to Station 314NS+08, 136'LT where it turns and runs southwesterly along the west right of way of USH 45 to Station 492NW+43, 45'RT. From there it turns and runs westerly to beyond the westerly project limits of USH 45 into the Milwaukee County Zoo. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning from beyond the southerly project limits of Adler Street running northerly to Station 983AD+79, 12'RT where it turns and runs easterly in the eastbound lanes of Adler Street to Station 987AD+27, 5'RT. From there it turns and runs northwesterly to Station 987AD+55, 19'LT where it turns and runs easterly in the westbound lanes of Adler Street to a water main in S. 84th Street at Station 36F+71, 18'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning in Adler Street running southerly beyond the southerly project limits in the following streets: S. 94th Place, S. 94th Street, S. 93rd Street, S. 92nd Street, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street. Abandon, remove, leave in place, and reconstruct the lines in S. 87th Place, S. 87th Street, and S. 86th Street as shown in the plans. The remaining lines will remain in place without adjustment.
- An underground water main beginning from beyond the northerly project limits of Chester Street running southerly in the median of Chester Street to Station 43CH+56, 6'RT where it turns and runs easterly in the westbound lanes of Chester Street to Station 59CH+51, 42'RT. From there it turns and runs northerly to beyond the northern project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

- An underground water main beginning at Station 49CH+60, 7'LT running northerly along the west side of S. 92nd Street to beyond the northerly project limits of S. 92nd Street. This line will remain in place without adjustment.
- An underground water main beginning from beyond the northerly project limits running southerly down the northbound lanes of S. 92nd Street to Station 66TJ+83, 16'RT where it turns and runs southeasterly to Station 66TJ+40, 52'RT. From there it turns and runs southerly, crossing IH 94 at Station 211EW+03, to where it tees into a water main in Adler Street at Station 63TJ+55, 52'RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning at Station 1009AD+88, 12'LT running northerly, crossing IH 94 at Station 224EW+87, to beyond the northerly project limits of IH 94. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning from beyond the southerly project limits running northerly in the southbound lanes of S. 84th Street to Station 36F+71, 17'LT. This line will remain in place without adjustment.
- An underground water main beginning from beyond the southerly project limits running northerly in the northbound lanes of S. 84th Street to beyond the northerly project limits. This line will remain in place without adjustment.
- An underground water main beginning in S. 84th Street at Station 43F+17, 41'RT running easterly in the westbound lanes of O'Connor Street to beyond the eastern project limits of O'Connor Street. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground water main beginning in O'Connor Street running northerly beyond the northerly project limits in the following streets: S.83rd Street, S. 82nd Street, Honey Creek Drive, S. 80th Street, and S. 79th Street. These lines will remain in place without adjustment.
- An underground water main beginning at Station 46F+40, 43'RT running northeasterly along the south side of Honey Creek Parkway to beyond the westerly project limits of S. 84th Street.
- An underground water main running north-south, crossing IH 94 at Station 262EW+18. This line will remain in place without adjustment.
- An underground water main beginning from beyond the southerly project limits running northerly in S. 68th Street to beyond the northerly project limits. This line will remain in place without adjustment.

Additionally, The City of Milwaukee owns and operates a Water Booster Station near Station 1011AD+00, 28'LT. Salvage and abandon the existing Water Booster Station according to the plan. Install a new Water Booster Station near Station 1019AD+50, 34'LT as shown in the plans.

City of Milwaukee water also has abandoned facilities within the project limits in the following locations:

- An underground water main beginning at Station 43CH+55, 5'LT running southerly to Station 43CH+84, 39'LT where it turns and runs westerly in Chester Street to Station 45CH+30, 5'RT.
- An underground water main beginning at Station 36F+81, 17'LT running northerly in the southbound lanes of S. 84th Street to Station 39F+77, 15'LT where it turns and runs easterly to Station 39F+77, 18'RT.
- An underground water main beginning at Station 38F+50, 18'RT running northerly in the northbound lanes of S. 84th Street to Station 39F+99, 18'RT.
- An underground water main beginning at Station 231EW+02, 131'RT running easterly to Station 238EW+79, 70'LT.
- An underground water main beginning at Station 234EW+57, 32'RT running southerly to Station 235EW+27, 303'RT.
- An underground water main running north-south throughout the project limits, crossing IH 94 at Station 264EW+31.

Contact Dave Goldapp (414-286-6301) of City of Milwaukee - Water 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee County – Electric & Communications has an underground electric line and a communication line beginning at an existing vault at Station 172EW+16, 307'RT running northwesterly together to a vault at Station 171EW+08, 212'RT where it turns and runs northerly in the center of the existing Zoo Maintenance Tunnel to a vault at Station 171EW+48, 146'LT and continues northerly to beyond the northerly project limits. These lines will remain in place without adjustment.

Milwaukee County Electric and Communications also has abandoned facilities within the project limits in the following locations:

- An underground electric and communications line beginning at a vault at Station 172EW+16, 307'RT running northwesterly to the Zoo Maintenance Tunnel at Station 171EW+35, 177'RT. The line then continues on the north side of the Zoo Maintenance Tunnel at Station 171EW+54, 105'LT where it turns and runs northwesterly to a vault at Station 171EW+48, 146'LT.
- An underground communications line beginning from beyond the easterly project limits of USH 45 running westerly, crossing USH 45 at Station 345NS+50, to Station 345NS+47, 69'LT where it turns and runs northerly along the west fence of USH 45 to beyond the northerly project limits.

Contact Karl Hackbarth (414-256-5413 office) of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee County - Sanitary has no utility facilities within the project limits.

Milwaukee County – Storm has existing underground storm sewer facilities within the project limits in the following locations;

- An underground storm sewer beginning at an inlet at Station 571SW+42, 23'LT running easterly, crossing the Zoo Maintenance Path to a inlet at Station 571SW+55, 27'LT where it turns and runs northerly to an inlet at Station 571SW+83, 44'LT and continues northerly into the Milwaukee County Zoo, beyond the northerly project limits of IH 94. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground storm sewer beginning at an inlet at Station 43XJ+88, 240'LT running southwesterly through the Milwaukee County Zoo parking lot to an inlet at Station 42XJ+83, 434'LT where it turns and runs southerly to an inlet at Station 495NW+37, 58'LT. From there it turns and runs southwesterly into the Milwaukee County Zoo, beyond the westerly project limits of the NW ramp. This line will remain in place without adjustment.
- An underground storm sewer beginning at an inlet at Station 195BL+08, 90'RT and running northerly to a manhole at Station 195BL+11, 73'RT where it turns and runs westerly along the south side of Bluemound Road to a manhole at Station 192BL+33, 47'RT. From there it turns and runs northerly and connects into a City of Wauwatosa storm sewer. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.

Contact Karl Hackbarth (414-256-5413 office) of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

Milwaukee County – Water has an underground water main beginning at the Milwaukee County Zoo running southerly, east of the Zoo Maintance Tunnel and crossing IH 94 at Station 172EW+71, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.

Milwaukee County Water also has an abandoned water main beginning from beyond the easterly project limits of USH 45running westerly, crossing USH 45 at Station 345NS+47, to beyond the westerly project limits of USH 45.

Contact Karl Hackbarth (414-256-5413 office) of Milwaukee County 7 days in advance to coordinate locations and any excavation near their facilities.

MMSD has existing underground sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning from beyond the southerly project limits of IH 94 running northerly along the east side of Underwood Parkway South, crossing under IH 94 at Station 101EW+73, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground sanitary sewer beginning from beyond the southerly project limits of S. 116th Street running northerly in the median of S. 116th Street, crossing IH 94 at Station 127EW+20, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground sanitary sewer beginning from beyond the northerly project limits of IH 94 running southerly along the east side of HWY 100 to a manhole at Station 575SS+69, 65'RT where it turns and runs southeasterly to a manhole at Station 574SS+93, 123'RT. From there it turns and runs southerly, crossing IH 94 at Station 156EW+72, to a manhole at Station 566SS+67, 133'RT where it turns and runs westerly to a manhole at Station 566SS+56, 70'RT. From there it turns and runs southerly along the east side of HWY 100 to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.
- A 39" MIS sanitary sewer beginning from beyond the westerly project limits of HWY 100 running easterly, crossing HWY 100 at Station 564+30, and continues easterly, crossing IH 94 at Station 168EW+88, to a manhole at Station 480NW+25, 41'RT. From there it turns and runs northeasterly to a manhole at Station 483NW+44, 36'RT where it turns and runs northerly through the Milwaukee County Zoo parking lot to a manhole in Bluemound Road at Station 186BL+91, 20'LT. From there it turns and runs easterly to a manhole at Station 188BL+62, 20'LT where it turns and runs northerly in the northbound lane of N. 99th Street to a manhole in Wisconsin Avenue at Station 18WX+78, 11'LT. From there it turns and runs easterly in the westbound lanes of Wisconsin Avenue, crossing USH 45 at Station 334NS+43, to beyond the easterly project limits of Wisconsin Avenue. This line will remain in place without adjustment.
- An underground sanitary sewer beginning at a manhole at Station 165EW+33, 157'RT running southerly, crossing the Hank Aaron State Trail at Station 156HA+08, to S. 105th Street. This line will remain in place without adjustment.
- A 96" MIS sanitary sewer beginning from beyond the southerly project limits of S. 84th Street running northerly along the southbound lanes of S. 84th Street to beyond the northerly project limits of S. 84th Street. This line will remain in place without adjustment.
- An underground sanitary sewer beginning from beyond the southerly project limits of S. 84th Street running northerly in the southbound lanes of S. 84th Street to a manhole at Station 35F+52, 27'LT where it turns and runs northeasterly to a manhole at Station 36F+84, 12'RT. From there it turns and runs northerly in the median of S. 84th Street to a manhole at Station 37F+08, 13'RT and continues northerly to a manhole at Station 37F+33, 14'RT where it turns westerly and connects into the 96" MIS sewer at Station 37F+36, 33'LT. This line is abandoned from Station 37F+33, 12' RT to Station 41F+56, 12' RT. There is an existing diversion chamber at Station 37F+33. 12' RT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning from beyond the easterly project limits of S. 84th Street running westerly to a manhole at Station 37F+06, 47'RT and continues to a manhole at Station 37F+08, 13'RT. This line will remain in place without adjustment.
- An existing flow meter at Station 37F+47, 3'RT. MMSD will salvage this facility during construction. Contact Debra Jensen (414-225-2143) of MMSD to coordinate removal.

MMSD also has additional abandoned sanitary sewer and storm sewer within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 480NW+25, 41'RT running easterly to an abandoned manhole at Station 482NW+87, 144'RT where it turns and runs to a manhole at Station 483NW+43, 36'RT.
- An underground sanitary sewer beginning at a manhole at Station 575SS+70, 66'RT running southerly along the east side of HWY 100, crossing IH 94 at Station 156EW+64, to a manhole at Station 566SS+56, 70'RT.
- An underground sanitary sewer beginning in the median of S. 84th Street at a manhole at Station 36F+84, 11'RT running easterly to a manhole at Station 36F+86, 32'RT where it turns and runs northeasterly to a manhole at Station 37F+06, 47'RT.
- An underground sanitary sewer beginning in the northbound lanes of S. 84th Street at a manhole at Station 36F+86, 32'RT running northerly to a manhole at Station 37F+24, 37'RT.
- An underground storm sewer overflow beginning in the median of S. 84th Street at a manhole at Station 37F+08, 12'RT running northeasterly to a manhole at Station 37F+24, 37'RT where it turns and runs northerly to Station 39F+29, 37'RT. From there it turns and runs northwesterly to an existing storm sewer at Station 40F+07, 8'LT.
- An underground sanitary sewer beginning in the median of S. 84th Street at a manhole at Station 37F+33, 14'RT running northerly in the northbound lanes of S. 84th Street to a manhole at Station 43F+35, 14'RT.

The MMSD will adjust manholes throughout the project limits during construction. Contact Debra Jensen (414-225-2143) of MMSD 5 days prior to any paving operations to coordinate manhole adjustments.

Contact Debra Jensen (414-225-2143) of MMSD 7 days in advance to coordinate locations and any excavation near their facilities.

Sprint has an underground communications line beginning from beyond the northerly project limits of IH 94 running southerly approximately 5' west of the east right of way of the Union Pacific Railroad, crossing IH 94 at Station 161EW+17, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.

Sprint also has an abandoned communications line beginning beyond the northerly project limits of IH 94 running southerly approximately 20' east of the west right of way of the Union Pacific Railroad, crossing IH 94 at Station 159EW+09, to beyond the southerly project limits of IH 94.

Contact James Burton (708-955-6659) of Sprint 7 days in advance to coordinate locations and any excavation near their facilities.

TCA has underground and overhead communication facilities within the project limits in the following location:

- An overhead communications line beginning beyond the northerly project limits running southeasterly on We Energies poles, crossing IH 94 at Station 123EW+57, to a pole at Station 124EW+14, 185'RT where it turns and runs easterly to a pole at Station 130EW+51, 192'RT. From there it drops to an underground facility and runs northerly to the previously described AT&T Corporation line at Station 130EW+79, 126'LT where it turns and runs joint with AT&T Corporation in the Hank Aaron State Trail to Station 153HA+44, 25'LT. From there it turns and runs south to a We Energies pole at Station 153HA+44, 53'RT beyond the southerly project limits. This line will remain in place without adjustment.
- An underground communications line beginning from beyond the westerly project limits of Schlinger Avenue running easterly along the north side of Schlinger Avenue to a We Energies pole at Station 531SCH+79, 33'LT where it turns and runs overhead along the east right of way of IH 894/ USH 45 to a pole at Station 182HA+95, 93'RT. From there it turns

and runs easterly to beyond the easterly project limits of USH 45. TCA will adjust this line near Station 529SCH+75, 25'LT prior to construction. The remaining portion of this line will remain in place without adjustment.

- An overhead communications line beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 276EW+95, to beyond the northerly project limits. TCA will raise this line over IH 94 prior to construction.

TCA also has an abandoned underground communications line beginning at a handhole at Station 530SCH+33, 25'LT and running northeasterly to Station 784GE+67, 197'RT.

Contact Debbie Sadler (414-459-3572 office/ 414-651-0036 cell) of Northwind Technical Services 7 days in advance to coordinate locations and any excavation near their facilities.

Time Warner Cable has existing overhead and underground communications facilities within the project limits in the following locations:

- An overhead communications line beginning from beyond the southerly project limits of USH 45 running northerly on We Energies poles along the west side of IH 894 / USH 45 to a pole at Station 228NS+64, 198'LT. Time Warner Cable will relocate this line to new We Energies poles prior to construction.
- An overhead communications line beginning from beyond the southerly project limits of S. 100th Street running northerly on We Energies poles along the east side of S. 100th Street to a pole at Station 43TD+92, 25'RT. Time Warner Cable will relocate this line outside the project limits prior to construction.
- An overhead communications line beginning from beyond the southerly project limits of USH 45 running northerly on We Energies poles along the east right of way of IH 894/ USH 45 to a pole at Station 775GE+80, 50'RT where it turns and runs northeasterly, crossing Schlinger Avenue at Station 531SCH+73, to a pole at 780GE+92, 60'RT. From there it turns and runs easterly along the north side of Schlinger Avenue to beyond the easterly project limits of Schlinger Avenue. This line will remain in place without adjustment.
- An overhead communications line beginning from beyond the easterly project limits of USH 45 running westerly to a We Energies pole at Station 808BB+42, 132'RT where it turns and runs northerly along the east right of way of USH 45 to a pole at Station 822BB+98, 31'LT. From there it turns and runs easterly to a pole at Station 199BL88+63'RT where it turns and runs westerly, crossing USH 45 at Station 322NS+21, to a pole at Station 194BL+59, 50'RT. From there it turns into an underground line and runs northerly to a manhole at Station 194BL+66, 7'RT. Time Warner Cable will abandon the underground portions in place and relocate the overhead portions throughout the project limits prior to construction.
- An underground communications line beginning at a manhole at Station 194BL+66, 7'RT running westerly in the median of Bluemound Road to beyond the westerly project limits of Bluemound Road. Time Warner Cable will abandon this line in place from the manhole at Station 194BL+66, 7'RT to Station 189+26, 16'RT prior to construction.
- An overhead communications line on We Energies poles beginning from beyond the westerly project limits of S. 97th Street running easterly to a pole at Station 39TF+69, 108'LT where it turns into an underground line and continues easterly to Station 38TF+86, 30'LT. From there it turns and runs southerly, crossing Bluemound Road, to a manhole at Station 194BL+66, 7'RT. Time Warner Cable will abandon the underground portions of this line in place prior to construction.
- An underground communications line beginning at Station 194BL+87, 55'LT running westerly along the north side of Bluemound Road to beyond the westerly project limits. Time Warner Cable will abandon this line in place throughout the project limits prior to construction.
- An underground communications line beginning from beyond the northerly project limits of Kearney Street running southerly to Station 816+82, 65' LT where it turns and runs to a manhole at Station 820+83, 10'RT. From there it turns and runs northerly to beyond the

northerly project limits of Kearney Street. Time Warner Cable will abandon this line in the project limits in place prior to construction.

- An overhead communications line on We Energies poles beginning from beyond the westerly project limits of Adler Street running easterly, crossing Adler Street at Station 1020AD+48 to a pole at Station 1021AD+18, 115'RT. This line will remain in place without adjustment.
- An overhead communications line on We Energies poles beginning from beyond the southerly project limits of S. 84th Street running northerly along the east side of S. 84th Street, crossing IH 94 at Station 283EW+11, to beyond the northern project limits of S. 84th Street. Time Warner Cable will relocate this line from Station 37F+03, 55'RT to Station 44F+61, 46'RT prior to construction.
- An overhead communications line on We Energies poles beginning from beyond the southerly project limits of Kearney Street in an ally between S. 76th Street and S. 75th Street running northerly to a pole at Station 266EW+16, 227'RT where it turns and runs easterly along the south side of Kearney Street to a pole at Station 273EW+03, 180'RT. From there it turns into an underground communications line and runs northerly, crossing Kearney Street, to Station 273EW+28, 133'RT where it turns easterly to a pole at 276EW+54, 119'RT. From there it rises up a We Energies pole and runs northerly, crossing IH 94 at Station 276EW+95, to beyond the northerly project limits of O'Connor Street. Time Warner Cable will abandon in place the underground portions of this line and raise the overhead crossing over IH 94 prior to construction.
- An underground communications line beginning from beyond the southerly project limits of Burleigh Street running northerly, crossing Burleigh Street in the area of the temporary Wauwatosa Water Booster Station to beyond the northerly project limits of Burleigh Street. This line will remain in place without adjustment.

Time Warner Cable will relocate, construct and reconstruct communication facilities in the project area at the following locations prior to construction:

- A new underground line beginning at a pole at Station 39TF+69, 108'LT running easterly to a manhole at Station 39TF+72, 37'LT where it continues easterly, crossing USH 45 at Station 324NS+38, to a manhole at Station 201BL+19, 79'LT. From there it turns and runs southerly, crossing Bluemound Road at Station 201BL+19, to Station 201BL+18, 79'RT where it turns and runs westerly to Station 199BL+79, 83'RT. From there it turns and runs southerly to beyond the southerly project limits of Bluemound Road.
- A new underground line beginning at Station 816+82, 65' LT running easterly under the Honey Creek Office Park Driveway to the Honey Creek Building where it enters the building.

Time Warner Cable also has abandoned facilities within the project limits in the following locations:

- Two underground communications lines beginning at a pole at Station 526SCH+17, 47'RT running easterly along the south side of Schlinger Avenue to Station 531SCH+10, 60'RT.
- An underground communication line beginning at a pole at Station 36F+85, 51'RT running northerly along the east side of S. 84th Street where it turns and runs easterly along the south side of Kearney Street to Station 741FB+31, 77'RT.

Contact Steve Cramer (414-277-4045) of Time Warner Cable 7 days in advance to coordinate locations and any excavation near their facilities.

TW Telecom has an existing underground communications line beginning at a manhole at Station 194BL+65, 7'RT running southerly, crossing Bluemound Road, to a pole at Station 194BL+60, 51'RT where it turns into an overhead facility and runs westerly along the south side of Bluemound Road on We Energies poles to a pole at Station 192BL+62, 53'RT. From there it turns and runs southerly to a pole at Station 192BL+60, 75'RT where it turns into an underground line and runs southwesterly to beyond the southerly project limits of Bluemound Road into the Milwaukee County Zoo. TW Telecom will abandon the underground portion in place from Station 194BL+65, 7'RT to Station 194BL+60,

51’RT prior to construction. We Energies will remove the overhead portions of this line within the project limits prior to construction.

TW Telecom will construct a new underground communications line prior to construction beginning at a manhole at Station 189BL+31, 2’RT running southerly, crossing Bluemound Road, to Station 189BL+31, 59’RT where it turns and runs easterly along the south side of Bluemound Road to Station 192BL+54, 59’RT. From there it turns and runs southerly to a handhole at Station 192BL+55, 80’RT.

Contact Brahim Gaddour (414-908-1027) of TW Telecom 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa, City of - Lighting has existing lighting facilities within the project limits in the following locations:

- Lighting facilities beginning from beyond the westerly project limits of Wisconsin Avenue running easterly along the south side of Wisconsin Avenue, crossing USH 45 on the Wisconsin Avenue Bridge, to a light at Station 31WX+72, 32’RT. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.
- Lighting facilities beginning at a light at Station 28WX+11, 32’RT running northerly, crossing Wisconsin Avenue at Station 28WX+09, to a light at Station 28WX+06, 53’LT where it turns and runs easterly along the north side of Wisconsin Avenue, crossing USH 45 on the Wisconsin Avenue Bridge, to a light at Station 32WX+14, 46’LT. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.
- Lighting facilities beginning at Station 25WX+77, 54’RT running southerly along the east side of S. 97th Street to a light at Station 41F+42, 16’RT. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact Bill Wehrley (414-479-8929) of City of Wauwatosa - Lighting 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa, City of – Sewer has existing underground sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 195+BL30, 51’LT running westerly along the north side of Bluemound Road to beyond the westerly project limits. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a manhole at Station 39TF+75, 25’LT running northerly in the median of S. 97th Street to a manhole at Station 25WX+37, 23’RT where it turns and runs westerly in the east bound lanes of Wisconsin Avenue to a manhole at Station 24WX+48, 23’RT. From there it turns and runs into a MMSD manhole at Station 24WX+49, 10’LT. Abandon, remove, leave in place, and reconstruct this line as shown in the plans.
- An underground sanitary sewer beginning at a MMSD manhole at Station 127EW+19, 187’RT running northwesterly to a manhole at Station 125EW+94, 151’RT and continues northwesterly, crossing IH 94 at Station 123EW+41, to Station 120EW+97, 174’LT. From there it turns and runs northerly to a manhole at Station 120EW+94, 197’LT where it turns and runs northwesterly in the center of Ripley Avenue to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

City of Wauwatosa - Sewer has an abandoned sanitary sewer beginning at a manhole at Station 127EW+02, 183’RT and running northwesterly, crossing IH 94 at Station 123EW+79, to a manhole at Station 120EW+94, 197’LT.

Contact Bill Wehrley (414-479-8929) of City of Wauwatosa - Sewer 7 days in advance to coordinate locations and any excavation near their facilities.

Wauwatosa Water Utility has existing underground water facilities within the project limits in the following locations:

- A 24" transmission water main beginning from beyond the easterly project limits of Wisconsin Avenue running westerly along the north side of Wisconsin Avenue to Station 33WX+44, 52'LT where it turns and runs northwesterly to Station 33WX+00, 76'LT. From there it turns and runs westerly, crossing USH 45 at Station 355NS+08, to Station 24WX+92, 76'LT where it turns and runs southwesterly to Station 24WX+49, 55'LT. From there it turns and runs westerly to beyond the westerly project limits of Wisconsin Avenue. Abandon, remove, leave in place, and reconstruct this line as shown in the plans. Additionally, a temporary Water Booster Station and associated water main at Burleigh Street is necessary to construct as part of this relocation. Construct the temporary Water Booster Station and associated water main as shown in the plans.
- An underground water main beginning from beyond the easterly project limits of Burleigh Street running westerly in the median of Burleigh Street to beyond the westerly project limits. Construct the temporary Water Booster Station and associated water main in this area as shown in the plans.
- An underground water main beginning from beyond the westerly project limits running easterly along the north side of W. Fairview Avenue, crossing Curtis Road, to Station 115EW+65, 136'LT where it turns and runs northerly along the east side of N. 120th Street to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

Contact Jim Wojcehowicz (414-479-8965) of the Wauwatosa Water Utility 7 days in advance to coordinate locations and any excavation near their facilities.

We Energies – Electric has overhead and underground electric facilities within the project limits in the following locations:

- An overhead electric line beginning from beyond the southerly project limits of IH 94 running northerly to Station 103EW+50, 151'RT where it turns northeasterly, crossing IH 94 at Station 103EW+96, to Station 104EW+42, 151'LT and continues northerly to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An overhead electric line beginning from beyond the westerly project limits of W. Fairview Avenue running easterly along the north side of W. Fairview Avenue, crossing N. 121st Street, to a pole at Station 113EW+94, 183'LT where it turns and runs northerly to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- Two overhead electric lines running parallel beginning from beyond the northerly project limits of IH 94 running southerly to Station 123EW+17, 149'LT where it turns and runs southeasterly, crossing IH 94 at Station 123EW+68, to Station 124EW+30, 166'RT. From there one line turns and runs easterly along the south side of W. Fairview Avenue, crossing W. Fairview Avenue at Station 24FV+98, to beyond the easterly project limits of Fairview Avenue. The other line continues southerly to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.
- An underground electric duct package beginning from beyond the northerly project limits of IH 94 running southerly along the east right of way of HWY 100, crossing IH 94 at Station 158EW+00, to beyond the southerly project limits of IH 94. This duct package will remain in place without adjustment.
- An underground electric duct package beginning from beyond the southerly project limits of IH 94 running northeasterly, crossing IH 94 at Station 171EW+13 in a We Energies utility tunnel, and continues northeasterly, crossing USH 45 at Station 301NS+66 in a We Energies utility tunnel, to the 96th Street Substation in the northeast quadrant of the Zoo Interchange, beyond the easterly project limits of USH 45. This line will remain in place without adjustment.

- An overhead electric line beginning from beyond the southerly project limits of S. 100th Street running northerly along the west fence of USH 45, crossing Schlinger Avenue at Station 526SCH+83, to a pole at Station 43+92, 25'RT. We Energies will abandon this line in the project limits during construction once all service disconnections have been terminated.
- An underground electric duct package beginning at the 96th Street Substation running southerly, crossing IH 94 at Station 200EW+94 in a We Energies utility tunnel, to Station 985AD+24, 7'LT where it turns and runs southwesterly along the southeast right of way of the Zoo Interchange, crossing Schlinger Avenue at Station 531SCH+58, where it turns and runs southerly along the east right of way of USH 45/IH 894 to beyond the southerly project limits. This line will remain in place without adjustment.
- An overhead electric line beginning from beyond the easterly project limits of USH 45 running westerly along the south side of the Hank Aaron State Trail to the east right of way of USH 45/IH 894 where it turns and runs southerly along the east right of way of USH 45/IH 894, crossing Schlinger Avenue at Station 531SCH+73, and continues to beyond the southerly project limits. This line will remain in place without adjustment.
- An underground electric line beginning at the We Energies utility tunnel at Station 985AD+24, 7'LT running easterly in Adler Street to a manhole in S. 84th Street at Station 36F+66, 30'RT. We Energies will abandon this line from Station 985AD+24, 7'LT to Station 1016AD+33, 3'RT and from Station 1022AD+40, 1'RT to the manhole at Station 36F+66, 30'RT prior to construction.
- An overhead electric line running east-west throughout the project limits, crossing S. 92nd Street at Station 61TJ+88. This line will remain in place without adjustment.
- An underground electric line beginning at a pole at Station 61TJ+88, 43'RT running westerly to a manhole at Station 61TJ+94, 11'LT where it turns and runs northerly, crossing IH 94 on the S. 92nd Street structure, to beyond the northerly project limits. We Energies will abandon this line from Station 63TJ+29, 9'LT to Station 67TJ+34, 11'LT prior to construction. The conduit attached to the structure is composed of transite material and it will be removed by We Energies in conjunction with the demolition of the structure. Allow We Energies 2 working days to perform removal of the transite conduits. Contact Amy Plato (414-385-6149 office / 414-335-7543 cell) of We Energies 21 days prior to the demolition of the structure to coordinate removal.
- An underground electric line beginning at a manhole at Station 67TJ+34, 11'LT running southerly in S. 92nd Street to Station 66TJ+79, 12'LT where it turns and runs easterly in Chester Street to a manhole at Station 52CH+06, 10'RT. From there it turns and runs northerly to a pole beyond the northerly project limits of Chester Street. We Energies will abandon this line in place prior to construction.
- An overhead pole line beginning from beyond the northerly project limits of Chester Street running southerly, crossing Chester Street at Station 48CH+20, to a pole at Station 48CH+20, 34'RT. We Energies will abandon this line within the project limits prior to construction.
- An underground electric line beginning at a manhole at Station 1019AD+46, 4'RT running northeasterly to the north side of Adler Street where it turns and runs southeasterly along the north side of Adler Street to a pole at Station 1020AD+63, 28'LT. This line will remain in place without adjustment.
- An underground electric duct package beginning from beyond the southerly project limits of S. 84th Street running northerly in the median of S. 84th Street, crossing under IH 94 at Station 237EW+85, to beyond the northerly project limits of S. 84th Street. Contact Amy Plato (414-385-6149 office / 414-335-7543 cell) of We Energies - Electric 10 working days prior to the removal of the box culvert. We Energies - Electric will take an outage on this line during the duration of the box culvert removal and installation of the proposed storm sewer and will reconnect this electric line after the excavation area is backfilled. Allow We Energies - Electric 30 working days to reestablish their conduit, pull new cable, and splice over electrical feeds before overhead operations begin related to B-40-863 or B-40-864. Contact Amy Plato (414-385-6149 office / 414-335-7543 cell) of We Energies - Electric 10 working days prior to the backfill of the excavation related to the box culvert removal and installation

of the proposed storm sewer. The remaining portions of this line will remain in place without adjustment.

- An overhead electric line beginning from beyond the southerly project limits of S. 84th Street running northerly along the east side of S. 84th Street, crossing IH 94 at Station 283EW+11, to beyond the northerly project limits of S. 84th Street. Once We Energies - Electric has reestablished their conduit in S. 84th Street, allow We Energies - Electric 15 working days prior to overhead operations related to B-40-863 or B-40-864 to remove portions of the overhead line from Station 36F+85, 51'RT to Station 44F+62, 46'RT. The remaining portions of this line will remain in place without adjustment.
- An underground electric line beginning at a manhole at Station 38F+36, 7'RT running westerly to a pole at Station 38F+58, 135'LT where it rises to an overhead line and continues westerly to beyond the westerly project limits of Adler Street. We Energies will adjust this line at Station 38F+56, 68'LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground electric line beginning at a pole at Station 261EW+99, 133'RT running westerly to Station 260EW+54, 111'LT. This line will remain in place without adjustment.
- An overhead electric line beginning beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 266EW+86, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An overhead electric line beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 276EW+95, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground electric line beginning from beyond the northerly project limits running southerly along the east side of S. 70th Street, crossing IH 94 at Station 286EW+42, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.
- An underground electric line beginning from beyond the northerly project limits running southerly along the east side of S. 70th Street, crossing IH 94 at Station 292EW+23, to beyond the southerly project limits of IH 94. This line will remain in place without adjustment.
- An underground electric line beginning from beyond the westerly project limits of USH 45 in the Milwaukee County Zoo running northeasterly to Station 491NW+08, 54'LT running northeasterly through the Milwaukee County Zoo along the west right of way of USH 45 to Station 496NW+62, 63'LT where it turns and runs northerly to Station 47XJ+53, 18'RT. From there it turns and runs northwesterly to beyond the westerly project limits of Bluemound Road. This line will remain in place without adjustment.
- An overhead electric line beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running northerly along the east fence of USH 45 to Station 198BL+41, 84'RT where it turns and runs easterly along the south side of Bluemound Road to Station 199BL+88, 63'RT. From there it turns and runs northeasterly, crossing Bluemound Road at Station 200BL+33, to Station 42TRN+19, 26'LT where it turns and runs easterly to beyond the easterly project limits. We Energies will abandon and remove this line from the 96th Street Substation to a pole at Station 42TRN+19, 26'LT prior to construction. We Energies will also reset a pole at Station 42TRN+19, 26'LT to Station 42TRN+21, 72'LT prior to construction.
- An overhead electric line beginning at a pole at Station 199BL+88, 63'RT running westerly along the south side of Bluemound Road, crossing USH 45 at Station 322NS+21, to a pole at Station 192BL+62, 52'RT where it turns and runs southerly to beyond the southerly project limits of Bluemound Road. We Energies will remove this line from Station 199BL+88, 63'RT to Station 192BL+62, 52'RT prior to construction.
- Two underground direct buried electric lines beginning at 96th Street Substation in the northeast quadrant of the Zoo Interchange running northerly along the east fence of USH 45 to Station 198BL+30, 80'RT where it turns and runs easterly to Station 201BL+98, 62'RT. From there it turns and runs northerly along the west side of S. 95th Street to Station 51TRN+42, 0'LT where it turns and runs easterly to the east right of way of USH 45. From there it turns and runs northerly along the east right of way of USH 45 to beyond the northerly project limits of USH 45. We Energies will abandon this line in place from the 96th

Street Substation to Station 51TRN+42, 0'LT prior to construction. The remaining portions of this line will remain in place without adjustment.

- An overhead electric line beginning from beyond the easterly project limits of S. 95th Street running westerly, crossing S. 95th Street at Station 48TRN+20 to a pole at Station 48TRN+20, 11'LT where it turns and runs northwesterly to a pole at Station 31WX+51, 43'RT. We Energies will abandon this line from Station 48TRN+16, 119'RT to Station 31WX+51, 43'RT prior to construction.
- An empty electric conduit on the Bluemound Road Structure in the westbound lanes crossing USH 45 at Station 323NS+21. The conduit attached to the structure is composed of transite material and it will be removed by We Energies in conjunction with the demolition of the structure. Allow We Energies 2 working days to perform removal of the transite conduits. Contact Amy Plato (414-385-6149 office / 414-335-7543 cell) of We Energies 21 days prior to the demolition of the structure to coordinate removal
- An empty electric conduit on the Wisconsin Avenue Structure in the westbound lanes crossing USH 45 at Station 734BA+69. The conduit attached to the structure is composed of transite material and it will be removed by We Energies in conjunction with the demolition of the structure. Allow We Energies 2 working days to perform removal of the transite conduits. Contact Amy Plato (414-385-6149 office / 414-335-7543 cell) of We Energies 21 days prior to the demolition of the structure to coordinate removal.
- An overhead electric line beginning from beyond the southerly project limits of USH 45 running northerly along the west side of IH 894 / USH 45 to beyond the northerly project limits of the Berm near the Union Pacific Rail Road. We Energies will relocate this line in the project area prior to construction.

We Energies - Electric will relocate, construct and reconstruct electric facilities in the project area at the following locations prior to construction:

- A new overhead pole line crossing the Hank Aaron State Trail at Station 173HA+00.
- A new underground electric conduit beginning at the We Energies Utility tunnel at Station 985AD+31, 5'LT running easterly in the eastbound lanes of Adler Street to Station 1016AD+32, 2'RT.
- A new overhead electric line beginning from beyond the southerly project limits of S. 91st Street running northerly to a pole at Station 998AD+25, 34'RT where it turns and runs northwesterly, crossing IH 94 at Station 212EW+94, to beyond the northerly project limits of Chester Street.
- A new underground electric conduit beginning at a manhole at Station 1022AD+35, 3'RT running easterly in Adler Street to a manhole at Station 36F+65, 28'RT.
- Two new direct buried electric lines running in tandem approximately 10' apart beginning at 96th Street Substation running northerly along the east side of Milwaukee Montessori School to 95th Street and continues northerly along the west side of 95th Street to Station 202BL+24, 76'RT. From there they turn and run westerly to Station 201BL+53, 64'RT where they turn and run northerly, crossing Bluemound Road at Station 201BL+50 and Station 201BL+58, and continue northerly along the west side of 95th Street to Station 51TRN+44, 68'LT. From there they turn and run easterly to Station 51TRN+42, 0'LT.
- A new underground electric line beginning at 96th Street Substation and running northerly along the east right of way of USH 45 in private easement to the south side of Bluemound Road where it turns and runs easterly along the south side of Bluemound Road to Station 201BL+32, 88'RT. From there it turns and runs northerly, crossing Bluemound Road at Station 201BL+32, to station 42TRN+21, 66'LT where it turns and runs easterly, crossing S. 95th Street to a new pole at Station 42TRN+21, 62'RT.
- An new overhead electric line beginning from beyond the southerly project limits of USH 45 running northerly along the west right of way of IH 894 / USH 45 to a pole at Station 228NS+23, 241'LT where it turns and runs easterly to a pole at Station 228NS+31, 194'LT.

We Energies - Electric also has abandoned electric lines within the project limits in the following locations:

- An underground electric line beginning beyond the southerly project limits of IH 94 running northeasterly, crossing the Hank Aaron State Trail at Station 131HA+56, to Station 142EW+42, 330'RT where it turns and runs southeasterly to Station 148EW+15, 357'RT. From there it turns and runs easterly to Station 154EW+07, 168'RT where it turns northeasterly to Station 154EW+34, 34'RT. From there it turns and runs easterly, crossing STH 100 at Station 569SN+93, to Station 156EW+16, 8'RT where it turns southeasterly to Station 159EW+96, 198'RT, crossing the Union Pacific Railroad, to Station 162EW+97, 173'RT. From there it turns and runs southeasterly to Station 164EW+47, 214'RT where it turns easterly to Station 169EW+89, 77'RT and then runs northeasterly, crossing IH 94 at Station 171EW+15, to beyond the northerly project limits of IH 94.
- An abandoned conduit beginning at the We Energies Adler Tunnel running westerly to Station 985AD+28, 6'LT where it turns and runs southwesterly, crossing under the Hank Aaron State Trail at Station 182+00 and Schlinger Avenue at Station 530SCH+14 and Greenfield Avenue at Station 519G+22 to beyond the southerly project limits.
- An underground electric line beginning from beyond the southerly project limits of IH 94 running northerly to Station 752FB+72, 28'RT where it turns and runs westerly to Station 747FB+82, 8'RT.
- An underground electric line beginning from beyond the westerly project limits of USH 45 in the Milwaukee County Zoo running northeasterly to Station 492NW+54, 67'LT where it turns and runs northerly to Station 315NS+50, 123'LT. From there it turns and runs westerly to Station 43XJ+35, 22'RT where it turns and runs northerly to Station 49XJ+41, 42'RT. From there it turns and runs westerly to beyond the westerly project limits of Bluemound Road.

Contact Amy Plato (414-335-5585 office / 414-335-7543 cell) of We Energies 7 days in advance to coordinate locations and any excavation near their facilities.

We Energies – Gas has underground gas facilities within the project limits in the following locations:

- An underground gas main beginning from beyond the westerly project limits of Schlinger Avenue running easterly on the south side of Schlinger Avenue to Station 526SCH+83, 31'RT where it turns and runs northerly to Station 526SCH+83, 10'RT. From there it turns and runs easterly in the eastbound lanes of Schlinger Avenue to beyond the easterly project limits of Schlinger Avenue. We Energies - Gas will abandon this line in place from Station 525SCH+75, 27'RT to Station 527SCH+17, 10'RT. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the westerly project limits of Bluemound Road running easterly in the median of Bluemound Road, crossing USH 45 at Station 322NS+73 on the Bluemound Road structure over USH 45, and continues easterly to beyond the easterly project limits of Bluemound Road. We Energies - Gas will abandon this main in place from Station 191+02, 8'RT to Station 206BL+54, 7'RT prior to construction. The main on the bridge will be purged and abandoned in place prior to construction. Contact Amy Plato (414-335-5585 office / 414-335-7543 cell) of We Energies - Gas 10 days prior to bridge demolition to confirm proper abandonment. Remove the pipe attached to the structure during demolition. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 191BL+88, 50'LT running easterly along the north side of Bluemound Road to Station 194BL+96, 54'LT where it turns and runs northerly along the west right of way of S. 97th Street to Station 25WX+05, 26'RT. From there it turns and runs westerly along the south side of Wisconsin to beyond the westerly project limits of Wisconsin Avenue. We Energies - Gas will abandon portions of this main in place from Station 191BL+88, 50'LT to Station 24WX+68, 28'RT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 191BL+88, 8'RT running northerly along the west side of S. 98th Street to Station 22WX+00, 30'RT. We Energies - Gas will abandon

portions of this main in place from Station 191BL+88, 8’RT to Station 191BL+97, 190’LT prior to construction. The remaining portions of this line will remain in place without adjustment.

- An underground gas main beginning from beyond the westerly project limits of Wisconsin Avenue running easterly in the westbound lanes of Wisconsin Avenue to Station 28WX+58, 21’LT, where it turns and runs northeasterly to Station 28WX+97, 60’LT. From there it turns and runs easterly to Station 31WX+43, 60’LT where it turns and runs southeasterly to Station 31WX+78, 18’LT. From there it turns and runs easterly to beyond the easterly project limits of Wisconsin Avenue. We Energies - Gas will abandon this main in place from Station 21WX+93, 20’LT to Station 35WX+12, 21’LT prior to construction. The main on the bridge will be purged and abandoned in place prior to construction. Contact Amy Plato (414-335-5585 office / 414-335-7543 cell) of We Energies - Gas 10 days prior to bridge demolition to confirm proper abandonment. Remove the pipe attached to the structure during demolition. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the westerly project limits of Wisconsin Avenue running easterly on the north side of Wisconsin Avenue to Station 25WX+75, 70’LT, where it turns and runs southeasterly to Station 26WX+02, 49’LT. From there it turns and runs easterly and ties into another gas main at Station 28WX+84, 47’LT. We Energies-Gas will abandon this main in place from Station 22WX+26, 55’LT to Station 28WX+84, 47’LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the easterly project limits of Wisconsin Avenue running westerly on the north side of Wisconsin Avenue to Station 32WX+05, 54’LT, where it turns and runs southwesterly and ties into another gas main at Station 31WX+76, 20’LT. We Energies - Gas will abandon this main in place from Station 35WX+16, 51’LT to Station 31WX+76, 20’LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 203BL+40, 10’RT running northerly, crossing Bluemound Road to Station 203+41, 54’RT where it turns and runs westerly to Station 203BL+03, 54’LT. From there it turns and runs northerly along the east side of S. 95th Street to Station 32WX+70, 34’LT where it turns and runs easterly in the westbound lanes of Wisconsin Avenue to Station 33WX+82, 34’LT. From there it turns and runs northeasterly to a gas regulation station at Station 34+23, 69’LT. We Energies - Gas will abandon portions of this line in place from Station 203BL+40, 10’RT to Station 42TRN+22, 55’RT and from Station 48TRN+12, 61’RT to the gas regulation station prior to construction. The remaining portions of this line and the gas regulation station will remain in place without adjustment.
- An underground gas main beginning at Station 203BL+03, 66’LT running easterly along the north side of Bluemound Road to Station 207BL+82, 63’LT. We Energies Gas will abandon this line in place prior to construction.
- An underground gas main beginning at Station 205BL+82, 9’RT running northerly along the west side of S. 94th Street to beyond the northerly project limits of S. 94th Street. We Energies - Gas will abandon portions of this line in place from Station 205BL+82, 9’RT to Station 206BL+08, 147’LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning from beyond the easterly project limits of Bluemound Road running westerly along the south side of Bluemound Road to Station 203BL+03, 63’ RT where it turns and runs southerly along the east side of S. 95th Street to beyond the southerly project limits. We Energies - Gas will abandon this line from Station 204BL+00 to Station 35TRS+88, 12’RT prior to construction.
- An underground gas main beginning at Station 32WX+72, 33’RT running easterly along the south side of Wisconsin Avenue to beyond the easterly project limits of Wisconsin Avenue. We Energies - Gas will abandon this line from Station 32WX+72, 33’RT to Station 34WX+06, 32’RT prior to construction. The remaining portions of this line will remain in place without adjustment.

- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 156EW+80, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground gas main beginning from beyond the southerly project limits running northerly in the southbound lanes of 92nd Street, crossing IH 94 at Station 21EW+42 on the S. 92nd Street Structure over IH 94, and continues northerly to beyond the northerly project limits of S. 92nd Street. We Energies - Gas will abandon this line in place from Station 61TJ+81, 19'LT to Station 67TJ+51, 25'LT prior to construction. The main on the bridge will be purged and abandoned in place prior to construction. Contact Amy Plato (414-335-5585 office / 414-335-7543 cell) of We Energies - Gas 10 days prior to bridge demolition to confirm proper abandonment. Remove the pipe attached to the structure during demolition. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 45CH+04, 18'RT running easterly in the eastbound lanes of Chester Street to Station 50CH+41, 17'RT, where it turns and runs northerly to Station 50CH+42, 16'LT. From there it turns and runs easterly along the north side of Chester Street to Station 59CH+04, 20'RT. We Energies - Gas will abandon this entire line in place prior to construction.
- An underground gas main beginning from beyond the southerly project limits of Adler Street running northerly to Station 983AD+67, 17'LT where it turns and runs easterly along the south side of Adler Street to a gas main in S. 84th Street at Station 36F+37, 32'LT. We Energies - Gas will abandon this line in place throughout the project limits.
- An underground gas main beginning in Adler Street running southerly beyond the southerly project limits in the following streets: S. 94th Place, S. 94th Street, S. 93rd Street, S. 92nd Street, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street. We Energies - Gas will abandon these lines in place in all streets prior to construction.
- An underground gas main beginning from beyond the southerly project limits of S. 84th Street running northerly in the southbound lanes of S. 84th Street to beyond the northerly project limits of S. 84th Street. Contact Paul Osmanski (414-315-1278) of We Energies - Gas 10 working days prior to the demolition of the box culvert. We Energies - Gas will abandon portions of this line in place from Station 36F+37, 33'LT to Station 45F+23, 57'LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 43F+41, 26'LT running easterly along the north side of O'Connor Street to 76th Street. We Energies - Gas will abandon this line in place from Station 43F+41, 26'LT to Station 544CR+85, 25'LT prior to construction. The remaining portions of this line will remain in place without adjustment.
- An underground gas main beginning at Station 741FA+29, 11'LT running northerly along the east side of S. 83rd Street to beyond the northerly project limits. We Energies - Gas will abandon this line in place from Station 741FA+29, 11'LT to beyond the northerly project limits of S. 83rd Street.
- Two underground gas mains running north-south throughout the project limits, crossing IH 94 at Station 260EW+90 and Station 260EW+98. These lines will remain in place without adjustment.
- An underground gas main beginning from beyond the westerly project limits of W. Dixon Street running easterly in W. Dixon Street and continues easterly along the north right of way of O'Connor Street to S. 68th Street. This line will remain in place without adjustment.
- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly in the southbound lanes of S. 68th Street, crossing under IH 94 at Station 292EW+28, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

We Energies - Gas will relocate, construct and reconstruct underground gas facilities in the project area at the following locations prior to construction:

- A new underground gas line beginning at Station 525SCH+75, 28’RT running northerly to Station 525SCH+75, 1’RT where it turns and runs easterly in the median of Schlinger Avenue to Station 527SCH+17, 1’RT. From there it turns and runs southerly to Station 527SCH+17, 10’RT.
- A new underground gas line beginning in Bluemound Road at Station 191BL+00, 8’RT running northerly to Station 191BL+02, 46’LT where it turns and runs easterly to Station 191BL+68, 46’LT. From there it turns and runs northerly along the west side of S. 98th Street to Station 191+78, 193’LT where it turns and runs easterly to S. 97th Street at Station 39F+71, 56’LT. From there it turns and runs northerly along the west side of 97th Street to Station 48TF+00, 7’LT where it turns and runs easterly, crossing USH 45 at Station 332NS+56, to Station 48TRN+25, 62’RT. From there it turns and runs northerly along the east right of way of S. 95th Street to Station 49TRN+61, 62’RT where it turns and runs easterly along the south side of Wisconsin Avenue to Station 34WX+06, 38’RT. From there it turns and runs northerly, crossing Wisconsin Avenue, to a gas regulation station.
- A new underground gas line beginning at Station 190BL+96, 8’RT running southerly to Station 190BL+92, 62’RT where it turns and runs easterly to Station 192BL+56, 68’RT. From there it turns and runs southerly to beyond the southerly project limits of Bluemound Road.
- A new underground gas line beginning at Station 204BL+00, 63’RT running westerly along the south side of Bluemound Road to Station 203BL+12, 64’RT where it turns and runs southerly along the east right of way of S. 95th Street to Station 35TRS+88, 12’RT.
- A new underground gas line beginning at Station 42TRN+22, 55’RT running southerly along the east right of way of S. 95th Street to Station 203BL+00, 66’LT where it turns and runs easterly along the north right of way of Bluemound Road to Station 207BL+82, 67’LT.
- A new underground gas line beginning at Station 205BL+85, 76’LT running northerly to Station 206BL+07, 147’LT.
- A new underground gas line beginning in Wisconsin Avenue at Station 21WX+92, 22’LT running northerly to Station 21WX+92, 41’LT where it turns and runs easterly to Station 22WX+45, 41’LT. From there it turns and runs southerly to Station 22WX+45, 5’RT where it turns and runs easterly in the eastbound lanes of Wisconsin to Station 25WX+20, 5’RT. From there it turns and runs southerly to Station 48TF+16, 10’LT where it turns and runs easterly, crossing USH 45 at Station 332NS+68, to an alley east of 95th Street to Station 35WX+90, 170’RT. From there it turns and runs northerly along the west side of S. 94th Street to Station 35WX+87, 35’RT where it turns and runs westerly to Station 34WX+73, 35’RT. From there it turns and runs northerly to Station 34WX+73, 64’LT where it turns and runs northwesterly to a gas regulation station at Station 34WX+23, 69’LT.
- A new underground gas line beginning from beyond the southerly project limits of Adler Street running northerly along the east side of Alder Street to Station 983AD+60, 21’RT where it turns and runs easterly along the south side of Adler Street to S. 84th Street at Station 36F+31, 44’LT.
- New underground gas line beginning in Adler Street running southerly beyond the southerly project limits in the following streets: S. 94th Place, S. 94th Street, S. 93rd Street, S. 92nd Street, S. 91st Place, S. 91st Street, S. 90th Street, S. 89th Street, S. 88th Street, S. 87th Place, S. 87th Street, and S. 86th Street.
- A new underground gas line beginning at Station 43CH+29, 19’LT running easterly along the north right of way of Chester Street to Station 47CH+83, 28’LT.
- A new underground gas line beginning at Station 68TJ+81, 48’RT running southerly along the east right of way of S. 92nd Street to Station 50CH+48, 16’LT where it turns and runs easterly along the north side of Chester Street to Station 53CH+51, 21’LT.
- A new underground gas line beginning at Station 45F+25, 57’LT running easterly, crossing S. 84th Street at Station 45F+25, to Station 45F+25, 52’RT where it turns and runs southerly to Station 44F+65, 52’RT. From there it turns and runs easterly S. 83rd Street at Station 741FA+03, 248’LT where it turns and runs southerly to O’Connor Street at Station 741FA+44, 30’LT. From there it turns and runs along the north side of O’Connor Street to Station 544CR+85, 48’LT where it turns and runs southerly and ties into a main at Station 544CR+85, 24’LT.

We Energies - Gas also has abandoned facilities within the project limits in the following locations:

- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 156EW+26, to beyond the northerly project limits of IH 94.
- An underground gas line beginning from beyond the southerly project limits of IH 94 running northerly to the Zoo Maintenance Tunnel at Station 171EW+46, 57'RT. The line continues on the north side of the Zoo Maintenance Tunnel at Station 171+74, 105'LT to beyond the northerly project limits.
- An underground gas main beginning from at Station 42TD+50 running northerly through the Zoo IC Core to approximately the SW Ramp.
- An underground gas main beginning from beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 264EW+39, to beyond the northerly project limits of IH 94.
- An underground gas main beginning beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 265EW+41, to beyond the northerly project limits of IH 94.

Additionally, We Energies will remove abandoned gas main in conflict with proposed construction in locations where the gas main coating may contain hazardous material. The removal of such abandoned gas main will occur during construction. Contact Paul Osmanski (414-944-5796) of We Energies 10 days prior to any activity that will expose the existing gas main to coordinate removal activities.

Contact Amy Plato (414-335-5585 office / 414-335-7543 cell) of We Energies 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Communications has an existing underground communications line beginning beyond the southerly project limits of S. 84th Street running northerly along the east side of S. 84th Street to WisDOT FTMS vault at Station 38F+19, 65'RT where it turns and runs westerly in a WisDOT FTMS conduit system. Abandon, remove, leave in place, and reconstruct the communication facilities as shown in the plans.

Contact Peter Daniels (414-302-8374 office) of City of West Allis - Communications 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Lighting has existing lighting facilities within the project limits in the following locations:

- Lighting facilities beginning from beyond the southerly project limits of S. 100th Street running northerly along the east side of S. 100th Street to a light pole at Station 778GD+10, 5'LT. Abandon, remove, leave in place, and reconstruct the lighting facilities as shown in the plans.
- Lighting facilities beginning from beyond the easterly project limits running westerly along both, the north and south side of Schlinger Avenue, to Station 526SCH+92 where they both cross Schlinger Avenue and connect into each other. Abandon, remove, leave in place, and reconstruct the lighting facilities as shown in the plans.
- Lighting facilities beginning from beyond the southerly project limits running northerly along the west side of S. Curtis Road, crossing under IH 94 at Station 111EW+81, to Station 111EW+86, 137'LT where it turns and runs easterly, crossing S. Curtis Road, to a pedestal at Station 113EW+22, 126'LT. These facilities will remain in place without adjustments.
- Lighting facilities beginning at a pedestal at Station 113EW+22, 126'LT and running southerly along the east side of S. Curtis Road, crossing under IH 94 at Station 112EW+66, to Station 113EW+00, 154'RT where it turns and runs easterly along the north side of W. Fairview Street to Station 127EW+31, 152'RT. From there it turns and runs southerly along

the east side of W. Fairview Street to beyond the southerly project limits. These facilities will remain in place without adjustments.

Contact Peter Daniels (414-302-8374 office) of City of West Allis - Lighting 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Sewer has existing sanitary sewer facilities within the project limits in the following locations:

- An underground sanitary sewer beginning at a manhole at Station 767GD+39, 58'LT running northerly along the west side of S. 100th Street to a manhole at Station 773GD+65, 57'LT where it turns and runs easterly to a manhole at Station 773GD+64, 9'LT. From there it turns and runs northerlq1y along the east side of S. 100th Street to a manhole at Station 779GD+99, 1'RT. The City of West Allis will abandon this line from the manhole at Station 773GD+65, 57'LT to the manhole at Station 779GD+99, 1'RT prior to construction.
- An underground sanitary sewer beginning at a City of Wauwatosa sanitary manhole at Station 125EW+93, 152'RT running westerly along the south side of W. Fairview Avenue to a manhole at Station 117EW+38, 172'RT. This line will remain in place without adjustment.

The City of West Allis - Sewer will construct a new underground sanitary sewer line beginning at a manhole at Station 773GD+65, 34'LT running northerly in the median of S. 100th Street to a manhole at Station 779GD+24, 24'LT. The City of West Allis will construct this line prior to construction:

Contact Joe Burtch (414-302-8379 office) of City of West Allis – Sewer 7 days in advance to coordinate locations and any excavation near their facilities.

West Allis, City of - Water has existing underground water facilities within the project limits in the following locations:

- An underground water main beginning from beyond the southerly project limits running northerly in the southbound lanes of S. 100th Street, crossing Schlinger Avenue at Station 526SCH+34, and continues northerly to Station 41TD+96, 18'LT. This line will remain in place without adjustment.
- An underground water main beginning from beyond the westerly project limits of S. 100th Street running easterly along the south side of Schlinger Avenue to beyond the easterly project limits. This line will remain in place without adjustment.
- An underground water main beginning from beyond the southerly project limits running northerly along the west side of S. 116th Street to Station 127EW+06, 166'RT where it turns and runs westerly along the south side of W. Fairview Avenue to Station 121EW+53, 132'RT. This line will remain in place without adjustments.
- An underground water main beginning from beyond the southerly project limits running northerly along the east side of Curtis Road to Station 112EW+68 136'LT where it turns and runs westerly along the south side of W. Fairview Avenue to beyond the westerly project limits. This line will remain in place without adjustment.
- An underground water main beginning at Station 112EW+88, 195'RT running easterly along the south side of W. Fairview Avenue to Station 117EW+67, 190'RT. This line will remain in place without adjustment.

Contact Joe Burtch (414-302-8379 office) of City of West Allis - Water 7 days in advance to coordinate locations and any excavation near their facilities.

West Shore Pipeline has an underground gas pipeline beginning from beyond the southerly project limits of IH 94 running northeasterly to Station 101EW+64, 318'RT where it turns and runs northwesterly along the east side of Underwood Parkway South, crossing IH 94 at Station 101EW+42, to beyond the northerly project limits of IH 94. This facility will remain in place without

adjustments. Contact Aric Aufdermauer (414-391-8102) of West Shore Pipeline 48 hours before any excavation or other construction activities within 25 feet of the described gas pipeline.

Contact Aric Aufdermauer (414-391-8102) of West Shore Pipeline 7 days in advance to coordinate locations and any excavation near their facilities.

Windstream has existing underground and overhead communications facilities within the project limits in the following locations:

- An overhead communications line on We Energies poles beginning beyond the southerly project limits of IH 94 running northerly, crossing IH 94 at Station 266EW+87, to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.
- An underground communications line in We Energies conduit beginning from beyond the southerly project limits running northerly along the east right of way of USH 45/ IH 894, crossing Schlinger Avenue at Station 531SCH+58 and the Hank Aaron State Trail at Station 181HA+66, and continues northerly around the east right of way of the SE Ramp to the We Energies Adler Tunnel along the north side of Adler Street. From there it goes into the Adler Tunnel, crossing IH 94 at Station 201EW+00, to Station 801FH+65, 77'LT and continues northerly to beyond the northerly project limits of IH 94. This line will remain in place without adjustment.

Windstream has an abandoned communication facility in an abandoned We Energies conduit at the We Energies Adler Tunnel running westerly to Station 985AD+28, 6'LT where it turns and runs southwesterly, crossing under the Hank Aaron State Trail at Station 182+00 and Schlinger Avenue at Station 530SCH+14 and Greenfield Avenue at Station 519G+22 to beyond the southerly project limits

Contact Jim Kostuch (262-792-7938 office) of WindStream 7 days in advance to coordinate locations and any excavation near their facilities.

WisDOT – Lighting has existing lighting facilities along IH 94, IH 894, USH 45 and along the interchange ramps throughout the project area. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact Eric Perea (262-574-5422 office/414-750-0935 cell) of WisDOT - Lighting 7 days in advance to coordinate locations and any excavation near their facilities.

WisDOT – Signals has existing signal facilities at the IH 94 on/off ramps at 84th Street, at the IH 94 on/off ramps at HWY 100, at Bluemound Road/ 95th Street intersection, and at Bluemound Road/ 97th Street intersection. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact WisDOT Traffic Signal Operations (414-750-2605) 7 days in advance to coordinate construction.

WisDOT STOC has existing communication facilities located throughout the project limits. Abandon, remove, leave in place, and reconstruct these facilities as shown in the plans.

Contact Jeff Madson (414-225-3723) of WisDOT - STOC 7 days in advance to coordinate locations and any excavation near their facilities.

54. Removing Old Culverts and Bridges.

Remove entire article language and replace with the following:

Supplement 203.3.1 of the standard specifications with the following:

(5) Structure Removal Site Safety Plan

Prepare a Structure Removal Site Safety Plan covering all structure removal work included in the contract. Maintain posted copies of the Structure Removal Site Safety Plan at the site in the project field office. Provide two copies of the Structure Removal Site Safety Plan to the engineer at least four weeks prior to beginning removal work.

(6) Structure Removal Plans

Prepare a structure specific removal plan for each of the following existing structures indicating the methods and sequence of demolition:

Existing Structure	Structure Type	Feature On	Feature Under
B-40-0092	4 Span Rolled Steel I-Beam	South 92nd Street	I-94
B-40-0093	Reinforced Box Culvert	I-94	Honey Creek
B-40-0129	4 Span Prestressed Girder	USH 18 EB / Bluemound Road	USH 45
B-40-0130	4 Span Prestressed Girder	USH 18 WB / Bluemound Road	USH 45
B-40-0131	4 Span Prestressed Girder	West Wisconsin Avenue	USH 45
B-40-0755	2 Span Curved Steel Plate I-Girder	SW Ramp	USH 45

The above table does not include all the structure removals included in the contract. The above table is a list of existing structure removals included in the contract for which a structure specific detailed removal plan is required to be submitted.

The contractor is strongly encouraged to examine existing structure plans and visit the site prior to preparing and submitting the structure removal plans. The contractor is responsible for the methods and sequence of demolition, including effects on the overall stability of each structure being removed. At a minimum, each removal plan shall include:

1. The name of the professional engineer, registered in the state of Wisconsin who will be on site and monitor the removal of existing structures as required in this specification.

2. The name of the contractor's on-site-employee designated in responsible charge of all removal operations.

3. The removal method and sequence of removal for each individual structure, including the staging of bridge removals.

4. Analysis of the stability of the structure based on the methods and sequence of demolition proposed, to ensure that the structure is demolished in a safe and controlled manner. The analysis computations shall be prepared, signed and sealed by a professional engineer registered in the State of Wisconsin.

5. Design and details of temporary supports, shoring or temporary bracing, if required to stabilize portions of partially remaining structures during the removal sequence or support partially remaining structures after staged removals. The removal plan shall

include design computations and detail drawings for all temporary supports, shoring and bracing that indicate the exact placement of the temporary supports, shoring or bracing; verification of design loads; attachment details; and methods for the safe transfer of loads from existing structural elements to be removed to the temporary supports, shoring, or bracing. Temporary support, shoring, or bracing design computations and drawings details are to be prepared, signed and sealed by a professional engineer registered in the State of Wisconsin.

6. Design and details of temporary support foundations. Foundation design shall include evaluation of expected foundation settlement and the effect that this will have on the structure being supported. Temporary support foundation design computations and drawing details are to be prepared, signed and sealed by a professional engineer registered in the State of Wisconsin.

7. Equipment type and locations of equipment on the structure(s) or adjacent roadways during the removal operations

8. Locations and type of work to be performed directly adjacent to traffic.

9. Details and locations of protective covers and other measures to ensure that people, property and improvements will not be endangered or damaged as a result of the removal operations. This shall include methods for protecting any pavement surfaces including shoulders, concrete barriers, and other highway features.

10. Methods of removal, proposed haul route(s) and disposal, the proposed haul route, method of hauling, and proposed destination.

11. A schedule of anticipated roadway and lane closures to accommodate removal operations. Include the timing of individual lane or temporary roadway closures and the nature of removal operations that will be performed during the lane or roadway closures.

12. Acknowledgement that the contractor and removal design engineer responsible for preparing the removal plan have visited the site and reviewed the existing structure plans in preparing the removal plan.

(7) Structure Pre-Removal Meetings

After submission of the Structure Removal Site Safety Plan and required Structure Removal Plan(s), schedule and conduct structure pre-removal meetings at a time agreed to by the engineer. Hold structure pre-removal meetings at least three working days prior to beginning structure removal activities. If the engineer agrees in advance, multiple structure removals can be combined and discussed at one structure pre-removal meeting. Otherwise schedule and conduct a separate structure pre-removal meeting for each structure to be removed.

Supplement 203.3.2.1 of the standard specifications with the following:

(4) Perform structure removals in accordance with the submitted Structure Removal Site Safety Plan and applicable Structure Removal Plans.

Supplement 203.5.1(2) of the standard specifications with the following:

Payment includes preparation and submittal of a Structure Removal Site Safety Plan; preparation and submittal of Structure Removal Plans and performing all structure removal work in accordance with the submitted plans.

86. Storm Sewer.

Remove entire article language and replace with the following:

Supplement standard spec section 204.3.2.2 with the following:

(15) Material placed within storm sewer trenches is subject to the quality control for the zone that the material is located in and shall conform to QMP Subgrade article listed elsewhere in this special provision document.

Supplement standard spec section 204.5.1 General with the following:

(7) QMP sampling, testing and documentation is incidental to removing storm sewer bid item and no separate payment will be made.

Supplement standard spec section 607.3.1.1 General with the following:

(9) Review the Plans, Specifications, and existing site conditions prior to bidding to ascertain the extent of the work requiring shoring.
(10) Exercise additional caution when constructing sewers in close proximity to utilities, structures, and live traffic lanes.
(11) Proposed utilities are not shown on the plans. Review "Utilities" article for abandoned, relocated, adjusted, and/or new utility facilities prior to bidding.
(12) To facilitate drainage, maintain concrete barrier temporary precast drainage/lifting slot holes free from debris.
(13) Provide a shoring design and installation sequence for each location when shoring is used. Have a professional engineer, registered in the State of Wisconsin and knowledgeable of the specific site conditions and requirements verify the adequacy of the design. Submit one electronic copy in portable document format of each shoring design, signed and sealed by the same professional engineer verifying the design, to the engineer for incorporation into the permanent project record.
(14) Shop drawings are required for all drainage structures. For structures where WisDOT standard detail drawings are not available, provide shop drawings prepared, verified and stamped by a professional engineer registered in the State of Wisconsin. Submit one electronic copy of shop drawings in portable document format for engineer's review two weeks prior to start fabrication. Show clearly on shop drawings information for all pipe connections to the structure. The contractor is responsible for all errors of detailing and fabrication. The omission from the shop drawings of any pipe connection shall not relieve contractor of the responsibility of furnishing and installing such materials, even though the shop drawings may have been and reviewed and accepted by the engineer.

Replace standard spec section 607.3.5(1) Backfilling with the following:

Conform to backfill detail as shown on the plan. Backfill all trenches and excavations of all new storm sewer and storm sewer structures not occupied by Backfill Controlled Low Strength or stone chips immediately after completing the sewer work with backfill material conforming to section 209 of the standard specifications. Backfill locations where existing storm sewers or existing storm sewer structures have been called for removal or abandoning, not occupied by the new traveled way or occupied by Backfill Controlled Low Strength, immediately after completing the sewer work with native backfill above stone chips and conforming to detail shown on the plan.

Supplement standard spec section 607.3.5 Backfilling with the following:

(8) Material placed within storm sewer trenches is subject to the quality control for the zone that the material is located in and shall conform to QMP Subgrade article listed elsewhere in this special provision document.

Supplement standard spec section 608.3 with the following:

Provide rubber gasket joints for all storm sewer pipes except for horizontal elliptical pipe rise greater than 40-inches use mastic joint compound. Place rubber gasket over the spigot end or tongue of the entering pipe. Clean the gasket and the ends of the pipe from sand and gravel. Place the spigot or tongue of the pipe being laid with the gasket in place into the bell or groove end of the previously laid pipe. Set pipe carefully to line and grade, and push or jack home. The engineer can order the use of a jack or "come-along" if deemed necessary to ensure that the joints are completely tight.

Place rubber gasket over the spigot end or tongue of the entering pipe. Clean the gasket and the ends of the pipe from sand and gravel. Immediately before making the joint, lubricate the outside of the gasket and the inside of the bell or groove of the last pipe with an approved vegetable lubricant. Place the spigot or tongue of the pipe being laid with the gasket in place into the bell or groove end of the previously laid pipe. Set pipe carefully to line and grade, and push or jack home. The engineer can order the use of a jack or "come-along" if deemed necessary to ensure that the joints are completely tight.

Replace standard spec 608.5(2) with the following

Payment for the Storm Sewer Pipe bid items is full compensation for providing all materials, including all special Y's, mitered sections, elbows and connections required; for excavating and wasting excess material, except rock excavation; for providing rubber gaskets; for supporting utilities in storm sewer trench; for shoring design, providing a signed and sealed copy of the design; for installation, monitoring, and removal of shoring; for forming foundation; for laying pipe; for sealing joints and making connections to new or existing features; stone chips; granular backfill material, including bedding material; for backfilling; for QMP sampling, testing and documentation; for maintaining concrete barrier temporary precast drainage/lifting slot holes to keep free from debris; for cleaning out; and absent the pertinent contract bid items, for restoring the work site.

156. DELETED.

337. Ductile Iron Water Main 6-Inch, Item SPV.0090.5004, Ductile Iron Water Main 8-Inch, Item SPV.0090.5005, Ductile Iron Water Main 12-Inch Restrained Joint, Item SPV.0090.5006, Ductile Iron Water Main 16-Inch, Item SPV.0090.5007, Ductile Iron Water Main 16-Inch Restrained Joint, Item SPV.0090.5008, Ductile Iron Water Main 24-Inch Restrained Joint, Item SPV.0090.5009.

Add the following after **B.2 Valve Box Adapter**:

B.3 Fluorocarbon Gaskets
Furnish fluorocarbon gaskets for ductile iron water main within contaminated soil limits from station 15BLWM+11.1 to station 16BLWM+65, as shown on plans and as directed by engineer. Fluorocarbon gaskets shall conform to ASTM D-2000, designation 5BG615A14B24.

Replace entire language under **C Construction** with the following:

C Construction
C.1 General
Ductile Iron Water Main 6-Inch, at Stations 49CH+48.7, 992AD+86.7, 998+57.7, 1001AD+16.2, 1011AD+55.10, 31.5'R, 1014AD+13.1, 31.7'R, and 1016AD+96.0, 4.4'L include 6-inch gate valve installations. All costs for completing the work required for the valve installations including valve boxes and extensions is to be included in the price for furnishing and installing 6-inch water main under this item.

Ductile Iron Water Main 8-Inch, at Stations 49CH+57.2, 14CHWM+01.7,18CHWM+13.5, 19CHWM+93.4, 983AD+68.7, 987AD+22.4, 987AD+75.5, 990AD+23.5, 740FA+98.2 and 10CRWM+87.5 includes 8-inch gate valve installations. All costs for completing the work required for the valve installations including valve boxes and extensions is to be included in the price for furnishing and installing 8-inch water main under this item.

Ductile Iron Water Main 16-Inch, at Stations 10BLWM+69, 16BLWM+79, 49CH+53.7, 10CHWM+68.4, 14CHWM+25.6, 16CHWM+44.6, 989AD+98, 995AD+92.1, 998AD+27.3, 1002AD+02, 1002AD+05, 1004AD+01.2, 1010AD+92.6, 1011AD+15.4, 1011AD+76.1, 1014AD+34.9, 1016AD+48.5, 1019AD+29.9, 1019AD+39.1, 1019AD+49.2, 1019AD+53.8, 1023AD+36.6, 741FA+62.9, 11BCWM+25.0, 15BCWM+45.0, 19BCWM+45.0, and 23BCWM+45.0 include 16-inch butterfly valve installations. All costs for completing the work required for the valve installations including valve boxes and extensions is to be included in the price for furnishing and installing 16-inch water main under this item.

Ductile Iron Water Main 24-Inch Restrained Joint, at Station 28BCWM+41.9 includes a 24-inch butterfly valve installation. All costs for completing the work required for the valve installation including valve boxes and extensions is to be included in the price for furnishing and installing 24-inch water main under this item.

Install fittings as shown on plans, incidental to respective ductile iron water main item. A list of fittings for each water main installation is provided on plans.

Abandon existing water mains as shown on plans unless scheduled for removal in the utility removal plans. All costs for the abandonment of existing water main are to be included in the price for the Ductile Iron Water Main item(s). All costs for the removal of the existing water main are paid under a separate item.

The Milwaukee Water Works will shut off the water main to be altered and provide temporary hose connections to affected services as required.

C.2 Fluorocarbon Gaskets

Install fluorocarbon gaskets for ductile iron water main within contaminated soil limits from station 15BLWM+11.1 to station 16BLWM+65, as shown on plans and as directed by engineer. All costs for furnishing and installing the fluorocarbon gaskets are to be included in the price for the water main item.

Replace entire language under **E Payment** with the following:

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5004	Ductile Iron Water Main 6-Inch	LF
SPV.0090.5005	Ductile Iron Water Main 8-Inch	LF
SPV.0090.5006	Ductile Iron Water Main 12-Inch Restrained Joint	LF
SPV.0090.5007	Ductile Iron Water Main 16-Inch	LF
SPV.0090.5008	Ductile Iron Water Main 16-Inch Restrained Joint	LF
SPV.0090.5009	Ductile Iron Water Main 24-Inch Restrained Joint	LF

Payment is full compensation for providing all labor, equipment, materials, valves, valve boxes, valve box extensions, gaskets, fittings, and accessories required; for furnishing all surveying; excavating,

for sheeting and shoring; for forming foundation; for laying pipe; for removing valves; for installing all valves, air vents, and fittings; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for providing granular backfill material, including bedding material; for backfilling; for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

340. Abandoning Sanitary Sewer 8-Inch, Item SPV.0090.5100, Abandoning Sanitary Sewer 12-Inch, Item SPV.0090.5102.

Remove entire article 340 and replace with the following:

340. Abandoning Sanitary Sewer 8-Inch, Item SPV.0090.5100, Abandoning Sanitary Sewer 12-Inch, Item SPV.0090.5102, Abandoning Sanitary Sewer 24-Inch, Item SPV.0090.5120.

A Description

Perform the work in accordance to the plans, the Standard Specifications for Highway and Structure Construction, latest edition and amendments, the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), the "Special Provision Notes for Sanitary Sewer Work" as found in the plans, and as hereinafter provided and these special provisions.

Notify the Milwaukee Metropolitan Sewerage District (MMSD), City of Milwaukee, City of Wauwatosa or "facility owner" of the commencement of construction at least three district business days in advance. Notify, in writing, all businesses and property owners/occupants within the project limits to inform them of the project and to inform them of any temporary sewer service disconnections. Provide and maintain all necessary bypass pumping for sanitary sewer abandonment.

B Materials

All materials and work required to abandon existing sanitary sewers will conform to the SSSW.

B.2 Cellular Concrete

Provide cellular concrete meeting the following specifications: 1 part cement, 1 part fly ash, 8 parts sand, or an approved equal, and water. Provide cement meeting the requirements of standard spec 501.2.1 for Type 1 Portland Cement. Provide sand meeting the requirements of standard spec 501.2.5.3. Provide water meeting the requirements of standard spec 501.2.4.

C Construction

Abandon sewers in accordance to Section 3.2.24 of the SSSW except modified to require all sewers which are to be abandoned and have not been removed shall be filled with cellular concrete. Field verify all active sewer laterals connected to the new sewer main prior to abandonment of any sewer. Bulkhead sewers that are to be abandoned in place with an 8-Inch brick or concrete wall and in accordance to the SSSW.

Provide by-pass pumping of wastewater round construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Abandon Sanitary Sewer 8-Inch, Abandon Sanitary Sewer 12-Inch, and Abandon Sanitary Sewer 24-Inch by the linear foot of sewer acceptably completed. The pipe will be measured horizontally to the nearest foot, through all manholes designated to be abandoned, from face to face of bulkheads, including the bulkhead thickness.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5100	Abandoning Sanitary Sewer 8-Inch	LF
SPV.0090.5102	Abandoning Sanitary Sewer 12-Inch	LF
SPV.0090.5120	Abandoning Sanitary Sewer 24-Inch	LF

Payment is full compensation for providing all materials including all excavating; for bulkheading and abandoning existing sanitary sewer with cellular concrete; for providing backfill slurry material; and for providing and maintaining all necessary bypass pumping for abandonment.

349. Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-III 77x121-Inch, Item SPV.0090.8002; Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 77x121-Inch, Item SPV.0090.8003; Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 38x60-Inch, Item SPV.0090.8004.

Replace entire language under **C Construction** with the following:

C Construction

Construct in accordance to the plans and standard spec 610.3.

Provide rubber gasket joints for Horizontal Elliptical Class HE-IV 38x60-Inch. Provide mastic joint compound for horizontal elliptical pipe rise greater than 40-Inches. Clean the gasket and the ends of the pipe from sand and gravel. Place the spigot or tongue of the pipe being laid with the gasket in place into the bell or groove end of the previously laid pipe. Set pipe carefully to line and grade, and push or jack home. The engineer can order the use of a jack or “come-along” if deemed necessary to ensure that the joints are completely tight.

Replace entire language under **E Payment** with the following:

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.8002	Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-III 77x121-Inch	LF
SPV.0090.8003	Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 77x121-Inch	LF
SPV.0090.8004	Storm Sewer Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 38x60-Inch	LF

Payment will conform to standard spec 610.5 and submitting one copy of storm sewer pipe design, signed and sealed by a professional engineer registered in the State of Wisconsin.

No separate payment will be made for placing and or installing rubber gasket and mastic joint compound.

382. Burleigh Water Booster Station, Item SPV.0105.5002.

Replace entire article language and replace with the following:

A Description

This special provision describes designing, furnishing, installing, maintaining, removing, and transporting a temporary water booster pump system at Burleigh Street and includes the installation of two riser pipes connected to the existing 16-inch water main as detailed in the plans along with the required pumping system needed to maintain the required system pressure. This system will need to be tested and operational before the existing 24-inch water main at Wisconsin Avenue can be taken out of service.

Perform work under this item in accordance to the plans, standard specifications, Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments (SSSW), and as hereinafter provided and these special provisions.

B Materials

B.1 General

All materials and work required for water main will conform to the SSSW.

Supply two riser pipes for connection to the existing 16-inch water main and two ½-inch sample ports with pressure gauges ranging from 0 psi to 100 psi as shown on the plans. The lower riser pipe assembles will be capped off and left in place after construction.

Provide 2-foot by 2-foot concrete thrust blocks conforming to section 4.3.13 of the SSSW.

Furnish concrete conforming to section 501 of the standard specifications for use as a concrete pad.

Power the pumping system using a portable generator with cable.

B.2 Skid Mounted Temporary Booster Station

Design, furnish, and install a skid mounted temporary booster station. The contractor shall supply a skid mounted booster station. The station shall be able to connect with hard piping to the proposed 16 inch suction and discharge piping as shown on the plans. The station will have a connection terminal for a stand-by generator to supply power for operation. Construction shall be of modular form utilizing a steel base structurally adequate to support pumps, piping, tanks, and electrical equipment as a single integral assembly. All nuts, bolts, washers, and fasteners shall be stainless steel, zinc or cadmium plated for corrosion resistance. It shall be vented to provide proper operating temperatures.

System Operational Parameters are as follows:

- Peak flow rate of 3,000 gallons per minute
- System shall be supplied a minimum suction pressure of 35 PSI
- System rated maximum discharge pressure of 85 PSI
- Power shall be 3-phase 460 volts
- Maximum skid footprint of approximately 12’ X 10’

B.2.1 Pumps

Furnish three end suction pumps with mechanical seals, each rated at 1,000 GPM at 120’ TDH. Pumps shall operate at 85% efficiency.

Pumps shall be electric motor driven, horizontal centrifugal with mechanical shaft seal, volute case and impeller.

The shaft seal shall be a self-adjusting mechanical type to prevent leakage and eliminate the need for drain piping. The volute case shall be precision machined from gray cast iron and engineered to modern hydraulic standards. It shall be possible to rotate the discharge connection to any of four positions. A heavy cast iron bracket shall maintain alignment between the motor and volute cast.

The impeller shall be an enclosed type and balanced to provide smooth operation.

The impeller is to be keyed to the shaft and locked with a special cap screw and washer. The motor shaft is to be manufactured from high grade steel and of reduced length to increase shaft rigidity, extend bearing life, and reduce the overall length of the pump and motor assembly. The pump shaft shall be protected with a replaceable stainless steel sleeve.

The pump motor and impeller shall be removable from the back of volute case for service without disturbing the plumbing.

B.2.2 Motors
Furnish three 40 HP motors, 1800 rpm TEFC 92% efficient motors, conforming to MG-1 part 32 for use on inverter with winding temperature switches and motor space heaters.

Each pump motor shall be a squirrel cage induction horizontal solid shaft type. The pump impeller shall be direct mounted and keyed to the motor shaft with a stainless steel protective sleeve. The temperature rise of the motor shall be to NEMA Standard MG 1 12.42 for class B or Class F insulation.

Radial and thrust bearings of ample capacity to accommodate the hydraulic thrust of the pump shall be incorporated into the motor. The motor shall be of proper size to drive the pump at any point on its operation curve without exceeding the percent of motor horsepower nameplate rating.

Each main pump motor will be supplied with a 120 volt space heater in the motor windings to prevent condensation during non-use times. The heaters will be deactivated while the motors are running.

B.2.3 Piping
All fabricated manifolds and piping shall be 316 stainless steel. Discharge piping shall be ASTM 53. All welded fittings shall be seamless, conforming to ASTM Specification A234, with pressure rating not less than 150 PSI.

B.2.4 Check Valves
Pump check valves shall be located on the discharge of the pump and sized per the technical data sheet. They shall be of the silent operating type that begins to close as forward velocity diminishes and be fully closed at zero velocity preventing flow reversal. Valve bodies shall be cast from ASTM-126C cast-iron or better and shall be free from blow holes, sand holes, and other impurities. The valve design shall incorporate a center guided, spring loaded poppet, guided at opposite ends and having a short linear stroke that generates a flow area equal to the pipe diameter. Internals shall be machined bronze disc, seat, and stem guide. Valves shall be sized to permit full pump capacity to discharge through them without exceeding a pressure drop of 2.5 PSI... Valves 4” and smaller to be pressure rated for 250 PSI, 6” to 10” to be pressure rated to 150 PSI. Valves 12” and larger check valves to be globe style with 150 PSI rating, iron bodied with bronze trim.

B.2.5 Isolation Valves
Each pump shall be isolated by means of a butterfly valve after the check valve and before the discharge manifold. The discharge manifold shall also have an isolation valve at the skid edge. Isolation valves shall be butterfly type with ten position lever for valves 4" and smaller or gear operators for valves 5" and larger, rated for 200 PSI WOG working pressure. Trim shall include stainless steel stem, bronze or nickel coated iron streamlined disk with full faced resilient seat design to eliminate need for flange gaskets.

Provide one 10” inlet and one 10” outlet flanged connection with 8” lug style 150PSI butterfly valves.

B.2.6 Electronic Butterfly Valves
Provide an automatic by-pass back-up mode for constant pressure regulation in the event of VFD failure. The back-up mode shall automatically function on the fly during an event of a VFD failure,

without loss of flow. The VFD back–up mode must provide constant pressure at variable flow without causing line surge. Utilizing the pressure relief valve is not an acceptable automatic back up mode due to its inability to provide surge free constant pressure regulation at variable flow demand. The automatic VFD by-pass mode shall be either controlled hydraulically through a pressure-regulating valve per pump or EBV (electronic butterfly valve(s). The pump station discharge pressure shall be regulated to provide surge-free constant pressure as programmed via the control panel operator interface. Discharge pressure shall be regulated by an Electronic Butterfly Valve, consisting of the following:

- Gradual entry of water from the EBV pump into the discharge manifold to allow for complete purging of pump column air and elimination of surges.
- Maintain programmed downstream pressure regardless of discharge flow.
- Up to six, user adjustable PID control settings to ensure accurate pressure regulation at all flows, programmed pressure, or connected pump combination.
- Adjustable pressure ramp-up and ramp-down to assure surge free pressure regulation.
- After a drop in pressure, gradually increase system pressure over a user adjustable period of time to eliminate surging.
- Rate of change of pressure control to anticipate and eliminate rapid pressure changes caused by changing system demand.

Adjustment of regulated downstream pressure shall be accomplished though the control panel operators interface. Individual pressure regulating valves shall be butterfly type with electric motor gear actuation. The maximum allowable pressure drop across the butterfly valve at full pump capacity shall not exceed one PSI. The Butterfly Valve shall be rated for not less than 285 PSI.

B.2.7 Flow Meter

The pump station shall have a 8” magnetic flow sensor installed, which shall be utilized to control and display the pump station flow rate and to display total gallons pumps through the touch screen operator interface device mounted on the control panel door. The flow meter shall be electromagnetic design comprising of two major components, a primary head and a signal converter. The flow meter signal converter shall produce two separate signals, pulse and 4-20ma, in linear proportion to flow rate. Flow meter shall read flows from 0-40 fps, with a worst-case inaccuracy of +/-0.5% of reading with +/- 0.2% repeatability. Flow meter shall be sized so that maximum system flow lies between 16 and 24 fps through the meter. The primary meter head shall incorporate a straight-thru flow design with no moving parts or pressure loss, low maintenance and high accuracy. Meter shall be installed according to manufacturer’s recommendations.

The flow tube shall be an ANSI B16.5 class 150 flanged for sizes less than 24”. Wetted liner shall be hard rubber. Liner shall extend beyond the ends of the flow tube and over the flanged faces. The electrodes shall be Hastelloy.

The signal converter shall be a NEMA 4 rated, and shall house the microprocessor-based electronics required for magnet excitation and flow measurement.

The meter shall be calibrated during the pump station full run performance testing while at the factory prior to shipment. The magnetic flow sensor on the pump station shall be calibrated against a master meter. The manufacturer’s test and calibration equipment shall be certified and shall be re-certified every three years.

B.2.8 Pressure Relief Valve

A 4” pressure relief valve shall be installed on the discharge piping downstream of the pressure regulating valves and check valves. The valve shall be sized to bypass sufficient water back to the water source to avoid the discharge pressure from exceeding the maximum programmed pressure set point by more than 10 PSI. A 4” 150 PSI lug style butterfly isolation valve will be installed

upstream of the relief valve to facilitate service, and 4” 150 PSI lug style butterfly isolation valve on the discharge.

B.2.9 Sampling Valve
Furnish a 1/2” brass sampling tap on the discharge manifold upstream of the main station isolation valve.

B.2.10 Wash Down
Furnish a 3/4" brass hose bib on the discharge manifold upstream of the main station isolation valve.

B.2.11 Drains
Provide a drain in the discharge manifold upstream of the main station isolation valve.

B.2.12 Air Release Valve
Provide a 1” air release valve with isolation valve in the discharge manifold upstream of the main station isolation valve.

B.2.13 Pressure Transducer and Gauge
A solid state pressure transducer, one each on the inlet and discharge of the pump skid, shall provide a noise free, linear output proportional to discharge pressure. Transducer shall be solid-state, strain gauge type with integral voltage regulation and output accuracy not less than 0.25%. Transducer shall be constructed of stainless steel and rated for the pump station discharge pressure called out in the manufacturer’s technical specifications.

A pressure gauge shall be located on each pressure transducer for the purpose of measuring regulated, downstream pressure. Pressure gauge shall be 304 stainless steel case and bezel construction. Gauge shall be 4" diameter, liquid filled. Pressure sensing connection shall be 1/4" NPT lower gauge connection.

B.2.14 Base
Provide a base that can be fastened to the skid for multiple installations.

B.2.15 Painting
The entire unit shall consist of a multistep coating system including metal preparation, a rust prohibitive epoxy prime coat and a two part ultraviolet insensitive polyurethane finish having a total dry film thickness of not less than 5 mils. Each coat will be applied and baked for one half hour at 165 degrees F. All pump station components including skid, manifolds, isolation and relief valves, grooved clamps and supports shall be painted medium green. All electrical enclosures and accessory panels and tanks shall be appliance white.

B.2.16 Control Panel
The pumping station electrical controls shall be mounted in a self-containing NEMA 4 enclosure fabricated from not less than 12 gauge steel. Door gasket seals shall be neoprene sponge, sufficient to protect interior components from weather and dust. The electrical panel doors shall be constructed from 12 gauge steel with integral latches. All external operating devices shall be dust and weather proof.

All internal components of the enclosure shall be mounted on a removable back panel. Mounting screws for components shall not be tapped into the enclosure wall. No pressure gauges, pressure switches, water activated devices, or water lines of any sort shall be installed in any electrical control panel.

The pump station manufacturer shall provide within their control panel, fluorescent internal lighting that is switch activated. The light fixture should be mounted on the top of the enclosure and should be capable of illuminating the entire inside of the enclosure.

Skid wiring shall conform to National Electrical Code Standards. All wiring from control panels to motors shall be in metal reinforced, water tight, flexible conduit with copper conductors rated not less than 600 volts and of proper size to carry the full load amperage of the motors without exceeding 70% capacity of the conductor. Flexible conduit runs shall not exceed six feet in length. A grounding cable sized to National Electrical Code requirements shall be included in the flexible conduit. There shall be no splices between the motor starters and the motor connection boxes.

Wiring to flow sensors, and pressure transducer shall be multi conductor shielded cable suitable for Class II low voltage controls. Wiring to motor operated valves,(option available for VFD stations), shall be in flexible conduit with TFFN #18 gauge copper conductors rated not less than 600 volts.

Corrosion inhibiting modules shall be installed in all electrical enclosures in accordance with the manufacture's recommendations.

A closed type cooling system (air conditioner) shall be included to cool the enclosure and reject heat from the VFD. Open type cooling systems allowing outside ambient air to enter the panel are not acceptable. No water line connections shall be permitted inside of the control enclosure.

The control panel shall be designed, built, tested and U.L. listed by the pump station manufacturer.

Each motor shall be protected by a MSP combination starter and breaker. Device will be UL 508 Type F. Motor starter protector and contactor are electrically and mechanically linked by means of a link module and adapter plate. All starters are suitable for use in group installation applications according to NEC-430-53(c).

Premium 460/120/24 voltage surge protection, 200kA (8/20ms) transient amps on incoming power, 25kA (10/350ms) transient amps on 120 volt power, 20kA (8/20ms) on analog circuits.

A control transformer shall provide 120 volt power to the pump station controls. The control transformer shall be protected on primary and secondary sides with appropriately sized fuses. No load other than the pump controls shall be supplied by the control transformer.

Single pole secondary distribution breakers with appropriate ratings shall supply power to each pump starter coil circuit, the control system and to other circuits as specified.

Main service disconnect, a three-pole, main station disconnect shall be contained within the NEMA 4 control enclosure. An externally mounted service disconnect shall not be acceptable. Disconnect shall be non-fused and isolate all power to the control enclosure. The disconnect shall have an operating handle mounted in the enclosure door, mechanically interlocked to prevent entry while disconnect is in ON position.

Phase Monitor, the incoming power and each motor shall be protected by a phase loss/low voltage system dropout relay to de energize the pump station control circuit or motor contactor if a phase failure, phase reversal or low voltage condition occurs. If after attempted automatic re-starts the phase failure/low voltage alarm condition remains, the alarm must be manually reset. Individual motor overloads will also act as phase monitors for each motor.

Provide a dedicated VFD for each motor. The variable frequency drive shall be IGBT based with selectable carrier frequency up to 15 KHZ. The VFD shall include terminals for incoming power, motor output power and control terminals.

The VFD shall generate a sine-coded, variable voltage/ frequency, three phase output for optimum speed control. The VFD shall incorporate power loss ride-through for a minimum of 2 seconds. VFD protective features shall include current limit, auto restart, short circuit protection, electronic motor overload protection and ground fault protection. The VFD shall have a push button programming

display for easy access to operation parameters. The VFD shall be protected on the primary side a breaker of the appropriate amperage and include:

- Overload capacity: 120% rated output current for one minute
- Voltage Fluctuation: +10%, -15%
- Sine wave, PWM, with full range, automatic torque boost
- Frequency Control Range: 0.5 to 500Hz
- Frequency Accuracy: Digital, 0.01Hz, Analog, .1%
- Motor overload protection
- Instantaneous over current of 180% of rated output curren
- Over voltage at 820VDC if 460V input
- Under voltage: user adjustable
- Momentary Power Loss: up to 2 second ride through
- Electronic Ground Fault
- LED capacitor charge indicator
- Input Phase loss alarm
- Ambient temperature range of + 0 to 50 degrees C
- Humidity of 95% non-condensing.

B.2.17 PLC

Furnish a microprocessor controls with software to maintain constant pressure at variable flow.

The pump sequence controller shall be an industrial grade PLC with diagnostic LEDs for monitoring of discrete inputs and outputs. Not less than two additional analog inputs and outputs shall be standard for monitoring and control purposes. The PLC shall contain RS232 and RS485 communication ports for monitoring and programming purposes. The PLC shall contain an EEPROM, battery backed RAM and non-volatile memory for storage of critical configuration data. The PLC will have a high speed counter, clock and calendar function with year, month, day, hour, minute, and day of week.

The pump station controls shall be capable of changing the regulated downstream pressure while in operation, based on discharge flow or discrete input as called out by the technical specifications. The pump station controls shall also be capable of up to six, user adjustable pressure regulation set points based on discharge flow or one additional set point based on a discrete input. In addition to adjustment of downstream pressure, the controls shall be capable of up six pressure regulation algorithms to insure accurate pressure regulation regardless of regulated pressure, discharge flow or connected pump combination.

Lead selection of equal horsepower pumps shall be accomplished by total accumulated pump running time. Unless manually overridden, the pump with the lowest accumulated running time shall be the next pump started in the sequence. Alternating logic for selection of lead pump shall not be accepted.

B.2.18 Operator Interface

Operator interface shall be a LCD color display type unit mounted in the enclosure door. Touchscreen operator interface device with active matrix LCD display unit mounted in the enclosure door. Operator interface shall be used for logical display of all pump station functions. The operator interface shall be NEMA 4 rated. The operator interface shall be touch sensitive with intuitive on-screen user instruction for ease of operator use. The use of buttons or keys or off-screen user instructions shall not be permitted. The operator interface shall be LCD color display type with no less than 640 x 480 pixel resolution, with viewing area measuring not less than 7.5" diagonal. User memory for storing critical pump operation data shall not be less than required for up to 1 year of data.The display features shall include:

- Digital flow (GPM) and pressure (PSI) display
- Both cumulative and resettable gallons pumped indicators
- Pump ready/running status with elapsed run time display per pump
- Flow-based pressure regulation to match discharge pressure
- Individual motor overload reporting
- Minute by minute data logging saved to a removable flash RAM card
- 32MB card to store approximately 12 months of data
- Historic & real time X-Y plotting of pump station operation
- Filter controls
- Alarm log file
- Ability to change system parameters such as set-point pressure, time delays

The operator interface shall allow the user to view and modify all pertinent operation parameters. The operator interface shall incorporate password protection for modification of critical pump station parameters. The operator interface capabilities shall include but are not limited to the following:

- Overview screen showing pump system configuration. Screen shall show if each individual pump is enable or disabled, the number of hours on each pump, station full flow and pressure design criteria.
- System screen with information on current regulation pressure, set-point, regulation pressure, System status, restarts remaining, VFD reference speed, pressure regulation method (VFD or EBV modes) and adjust settings button. Adjust settings button will allow changing parameters etc. after entering password.
- Settings menu to allow changes to pressure regulation settings, pipe saver mode, VFD manual mode, analog calibration, flow calibration, program or register settings.
- Flow screen will display pressure in PSI, flow in GPM and total gallons pumped in thousands of gallons. Separate display for total gallons pumped since last reset.
- Alarm status with time stamping, display of pump station conditions at shutdown and restart. Alarms will be displayed in red when activated and a separate listing will be displayed in green when the alarm is reset. Alarms will be logged to a compact flash disk allowing the service technician to upload data to a spreadsheet type program.
- Full control of and capability of monitoring, adjusting and viewing any options present such as water level, inlet strainer, wye strainer, filtration, chemical injection, or liquid tank levels. Adjustment of automatic/manual pressure regulation set points.
- Graphing capability for up to 4 full year detailing flow rate and pressure. Graphing function shall give option to graph and plot a point every minute. The graph function will be selectable by day, month and year as well as the time of desired graph. All data will be logged to a compact flash disk allowing the service technician to upload data to a spreadsheet type program.
- H.O.A. selector switch for each pump
- Pump run pilot light (green)
- Control power pilot lights (white)

B.2.19 Alarms

Controls shall shut down the pump station in the event of the following alarm conditions. The controls shall attempt to restart the system after alarm shutdown or loss of power to minimize loss of flow. After a user adjustable number of attempts to re-pressurize the system, the controls will go into hard shut down and remain there until manually reset.

- Low discharge pressure cutout. Pressure remains 20 PSI below regulate set point for set time delay.
- Low inlet pressure shutdown or loss of prime shutdown.
- High discharge pressure cutout. Pressure remains 11 PSI above regulate set point for set time delay.
- Phase/ voltage cutout. High or low voltage, loss of phase or phase reversal.
- High pump volute temperature cutout. Pump temperature stays above 120 degrees F. for a set time delay.
- Starter fail cutout. Output to starter is not met with corresponding running input for set time delay. Indicates overload, phase imbalance or control fuse.
- VFD fault and VFD bypass status.

B.2.20 Testing
The pump station manufacturer shall conduct and document a complete factory dynamic test of the pump station prior to shipment. Pump station shall be tested throughout the entire operating range at the net discharge pressure called for in the technical specifications. Individual pump pressure, flow, RPMs, volts, amps, KW and power factor shall be documented for verification by the engineer prior to delivery.

B.2.21 Startup
Technical start up shall be furnished by the pump station manufacturer or a qualified service agency. Mounting details shall be furnished by the pump station manufacturer. Electrical connection, will be provided by the contractor and, shall consist of a single conduit from owners disconnect to the pump station main disconnect. Additional responsibility shall include confirming correct motor rotation and securing local inspection/approval. Include one day of service.

Technical start up procedures by the pump station technician shall include the following:
- Station start up and pressurization.
- Pressure, flow and programming adjustments.
- Monitoring of complete flow
- Customer training and presentation of owner's manual.

B.2.22 Warranty
The manufacturer shall warrant the pumping station to be free of defects and product malfunctions for a period of four years after shipment.

B.2.23 Submittals
Submit all shop drawings for the skid mounted temporary booster station, design information confirming the System Operational Parameters, outline sketches showing principal dimensions, and operation and maintenance manuals to the engineer and representative of the City of Wauwatosa Water Utility prior to ordering and installing any materials required for the work.

The engineer must approve all materials, design information and submittals prior to the contractor ordering and installing any materials required for the work.

B.2.24 Training
Provide training to the City of Wauwatosa Water Utility regarding proper operation and maintenance of the equipment. One training session is required at the site. Contact Jim Wojcehowicz at (414) 479-8965 to coordinate the training.

B.3 Backfill
B.3.1 Clear Stone

Furnish ¾-inch clear stone in accordance to the pertinent requirements of section 8.43.6 of the SSSW.

B.3.2 Backfill Slurry

Use fine aggregate and number 1 coarse aggregate conforming to section 501.2.5.3, and water conforming to section 501.2.4 in the Backfill Slurry mix. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily. Submit a mix design for the engineers review prior to placement. Backfill Slurry is considered as mix class III and the department accepts the mix by certification. Mix acceptance and testing in the field is not required.

C Construction

C.1 Water Main

At least twenty working days prior to beginning work on the Burleigh Water Booster Station, contact Mr. Jim Wojcehowicz, Water Superintendent for the City of Wauwatosa Water Utility, 7725 W. North Ave, Wauwatosa, WI 53213, at (414) 479-8965. Set up and attend a preconstruction meeting with the City of Wauwatosa and the engineer.

Install two riser pipes connected to the existing 16-inch water main as shown on the plans. The two riser pipes are located one on each side of an existing pressure PRV. The PRV steps down the water pressure from 90 psi to 40 psi. During construction of the new 24-inch water main at Wisconsin Avenue, the 90 psi zone will lose service, and the booster pump will need to maintain this zone pressure.

The existing PRV will need to be adjusted before the temporary booster pump can be made operational. The existing PRV will provide relief during low water usage.

Install all fittings, valves, flanges, ductile iron pipe, concrete thrust blocks, and sample ports required to complete the project as shown on the plans. Install the skid mounted temporary booster station per the manufacturer's recommendations.

Excavate and install a 12-foot by 10-foot concrete pad having a minimum thickness of 5 inches as shown on the plans and is flushed with the adjacent ground elevation. Bolt and secure the pump skid to the concrete pad in accordance to the manufacturer's recommendations or as directed by the engineer.

All equipment shall be suitably protected from the environment and freezing. Provide a heated air enclosure if the operating temperature in below 32 degrees Fahrenheit.

Flush the system after the ductile iron piping connections are complete. Pressure test the system to 150 psi. Collect and test water samples. Submit reports for two safe water samples taken 24 hours apart to the City of Wauwatosa. The City of Wauwatosa will review the results and provide acceptance no later than 48 hours from receiving the reports. The City of Wauwatosa must confirm the safe water results before the temporary booster pump system can be operated. After the safe water results are confirmed, test the temporary booster pump system for a one week trial run to be completed 5 days before the system can be put into service.

Provide a portable restroom facility outside the roadway within right of way at a location approved by the engineer. Do not obstruct sight distance for the traveling public.

The City of Wauwatosa Water Utility will provide an operator on site for 24 hours per day when the temporary booster pump system is in operation. An operator is required 24 hours per day for the one week trial run period and for the entire duration the 24-inch water main at Wisconsin Avenue is out of service. At least two weeks prior to needing an operator, contact Jim Wojcehowicz at (414) 479-8965 to coordinate the schedule for operation.

After the engineer determines the temporary water booster station is no longer required, dewater riser pipe assembles. Remove and salvage the upper riser pipe assembles and flanged ductile iron piping located above existing grade. Store the upper riser pipe assembles and the flanged ductile iron piping at locations approved by the engineer. Contact Jim Wojcehowicz at (414) 479-8965 to arrange for the pickup of salvaged materials. Install a flange plate flush with existing ground to cap the lower riser pipe assembles. Remove water from the 12-inch riser pipes before capping.

C.2 Backfill
Place ¾-inch clear stone to 1-foot above the water main piping as shown on the plans.

Place Backfill Slurry above the ¾-inch clear stone to 6 inches below surface grade as shown on the plans. Prior to placement of Backfill Slurry, provide for positive drainage of the area to be backfilled. Discharge from the truck in a manner to prevent segregation. Consolidation or compaction effort will not be required. Twelve hours shall elapse before covering the backfill.

C.3 Restoration
Install erosion control devices and restore disturbed areas as directed by the engineer. Erosion control and restoration will be paid for under their standard bid items.

C.4 Traffic Control
Install traffic control devices as directed by the engineer in accordance to the pertinent provisions of section 643.3 of the standard specifications and as hereinafter provided. For the delivery of equipment and materials, place traffic control devices conforming to the standard detail drawings for Traffic Control, Single Lane Closure, Non-Freeway/Expressway; Traffic Control, Intersection within Single Lane Closure; and Traffic Control, Sidewalk Closure. Do not impact traffic on Burleigh Street during peak hours.

C.5 Protecting the Site
Prior to beginning water main work, install items required for the proper protection of persons on the site and members of the pubic including but not limited to barricades, warning signs, and safety fencing.

Excavate for the asphaltic surface temporary and base aggregate dense on which temporary precast concrete barrier will be placed as shown on the plans. Delivery and installation of the temporary precast concrete barrier will be paid for under their standard bid items.

After the portable generator has been removed and work on the Burleigh Water Booster Station has been satisfactorily completed and approved by the engineer, remove all items required to protect the site.

C.6 Remove, Salvage and Transport Pumps
Carefully disassemble, remove, salvage and transport pumps along with skid, control panel, valves, flow meter, gauges, piping, assemblies, and all appurtenances to Wauwatosa Department of Public Works Yard, 11100 West Walnut Road, Wauwatosa, WI after construction and or as directed by the engineer. Provide three day notice to Jim Wojcehowicz of Wauwatosa at (414) 479-8965 prior to transporting equipments. Do not damage the 12-foot by 10-foot concrete pad and will be left in place for a future use.

D Measurement
The department will measure Burleigh Water Booster Station as a pump system assembly acceptably furnished and operated as shown on the plans.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.5002	Burleigh Water Booster Station	LS

Payment for Burleigh Water Booster Station is full compensation for contacting the City of Wauwatosa; for setting up and attending a preconstruction meeting with the City of Wauwatosa; for all excavating and disposal of removed materials including existing conduits; for installing riser pipes; for capping the lower riser pipe assembles; disassembling, removing, salvaging and transporting pumps along with skid, control panel, valves, flow meter, gauges, piping, assemblies, and all appurtenances to Wauwatosa Department of Public Works Yard; for furnishing and installing all fittings, valves, valves boxes, flanges, tees, risers, bends, ductile iron pipe, concrete thrust blocks, sample ports, pressure gauges, and concrete pads; for bolting and securing the pump skid; for furnishing, running, maintaining and removing a portable generator; for designing, furnishing, installing, running, and maintaining temporary booster station; for providing a heated air enclosure; for all safe water and pressure testing; for collecting water samples, testing, and submitting water sample reports to the City of Wauwatosa; for adjusting the existing PRV; for testing the temporary booster pump system for a one week trial run; for all dewatering; for furnishing, maintaining and removing a portable restroom facility; for constructing concrete pad, furnishing and placing ¾-inch clear stone and Backfill Slurry; for providing shop drawings, operation and maintenance manuals; for providing all training; for furnishing, installing, maintaining and removing all traffic control devices required to complete this work; for furnishing, installing and removing items required for the proper protection of the site including but not limited to barricades, warning signs, and safety fencing; and for furnishing all labor, tools, equipment and incidentals necessary to complete the work in accordance to the contract.

390. Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP Pilot, Item SPV.0165.4710.

Replace entire language under **B.3.1 General** with the following:

B.3.1 General

The walls shall have modular precast concrete face panels produced by a wet cast process, and have cast-in-place concrete pads or footings. The concrete panels shall have a minimum strength of 4000 psi at 28 days. The concrete for the panels shall be air entrained, with an air content of 6% +/- 1.5%. All materials for the concrete mixture for the panels shall meet the requirements of Section 501 of the WisDOT Standard Specifications for Highway and Structure Construction. The panel edges shall be configured so as to conceal the joints. The detail shall be a shiplap, tongue and groove or other detail adequate to prevent vandalism or ultraviolet light damage to the backside of the wall joint covering. Joints between panels shall be no more than 0.75 inch. Use full wall height slip joints at points of differential settlement when detailed on the plan. Horizontal joints must be provided with a compressible bearing material to prevent concrete to concrete contact.

A minimum of two bearing pads shall be used per panel. The allowable bearing stress shall not exceed 900 psi. The bearing pads shall be preformed EPDM rubber conforming to ASTM D-2000, Grade 2, Type A, Class A with a minimum Durometer Hardness of 80, or high- density polyethylene pads with a minimum density of 0.034 lb/in^3 in accordance to ASTM 1505.

An 18-inch wide geotextile shall be used on the backface of the wall panels to cover all panel joints. The geotextile shall meet the physical requirements stated in standard spec 645.2.4 for Geotextile Fabric, Type DF, Schedule B, except that the grab tensile strength shall be a minimum of 180 pounds in both the machine and cross-machine directions. The geotextile shall be attached with a standard construction adhesive suitable for use on concrete surfaces and cold temperatures. The adhesive shall be applied to the panels, not to the geotextile.

When Alternate Wall Backfill Type B (Coarse Aggregate No.1) is used in the reinforced zone as backfill, as required for construction during freezing weather, a geotextile shall be placed to separate the Alternate Wall Backfill Type B from the retained soil. If the wall is constructed in stages where

portions of wall backfill consist of Wall Backfill Type A and adjacent portions consist of Alternate Wall Backfill Type B (Coarse Aggregate No.1), a geotextile must also be placed at the interface of and between the two different backfill materials for the entire height of the backfill to prevent migration of finer soil. The geotextile shall also be placed on top of the Alternate Wall Backfill Type B to provide separation from the fill above the wall reinforced zone. Adjoining sections of geotextile should be overlapped by a minimum of 12 in. The geotextile shall meet the physical requirements stated in standard spec 645.2.4 for Geotextile Fabric, Type DF, Schedule B. Where geotextile is used it cannot be placed directly on top of wall reinforcement and it must be placed at one-half of the backfill lift thickness over the reinforcement.

Do not alternate wall backfill types along the height of the wall. Sloping of the Alternate Wall Backfill Type B from the top of the reinforced earth zone down to the leveling pad is acceptable as required for staging and as approved by the engineer. The section C.2 compaction requirements must be satisfied for this interim condition. Temporary shoring return walls, such as wire face MSE walls, are acceptable as approved by the engineer.

All steel portions of the wall system exposed to earth shall be galvanized. All soil reinforcement and attachment devices shall be carefully inspected to ensure they are true size and free from defects that may impair the strength and durability.

For cast in place sections of cap and coping, use poured concrete masonry Grade A, A-FA, A-S, A-T, A-IS or A-IP concrete conforming to standard specification standard spec 501 as modified in standard specification standard spec 716. Provide QMP for cast in place cap and coping concrete as specified in standard specification standard spec 716, Class II Concrete.

Use a wall leveling pad that consists of poured concrete masonry, Grade A, A-FA, A-S, A-T, A-IS or A-IP concrete conforming to standard specification standard spec 501 as modified in standard specification standard spec 716. Provide QMP for leveling pad concrete as specified in standard specification standard spec 716, Class III Concrete.

The minimum embedment to the top of the leveling pad shall be 1 foot 6 inches or as given on the plan or given in AASHTO LRFD 11.10.2.2 whichever is greater. Step the leveling pad to follow the general slope of the ground line. The leveling pad's steps shall keep the bottom of the wall within one half the panel heights of the minimum embedment i.e. the minimum embedment plus up to one half the height of one panel. Additional embedment may be detailed by the contractor, but will not be measured for payment.

Replace the first paragraph under **B.3.2 Backfill** with the following:

Furnish and place backfill for mechanically stabilized earth concrete panel walls as shown on the plans and as hereinafter provided. The same backfill material must be used for the entire wall height, from the leveling pad to top of finished reinforced earth zone, for each stage of wall construction. For the purposes of this special provision, a stage is defined as constructing a full-height portion of wall along the wall alignment, not staging wall construction up the height of the wall. Horizontal changes in backfill strata up the height of the wall will not be allowed.

Replace entire language under **E Payment** with the following:

E Payment

The department will pay for plan quantities according to the Pay Plan Quantity article at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.4710	Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP Pilot	SF

Payment is full compensation for supplying a design and shop drawings; preparing the site, including all necessary excavation and disposal of materials; supplying all necessary wall components to produce a functional system including cap and copings; constructing the retaining system including drainage system; providing backfill (Type A or Type B), backfilling, compacting, developing/completing/documenting the quality management program, performing compaction testing/observation. Parapets, railings, abutment bodies and other items above the wall cap or coping will be paid for separately. Vehicle barrier and its support will be paid separately. Any temporary return walls, such as a wire face MSE wall, required to facilitate construction of a portion of wall with Backfill Type B is incidental to this bid item.

Any required topsoil, fertilizer, seeding or sodding and mulch will be paid for at the contract unit price of topsoil, fertilizer, seeding or sodding and mulch, respectively.

412. Notice to Contractor – WDNR Forestry Staging Area.

General
A construction staging area will be made available for the contractor's potential use beginning in the fall of 2014. Unless otherwise approved in writing by the engineer, contractor use of construction staging area will terminate on May 1, 2016. Use of this staging area is contingent to the requirements of this article.

The site is located at the Wisconsin DNR Forestry Exploration Center Property, located between Underwood Parkway and Swan Boulevard, east of USH 45. The staging area is approximately 5 acres and is accessed off of Swan Boulevard.

Contact Michael Thompson/Wisconsin Department of Natural Resources (414) 303-3408 to arrange for initial access to this site.

Site Plan
Submit detailed proposed use plans for acceptance by the engineer that include the following as a minimum:

- Site preparation
- Location of activities
- Hours of operation for each activity
- Ingress/Egress
- Compliance of Air, Water, Wetland, Waste, Land and Endangered Species regulations including copies of any applicable permits.
- Site maintenance
- Proposed site restoration

Submit written requested amendments to the proposed use plan to the engineer for acceptance, a minimum two weeks in advance of any changes in originally accepted use(s) of the site.

Site plan restrictions
Contaminated material – There is a closed underground storage tank site in the area (DNR Bureau of Remediation and Redevelopment Tracking System (BRRTS) # 03-41-003703, http://dnr.wi.gov/topic/brownfields/rrsm.html. Petroleum contaminated soil may be present immediately beneath the southern half of the west wall of the former Landscape Services Nursery Shed. Gravel may be placed in this area - with no topsoil stripping - to accommodate expanded use. Further coordination will be required if excavation is needed for utilities or other subsurface work. Contact Paul Grittner, DNR Hydrogeologist, (414) 263-8541, Paul.Grittner@Wisconsin.gov, for further information and Nursery Shed survey coordinates.

Upon acceptance of proposed use plan, and prior to use, complete installation of fencing and screening as shown in the plans. Maintain all existing Forestry Staging Area fencing or temporary fencing. At no time leave the site where fencing is inadequate to protect the general public. Post warning signs alerting the public of this site.

Site preparation and clearing and grubbing are the contractor's expense. Do not remove trees without prior written approval from the engineer. Remove all trees cut on the property at the contractor's expense.

If used, the staging area must be included as a selected site in the ECIP for this contract. During use of the site, the contractor is responsible for installing and maintaining proper erosion control devices at the staging area. Protect storm sewer inlets from runoff. Install tracking pads for ingress and egress.

Maintain access to the staging area for emergency response vehicles at all times.

Identify and mark the existing utility facilities. Maintain a 20-foot horizontal clearance zone from all utility poles, towers, manholes, vaults or pedestals. Maintain vertical clearance from all energized utility lines in accordance with current OSHA and/or applicable code requirements. Conduct operations in such a manner as to prevent damage to existing utilities. Notify the utility owner promptly if damage occurs. Repair all damage caused to such utilities resulting from negligence or carelessness on the part of the contractor's operations at contractor expense.

Prior to vacating the site, restore the staging area to the preconstruction site grades and condition as directed by the engineer. All surfaces not planned for future infrastructure will have the materials and equipment needed for construction operations removed, compacted soil plowed, and one foot of topsoil spread on the site and planted with perennial rye grass at the contractor's expense.

Preclude, and/or manage, any use(s) to avoid creating a nuisance. Provide two weeks advance notice to the engineer, in writing, for any night time use.

Through November 30, 2014, this site may also be used to store materials and equipment by department contractor for State Project ID 1060-33-72. Coordinate with others as necessary to provide access to the site for other projects.

Vehicular access to WDNR Forestry staging parcel will be restricted to the gated driveway location along Swan Blvd., or as otherwise identified by the department.

Comply with restrictions and terms identified above. Do not create an adverse impact on adjacent parcels as determined by the engineer. Complete site preparation prior to May 31, 2015. Avoid ground disturbing operations on the site between August 15th and October 15th.

Conduct construction activities in an environmentally sound manner, including the proper disposal of all demolition material that cannot be recycled.

The department maintains the right to further restrict or rescind use of the WDNR Forestry Staging Area if the contractor fails to meet or comply with department restrictions.

413. Abandoning MMSD Sanitary Manhole, Item SPV. 0060.5106.

A Description

This work includes abandoning existing sanitary manholes in place, in accordance to the plans.

B Materials

B.1 General

Furnish Backfill Slurry in accordance to the pertinent requirements of standard spec 209 except as hereinafter modified. Use aggregates that conform to section 501 of the standard specifications for Grade A Concrete. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily.

C Construction

C.1 General

Clean manhole thoroughly. Plug the existing pipe with an 8-inch brick or concrete wall. Remove the walls of the structure to a depth of 3 feet below grade or to the base if directed by the engineer. Fill the excavation with Backfill Slurry, to existing surface or to appropriate depth for pavement restoration. Maintain satisfactory bypass service during these operations.

Salvage all MMSD frames and covers which become the property of the Milwaukee Metropolitan Sewerage District. Contact Linda Resch, with Veolia Water at 414-747-3838 for pick up.

Provide by-pass pumping of wastewater around construction zone during working hours.

During non-work hours, provide temporary connection of replacement sanitary sewer to existing sanitary sewer to provide uninterrupted sanitary sewer service.

D Measurement

The department will measure Abandoning MMSD Sanitary Manhole as a unit for each individual manhole, acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5106	Abandoning MMSD Sanitary Manhole	Each

Payment is full compensation for furnishing and installing all materials; for providing positive drainage of the area to be backfilled; for furnishing and placing Backfill Slurry; for salvaging frames and covers and for disposing of materials.

414. MMSD Sanitary Sewer Manhole 48-Inch Precast Concrete w/ Casting, Item SPV.0060.5109.

A Description

Construct sanitary manholes consisting of pre-cast reinforced concrete, pre-cast concrete adjustment rings, watertight joints, pre-cast concrete base, pre-cast concrete eccentric cone tops, steps, and all excavation and granular backfill in accordance to the plans.

B Materials

Provide sanitary manholes with a minimum 48-inch inside diameter pre-cast concrete barrel sections, with eccentric type cone top section with 24-inch minimum opening, and with an 8-inch thick integral pre-cast concrete base. Provide concrete with a compressive strength of 4000 psi and conforming to ASTM C478. Minimum manhole wall thickness shall be 5 inches. Manholes shall conform to Chapter 8.39.0 of the “SSSW” and construction detail in the plans.

Provide corrosion resistant manhole steps as manufactured by M.A. Industries, Inc. Model PS2-PFS or equal with ½-inch diameter Grade 60 steel reinforcement coated with copolymer polypropylene plastic. Install steps 15-inch on center.

Provide manhole barrel joints with rubber ring gasket material or butyl plastic gasket material. Rubber gaskets shall conform to requirements of ASTM C443. Butyl plastic gasket material shall conform to requirements of ASTM C990 and AASHTO M-198.

Provide concrete adjustment rings with steel reinforcement in conformance with ASTM C-478 and a minimum of 4-inch in thickness. A maximum of 10-inch for adjustment will be allowed. Multiple grade rings will not be allowed where one will suffice.

Castings shall be non-rocking, Type-B self-sealing lid with concealed pick holes. Neenah Foundry component Number 0000-0095 and Neenah Foundary Component No. 0000-1736. Castings shall conform to Chapter 8.48.0 of the "SSSW".

All exterior joints shall be wrapped with Mac-Wrap or approved equal. This shall be considered incidental to the installation of the sanitary sewer manhole.

Provide internal chimney seal made of a rubber-type product, with a minimum thickness of 3/16 inches, a minimum unstretched width of 8 inches and extruded or molded from a high grade rubber compound conforming to the applicable requirements of ASTM C923. Fabricate the bands used for compressing the sleeve against the manhole from stainless steel conforming to ASTM A240, Type 304, for sheet and ASTM A479, Type 304, for rods. Any screws, bolts, or nuts used on these bands are to be stainless steel conforming to ASTM F593 and F594, Type 304. The internal seal or its appurtenances are not to extend far enough into the manhole opening to restrict entry into or exit from the manhole.

Provide sanitary sewer pipe to pre-cast manhole wall connection with flexible, watertight boot or cast- in seal. Boots shall have stainless steel clamps and stainless steel hardware. Seal shall be Press-Seal PSX or pre-approved equal.

Perform a vacuum test on each new sanitary manhole as part of this contract in accordance with section 3.7.3 of the "SSSW".

C Construction

Excavate to provide a smooth, compacted flat bottom. Place a minimum 6-inch depth of bedding material conforming to the requirements of the "SSSW" and compact prior to setting manhole base and riser section.

Construct concrete bench in the interior bottom of the sanitary manhole which are precast or poured-in-place. The bench shall extend to the top of the pipe. Construct the bench invert to provide a smooth flow line and conform to the curvature of the pipe.

Install external manhole joint seal on all manhole barrel section joints in addition to joint gasket seal.

Final rim elevations shall be ¼" to ½" below final grade in asphalt pavement and at final grade in concrete pavement and in grass. Adjustment rings shall not exceed 7.5 inches.

Verify depth and location of existing MMSD sewer at new manhole location. Contractor to provide concrete encasement, steel reinforcement, and bentonite waterstops required to complete connections to existing pipe and structures.

Salvage all MMSD frames and covers which become the property of the Milwaukee Metropolitan Sewerage District. Contact Linda Resch, with Veolia Water at 414-747-3838 for pick up.

D Measurement

The department will measure MMSD Sanitary Sewer Manhole, 48-Inch, Precast Concrete with Casting as each individual manhole, acceptably completed.

E Payment
The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5109	MMSD Sanitary Sewer Manhole 48-Inch Precast Concrete w/ Casting	Each

Payment is full compensation for furnishing and installing all materials including pre-cast manhole base, riser, bench, cone section, frames, grates or lids, and chimney adjustment rings; for installing gaskets, joint seals, steps, bedding material, granular backfill material; for furnishing all excavation, dewatering, sheathing and shoring, forming foundation, and masonry work; for making sanitary sewer connections; for sawcutting, boots, seals, reinforcement, concrete encasement, waterstops, adapters; and for providing PVC and RCP pipe required to make connections, for backfilling including mechanical compaction and compaction testing; for removing sheeting and shoring; for disposal of all surplus or waste material; and for clean-up. Vacuum Testing will be paid at a separate unit price.

415. MMSD Sanitary Manhole Vacuum Test, Item SPV.0060.5110.

A Description
This special provision describes vacuum testing MMSD sanitary manhole as shown in the plans.

B Materials
Provide vacuum test equipment, meters, gauges, plugs, and other equipment, materials and facilities necessary to make specified tests. Provide bulkheads, blocking, bracing or other temporary sectionalizing devices that may be required.

C Construction
Manholes shall be tested after installation with all connections in place. Test shall include testing of the seal between the frame and the concrete cone, slab or grade rings.

Isolate the manhole to be tested by plugging the inlet and outlet pipes with an inflatable stopper or other approved plug. Plug lift holes with non-shrink grout.

Vacuum test equipment shall be place at the inside top cone section, in accordance to the manufacturers recommendations, Inflate the seal to 40 psi to effect a seal between the base and manhole. Run vacuum pump until a vacuum of 10 inches of mercury is obtained.

With Vacuum pump shut off and the valve on the vacuum line of the test head closed, measure the time for the vacuum to drop to 9 inches of mercury. The manhole test is acceptable if the time exceeds the value as listed in table 6a section 3.7.6 of the “SSSW”.

If a manhole fails the vacuum test, the manhole shall be repaired with a non-shrinkable grout or other material or method approved by MMSD. The manhole surfaces shall be properly prepared prior to any repairs. Once the repair material has cured according to the manufacturer’s recommendations the vacuum test shall be repeated. This process shall continue until a satisfactory test is obtained.

D Measurement
The department will measure Sanitary Manhole Vacuum Testing by the unit, acceptably Tested.

E Payment
The department will pay for measured quantities at the contract price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5110	MMSD Sanitary Manhole Vacuum Test	Each

416. Ductile Iron Water Main 16-Inch Restrained Joint w/ Backfill Slurry, Item SPV.0090.5013.

A Description

This special provision describes the installation of Ductile Iron water main with BCLS backfill, from Station 12BLWM+15.21 to Station 12BLWM+36.71 and Station 15BLWM+11.10 to Station 15BLWM+41.03 outside of future roadway limits and beneath future retaining walls, to the length and elevations as shown on the plans.

A.1 General

Perform work under these items in accordance to the details as shown on the plans and the requirements of the City of Milwaukee Water Main Installation Specifications, dated January 2, 1987 (City Water Main Specifications). Additionally, perform all work in accordance to the "Milwaukee Water Works Standard Plan Notes for Water Main Construction", June 14, 2011. Notes 4, 6, 16 through 18, and 21 shall not apply to this project. In case of conflicts between the City Water Main Specifications and the standard specifications or these special provisions, the requirements of the city standard specifications and the special provisions shall govern. Contact Ms. Angela Baldwin, at (414) 286-2813 to purchase copies of the required documents.

A.2 Submittals

Address all required submittals to Milwaukee Water Works as follows:

Superintendent
Milwaukee Water Works
Zeidler Municipal Building
841 North Broadway, Room 409
Milwaukee, WI 53202

A.3 Sequence of Construction

Due to the nature of this work, including traffic staging and coordination with other work, the contractor is advised there may be multiple mobilizations to complete the water main work. No additional payment will be made by the department for said mobilizations.

Determine sequence and schedule for water main construction, subject to the requirements herein.

Prepare and submit for review by the Superintendent of Milwaukee Water Works a detailed construction schedule stating the anticipated dates and duration of all interruptions in water service necessary to complete the work under the contract, including the abandonment of existing water mains.

B Materials

B.1 General

Furnish all fittings required for installation on this project. Water main shall be Restrained Joint Ductile Iron Thickness Class 55 pipe, conforming to the City of Milwaukee's Material Specifications and AWWA C-151 with fittings conforming to the City of Milwaukee's Material Specifications and AWWA C110.

Material specifications can be found at the following website, http://city.milwaukee.gov/water/business/standardspecs.htm.

All materials will require inspection by the City of Milwaukee. Notify Mr. Mark Scheller, (414) 286-2427 or Mr. Steve Brengosz, (414) 708-2808, for materials inspection and the City of Milwaukee's Construction Section, (414) 286-2497, for construction inspection, four working days prior to starting construction.

Contractor to provide all necessary information for furnished steel and iron items to comply with Wisconsin Department of Transportation DT2249, "Utility's Certificate of Compliance for Steel and Iron Items".

Milwaukee Water Works will test all pipe, in accordance to the City of Milwaukee Material Testing Specifications. Material testing done by the city will remove at least one welded end from a restrained pipe piece. Contractor to provide enough pipe for testing and installation. The department will not pay for additional pipe length used for material testing purposes.

B.2 Fluorocarbon Gaskets
Furnish fluorocarbon gaskets for ductile iron water main within contaminated soil limits from station 15BLWM+11.1 to station 15BLWM+41.03, as shown on plans and as directed by engineer. Fluorocarbon gaskets shall conform to ASTM D-2000, designation 5BG615A14B24.

B.3 Backfill Slurry
Use fine aggregate conforming to section 501.2.5.3 and size number 1 coarse aggregate conforming to section 501.2.4, and water in the Backfill Slurry mix. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily. Submit a mix design for the engineers review prior to placement. Backfill Slurry is considered as mix class III and the department accepts the mix by certification. Mix acceptance and testing in the field is not required.

C Construction
C.1 General
Install fittings as shown on plans, incidental to respective ductile iron water main item. A list of fittings for each water main installation is provided on plans.

Abandon existing water mains as shown on plans unless scheduled for removal in the utility removal plans. All costs for the abandonment of existing water main are to be included in the price for the Ductile Iron Water Main item(s). All costs for the removal of the existing water main are paid under a separate item.

The Milwaukee Water Works will shut off the water main to be altered and provide temporary hose connections to affected services as required.

C.2 Fluorocarbon Gaskets
Install fluorocarbon gaskets for ductile iron water main within contaminated soil limits from station 15BLWM+11.1 to station 15BLWM+41.03, as shown on plans and as directed by engineer. All costs for furnishing and installing the fluorocarbon gaskets are to be included in the price for the water main item.

C.3 Backfill Slurry
Prior to placement of backfill slurry provide for positive drainage of the area to be backfilled. Discharge from the truck in a manner to prevent segregation. Consolidation or compaction effort will not be required. Pumping to remove water from the backfill slurry will help in backfill consolidation. Two hours shall elapse before paving over the backfill.

Material placed within water main trenches is subject to the quality control for the zone that the material is located in and shall conform to QMP Subgrade article listed elsewhere in this special provision document. Non-conforming slurry will be replaced at no additional cost to the Department.

Place backfill slurry at the locations and to the lines and grades as shown on the plan. Backfill slurry will be placed beneath future retaining walls (R-40-556 and R-40-557) through the limits of the water main trench. Any backfill placed above the limits of Backfill Slurry as shown on the plans shall be granular backfill in accordance to the “Milwaukee Water Works Standard Plan Notes for Water Main Construction”.

Due to the nature of this work, including traffic staging and coordination with other work, the contractor is advised that placement of bulkheads may be needed for backfill slurry and granular backfill placement.

Do not place backfill slurry or granular backfill on frozen materials and do not incorporate frozen backfill in the water main trench.

D Measurement

The department will measure Ductile Iron Water Main 16-Inch Restrained Joint w/ Backfill Slurry by the linear foot of water main of the type and diameter specified acceptably completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5013	Ductile Iron Water Main 16-Inch Restrained Joint w/ Backfill Slurry	LF

Payment is full compensation for providing all labor, equipment, materials, gaskets, valve boxes, fittings, and accessories required; for all surveying; excavating, for sheeting and shoring; for forming foundation; for laying pipe; for removing valves; for installing all fittings; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for designing, providing, and placing the backfill slurry material; for providing, and placing granular backfill material, including bedding material; for backfilling and compacting; for removing sheeting and shoring; for cleaning out the site of the work and incidentals necessary to complete the work.

417. Steel Casing w/ Ductile Iron 16-Inch Carrier w/ Backfill Slurry, Item SPV.0090.5014.

A Description

This special provision describes the installation of a steel casing pipe with a Ductile Iron carrier pipe with backfill slurry, from station 12BLWM+36.71 to station 15BLWM+11.10 below existing and future roadway limits, to the length and elevations as shown on the plans.

A.1 General

Perform work under these items in accordance to the details as shown on the plans and the requirements of the City of Milwaukee Water Main Installation Specifications, dated January 2, 1987 (City Water Main Specifications). Additionally, perform all work in accordance to the “Milwaukee Water Works Standard Plan Notes for Water Main Construction”, June 14, 2011. Notes 4, 6, 16 through 18, and 21 shall not apply to this project. In case of conflicts between the City Water Main Specifications and the standard specifications or these special provisions, the requirements of the city standard specifications and the special provisions shall govern. Contact Ms. Angela Baldwin, at (414) 286-2813 to purchase copies of the required documents.

A.2 Submittals

Address all required submittals to Milwaukee Water Works as follows:

Superintendent
Milwaukee Water Works
Zeidler Municipal Building
841 North Broadway, Room 409
Milwaukee, WI 53202

B Materials

B.1 General

Furnish all fittings (restrained joint and standard) required for installation on this project. Water main shall be Restrained Joint Ductile Iron Thickness Class 55 pipe, conforming to the City of Milwaukee's Material Specifications and AWWA C-151. Furnish all fittings conforming to the City of Milwaukee's Material Specifications and AWWA C110.

Material specifications can be found at the following website, http://city.milwaukee.gov/water/business/standardspecs.htm.

All materials will require inspection by the City of Milwaukee. Notify Mr. Mark Scheller, (414) 286-2427 or Mr. Steve Brengosz, (414) 708-2808, for materials inspection and the City of Milwaukee's Construction Section, (414) 286-2497, for construction inspection, four working days prior to starting construction.

Contractor to provide all necessary information for furnished steel and iron items to comply with Wisconsin Department of Transportation DT2249, "Utility's Certificate of Compliance for Steel and Iron Items".

Milwaukee Water Works will test all pipe, including restrained joint pipe, in accordance to the City of Milwaukee Material Testing Specifications. Material testing done by the city will remove at least one welded end from a restrained pipe piece. Provide enough pipe for testing and installation. The department will not pay for additional pipe length used for material testing purposes.

B.2 Steel Casing Pipe

For casing pipe up to and including 24-inch diameter, provide extra strong, seamless carbon steel pipe conforming to ASTM A53, Grade B. For casing pipe over 24-inch diameter, provide extra strong, spiral welded steel pipe conforming to ASTM A139, Grade B. Provide all steel casing pipe fabricated in sections for welded field joints. Steel casing shall have minimum yield strength of 35,000 psi and shall be spiral-welded steel pipe, uncoated, or equal. Steel casing shall have a minimum thickness as specified in the City Water Main Installation Specifications, Drawing No. 34. The casing pipe must have sufficient thickness to withstand both earth loads and live loads imposed from traffic. Provide engineer with manufacturer certification of steel casing pipe, including minimum yield strength, wall thickness, manufacturer, and ASTM Grade and class.

All welds shall be free from embedded scale and slag, and have a tensile strength across the weld not less than that of the thinner of the connected sections. Make all pipe welds watertight. Use butt welds for all shop-welded joints (to be approved by Milwaukee Water Works). Welders shall be certified as specified in AWWA C200 and C206. The use of back-up welding strips or rings for welds will not be permitted. Repair leaks and defects in welds as directed by Milwaukee Water Works.

Install wrap around pull on type boot seals, or approved equal on both ends of the Steel Casing pipe after pipe installation. The seals shall be watertight and the type of seal shall be approved by the engineer before backfilling. Seals shall have a minimum of two type 304 stainless steel bands with worm screws. Boot seals shall be provided by same manufacturer as casing spacers. The east end of the steel casing pipe at station 15BLWM+11 is under an area of contaminated soil and shall require a nitrile (NBR) boot end seal in accordance to ASTM D2000 MBK. In addition to the boot end seal the east end of the steel casing pipe shall have a concrete bulkhead for casing pipe, incidental to respective ductile iron water main item.

B.3 Backfill Slurry

Use fine aggregate conforming to section 501.2.5.3 and size number 1 coarse aggregate conforming to section 501.2.4, and water in the Backfill Slurry mix. Weigh aggregates at a batch plant suitable for batching concrete masonry. Mix and deliver to the project site using a truck mixer. Add enough water to enable the mixture to flow readily. Submit a mix design for the engineers review prior to placement. Backfill Slurry is considered as mix class III and the department accepts the mix by certification. Mix acceptance and testing in the field is not required.

C Construction

C.1 General

Notify engineer and the WisDOT in accordance to permit requirements before commencing casing installation. Provide complete installation at line and grade indicated on Drawings.

Prepare and submit a plan to the engineer for approval for casing installation means and methods. When applicable, submittal shall include detailed information on open cut/trenching size and location, type and size of equipment, means for controlling grade line, lubrication, welding, means for preventing voids, and any information necessary for casing installation.

Ductile Iron carrier pipe shall be centered and restrained using stainless steel factory-fabricated (wood not allowed) spacers in conformance with manufacturer's specifications. Provide spacers at intervals according to manufacturers' specifications with a minimum two spacers for each pipe length. Spacers shall be located within 2' of the end of casing. Design spacers to prevent uplifting of carrier pipe by hydrostatic forces and attach to pipe using stainless steel bands minimum (1 inch) wide. Spacers shall be a minimum 12" wide with a minimum 6 runners per spacer. Shell, risers and spacers shall be type 304 stainless steel or approved equal. Casing spacers shall be provided by same manufacturer as end boot seals.

Store pipes on level ground free of sharp objects which could damage the pipe. Limit the Stacking of the pipe to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition. Where necessary due to ground conditions, store the pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Pipe shall be homogenous throughout and free of voids cracks, inclusions and other defects and shall be uniform in color, density and other physical characteristics.

Plug all open ends of all sections of joined and/or installed pipe (not in service) at night to prevent anything from entering the pipe line or section. The practice of stuffing cloth or paper in the open ends of the pipe will be considered unacceptable.

Prepare and submit a plan to the engineer for approval for insertion of the water main into the casing. Include pullback procedure, ballasting, use of rollers, side booms and side rollers, coating protection, internal cleaning, internal gauging, and purging in the plan.

Store excavated material from open cut/trenching in locations that minimize the interference with operations, minimize environmental damage, and protect adjacent areas from flooding, runoff and sedimentation.

Damage to utilities and the resulting repair, temporary service cost, etc., shall be borne by the contractor. Backfill access pits in accordance to the appropriate specifications.

Properly sheet/shore all excavations in accordance to relevant specifications for trench safety systems. Any damage resulting from improperly shored excavations shall be corrected to the satisfaction of the engineer with no compensation due to the contractor.

The Milwaukee Water Works will shut off the water main to be altered and provide temporary hose connections to affected services as required.

C.2 Backfill Slurry

Prior to placement of backfill slurry provide for positive drainage of the area to be backfilled. Discharge from the truck in a manner to prevent segregation. Consolidation or compaction effort will

not be required. Pumping to remove water from the backfill slurry will help in backfill consolidation. Two hours shall elapse before paving over the backfill.

Material placed within water main trenches is subject to the quality control for the zone that the material is located in and shall conform to QMP Subgrade article listed elsewhere in this special provision document. Non-conforming slurry will be replaced at no additional cost to the Department.

Place backfill slurry at the locations and to the lines and grades as shown on the plan. Backfill slurry will be placed beneath the existing and future roadways through the limits of the water main trench. Any backfill placed above the limits of backfill slurry as shown on the plans shall be granular backfill in accordance to the City of Milwaukee "Milwaukee Water Works Standard Plan Notes for Water Main Construction".

Due to the nature of this work, including traffic staging and coordination with other work, the contractor is advised that placement of bulkheads may be needed for backfill slurry and granular backfill placement.

Do not place backfill slurry or granular backfill on frozen materials and do not incorporate frozen backfill in the water main trench.

D Measurement
The department will measure Steel Casing w/ Ductile Iron Carrier 16-Inch w/ Backfill Slurry by the linear foot of pipe in place measured along the top centerline of the casing acceptably complete.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.5014	Steel Casing w/ Ductile Iron 16-Inch Carrier w/ Backfill Slurry	LF

Payment is full compensation for furnishing all labor, equipment, tools, materials and accessories required; for all surveying; excavating for sheeting and shoring, for laying pipe, for providing and placing the backfill slurry material; for providing and placing granular backfill material, including bedding material; for backfilling and compacting; for sheeting, shoring, bracing; for installing casing pipe, carrier pipe, spacers, end seals, concrete bulkhead for casing pipe, and lubricant work; for installing all valves and fittings; for concrete base, buttresses, and anchors; for bulkheading and abandoning existing water mains; for sealing joints and making connections to new or existing facilities; for backfilling; for dewatering; for removing shoring, sheeting, bracing; for cleaning out the site of the work and incidentals necessary to complete the work and in accordance to the contract.

418. Bentonite Trench Dam, Item SPV.0060.5014.

A Description
This special provision describes the construction of a Bentonite Trench Dam in a water main trench at the locations and dimensions as shown in plans.

B Materials
The material shall be Bentonite in conformance with ASTM D-5890.

C Construction
Bentonite trench dam shall be constructed by means of removable forms supported by backfill material on all sides. The dam shall be constructed at station 15BLWM+36 and 16BLWM+16 at the

locations and dimensions as shown on plans unless directed otherwise by the engineer in the field due to changes in the location, limits, and/or depths of contamination.

D Measurement
The department will measure Bentonite Trench Dam as each individual unit acceptably complete.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5014	Bentonite Trench Dam	Each

Payment is full compensation for furnishing, hauling, and placing all materials; and disposal of excess material; for sheeting, shoring, bracing, formwork; and for all labor, tools, equipment and incidentals necessary to complete the work.

419. Sign Supports Special Mounting, Item SPV.0060.0153.

A Description
This special provision describes installing special sign supports per detail in contract plans to top of wall. Post material shall be in accordance with specification section 634 of the Standard Specifications. Mounting to be in accordance with detail in contract plans, “Sign Supports, Special Mounting”

B (Vacant)

C (Vacant)

D Measurement
The department will measure Sign Supports Special Mounting for each individual special mounting acceptably installed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0153	Sign Supports Special Mounting	Each

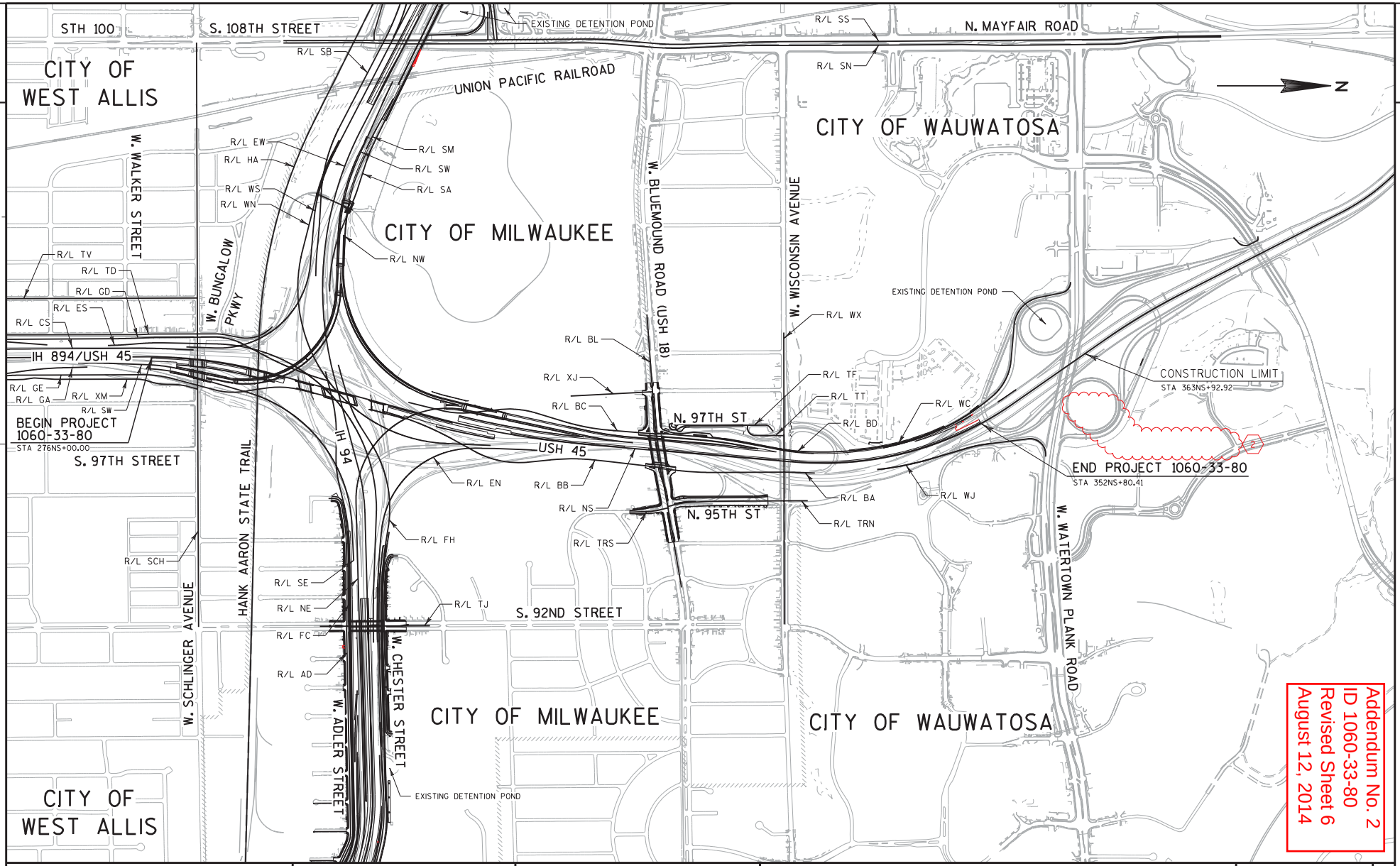
The payment is full compensation providing, hauling, and placing posts; for providing all materials, including hardware and anchors.

Schedule of Items
Attached, dated August 12, 2014, are the revised Schedule of Items Pages 1 – 113.

Plan Sheets
The following 8½ x 11-inch sheets are attached and made part of the plans for this proposal:
Revised: 6, 294, 308, 311, 574, 577, 593, 599, 644, 758, 773, 831, 832, 898, 936,1112 - 1123, 1143,1148, 1151, 1419, 1493, 1495 - 1497, 1500, 1501,1504 - 1506, 1511, 1540 - 1544, 1547, 1556, 1560, 1583, 1652, 1653, 1655, 1659 - 1661, 1663, 1664, 1666 - 1669, 1693, 1694, 1702, 1703, 1756, 1774 - 1790, 1856 - 1860, 1861 - 1865, 1881, 3406, 3418, 3419, 3499 and 3561.

Added: 761A, 761B, 774A, 774B, 1412A, 1428A, 1860A and 1865A.

END OF ADDENDUM

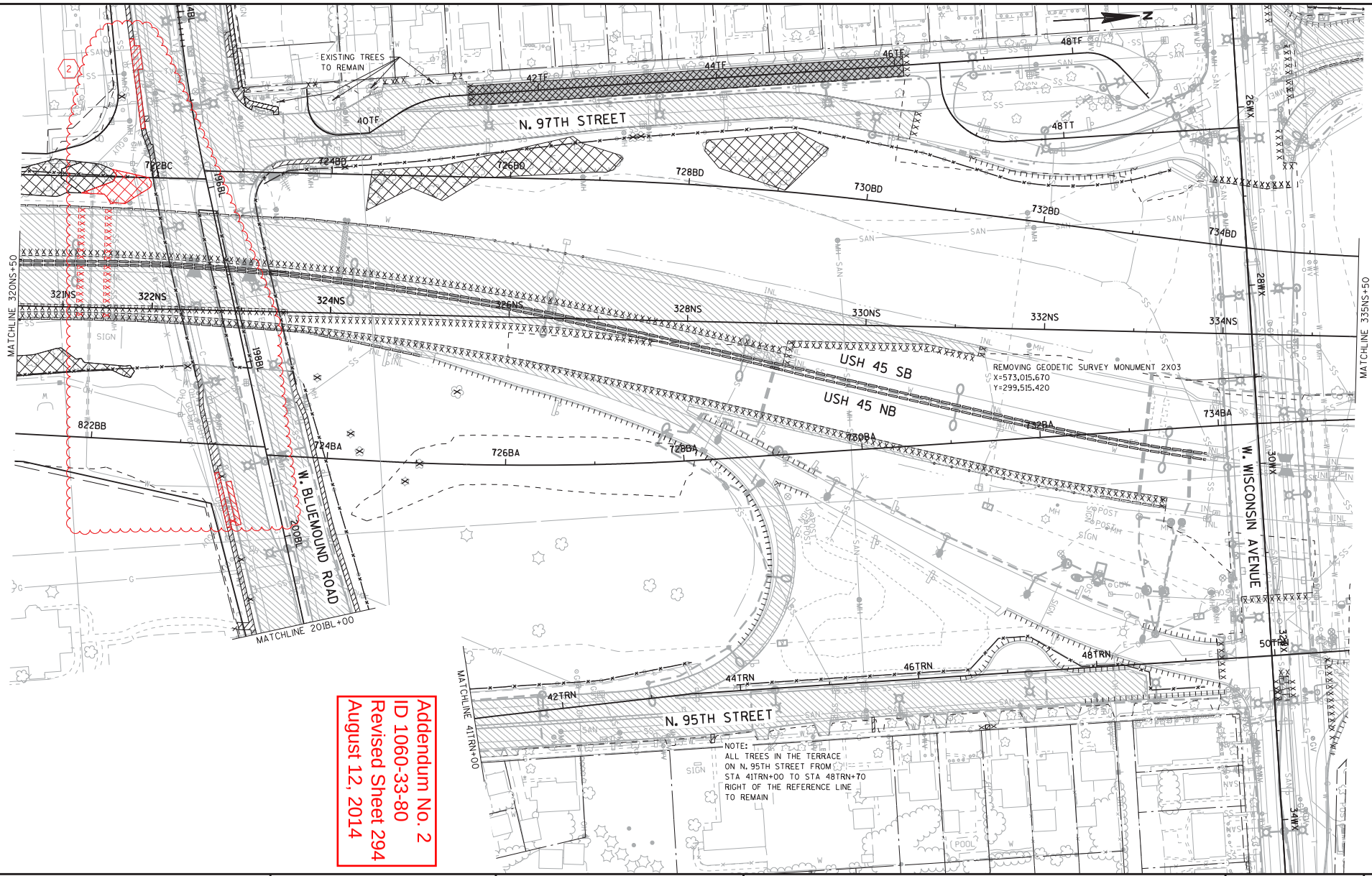


Addendum No. 2
ID 1060-33-80
Revised Sheet 6
August 12, 2014

PROJECT NO: 1060-33-80	HWY: USH 45/IH 94/IH 894	COUNTY: MILWAUKEE	PROJECT OVERVIEW	SHEET 6	E

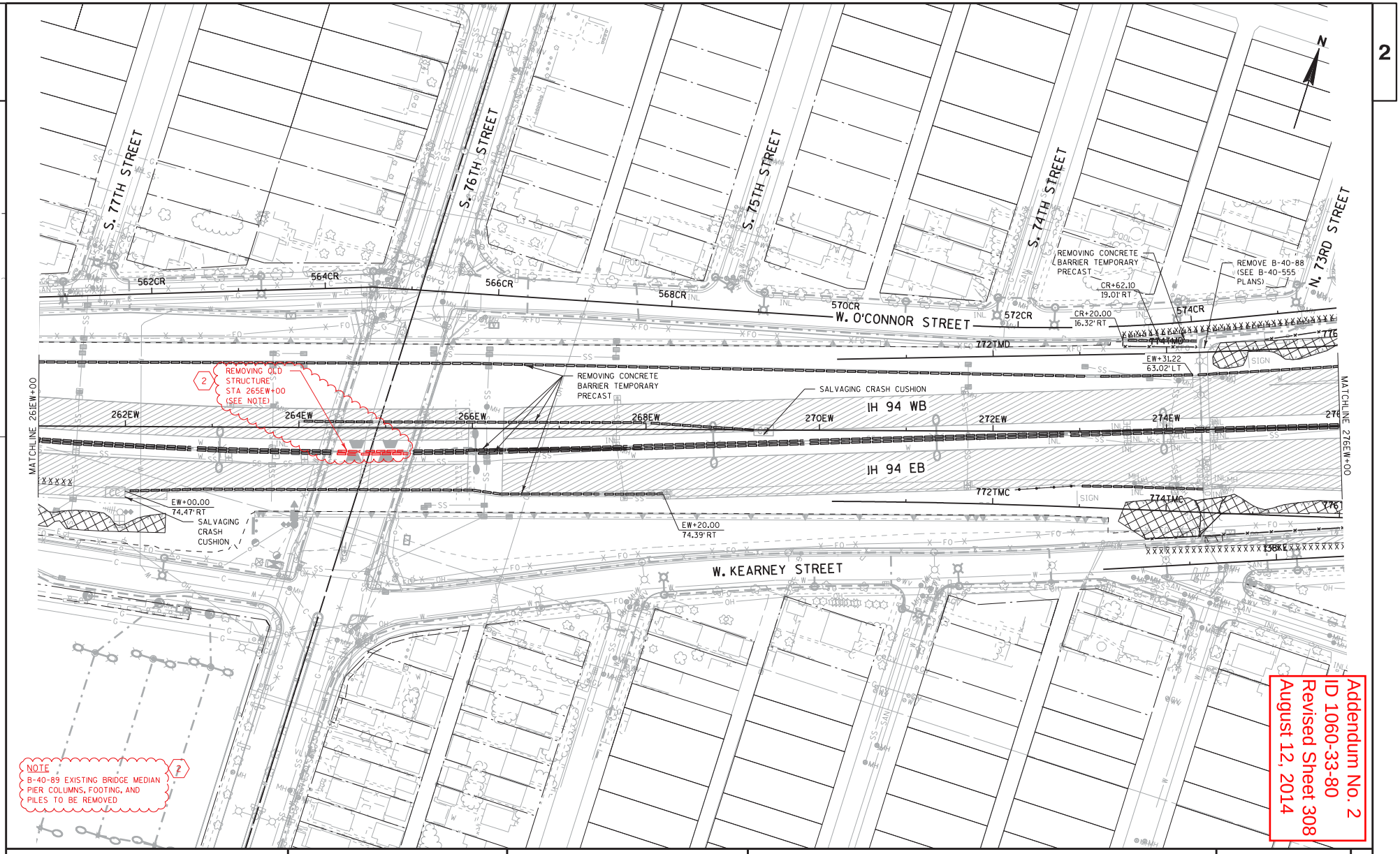
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WISDOT/CADDS SHEET 42



PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	REMOVAL PLANS	SHEET 294	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\021110_rm.dgn PLOT DATE : 07-AUG-2014 14:35 PLOT BY : MSCDYB PLOT NAME : 021110_rm PLOT SCALE : 100:1

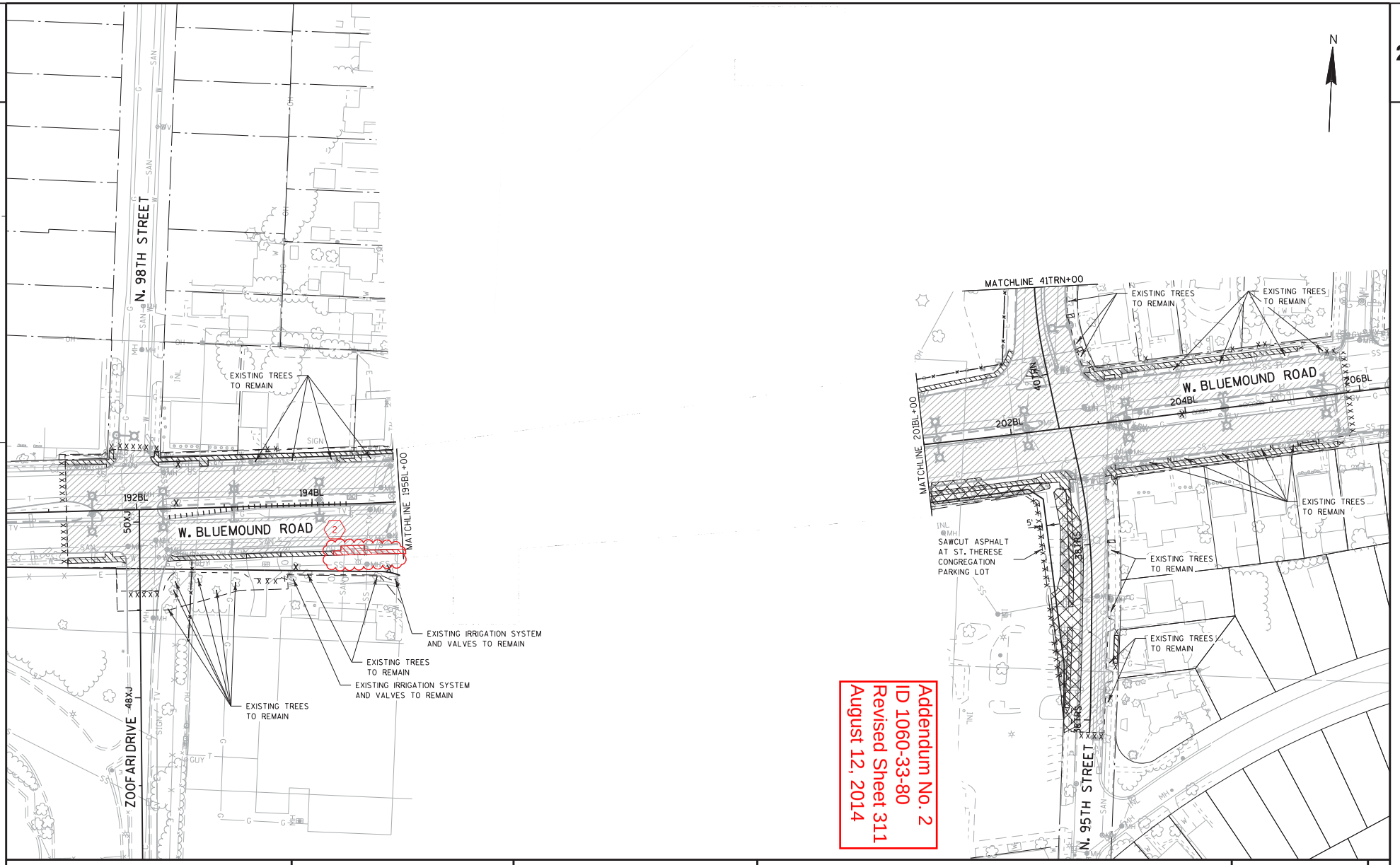


Addendum No. 2
ID 1060-33-80
Revised Sheet 308
August 12, 2014

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	REMOVAL PLANS	SHEET 308	E

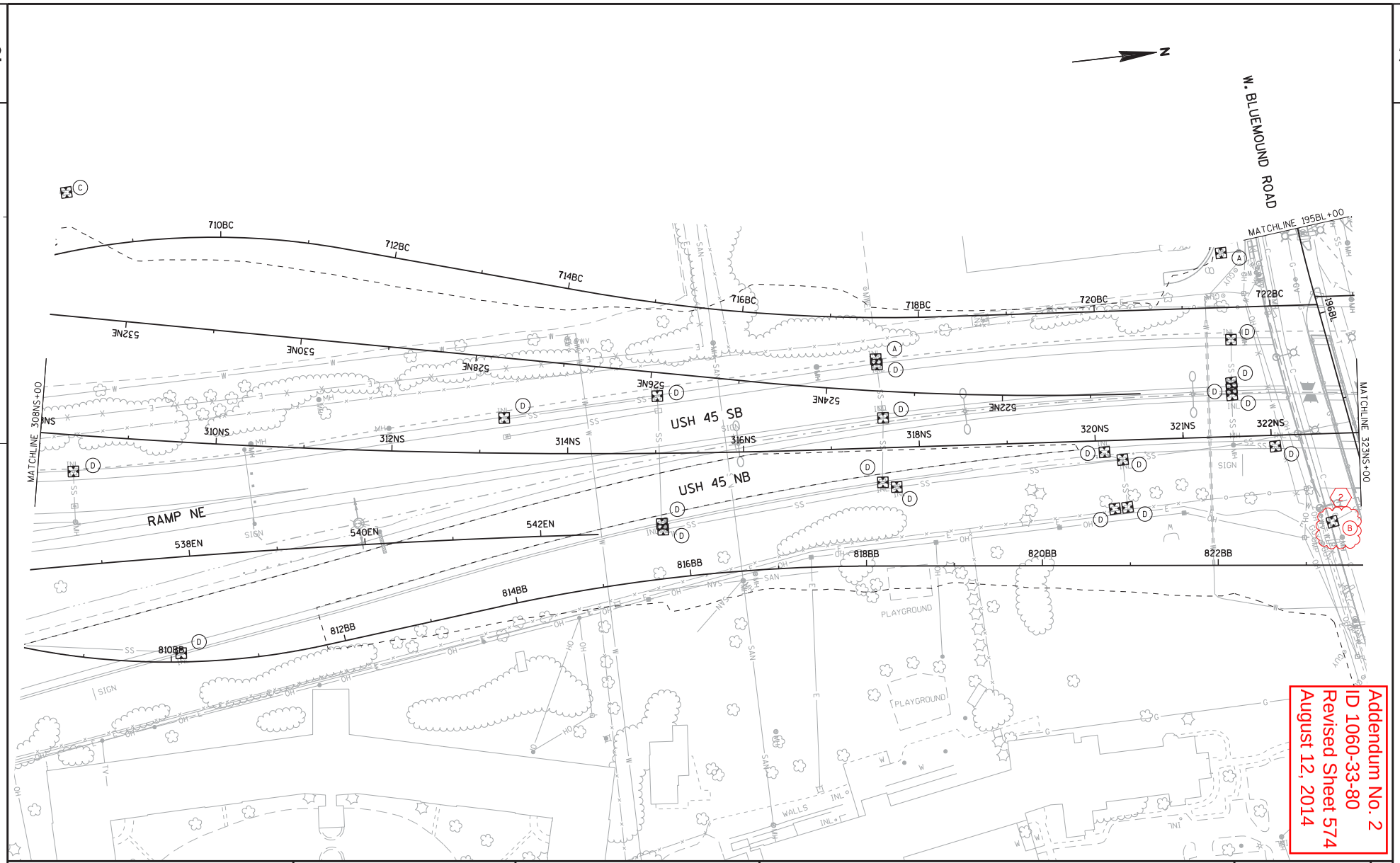
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WISDOT/CADDS SHEET 42



PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	REMOVAL PLANS	SHEET 311	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\021128_rm.dgn PLOT DATE : 07-AUG-2014 12:01 PLOT BY : MSCDYB PLOT NAME : 021128_rm PLOT SCALE : 100:1

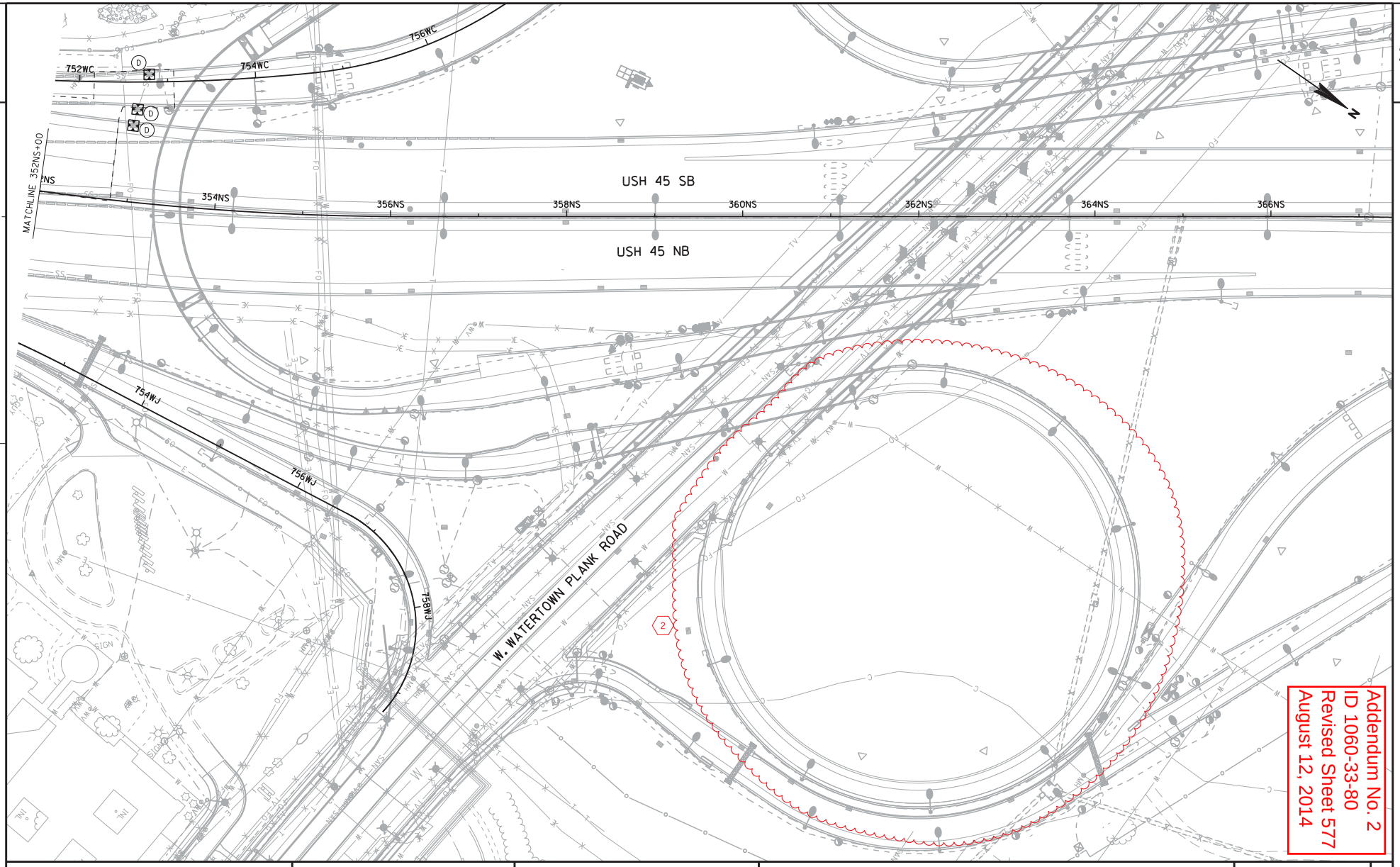


Addendum No. 2
ID 1060-33-80
Revised Sheet 574
August 12, 2014

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	EROSION CONTROL - EXISTING CONDITION	SHEET 574	E

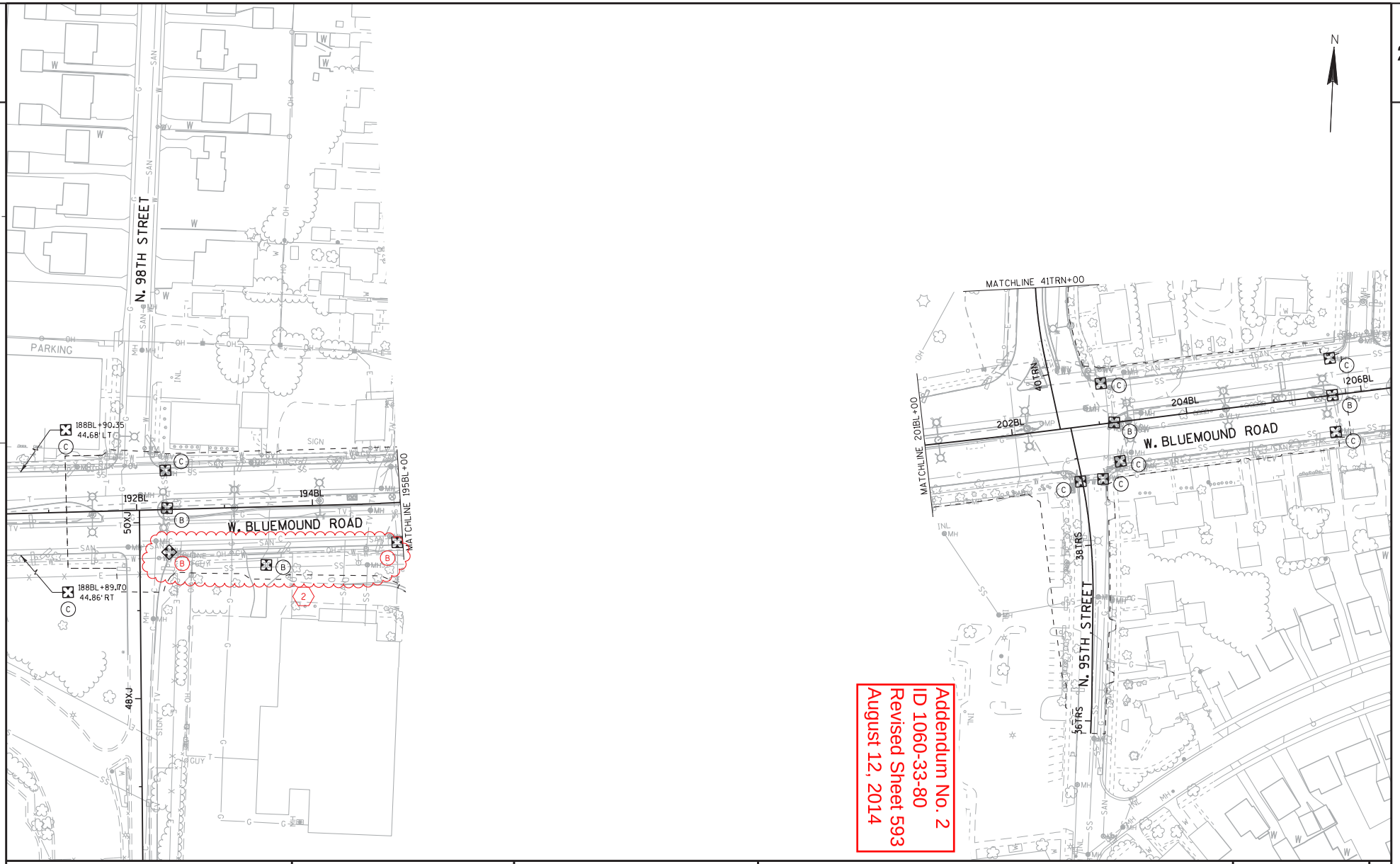
FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\022009_ec.dgn PLOT DATE : 06-AUG-2014 17:34 PLOT BY : MSCK1S PLOT NAME : 022009_ec PLOT SCALE : 100:1

WISDOT/CADDS SHEET 42



PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	EROSION CONTROL - EXISTING CONDITION	SHEET 577	E

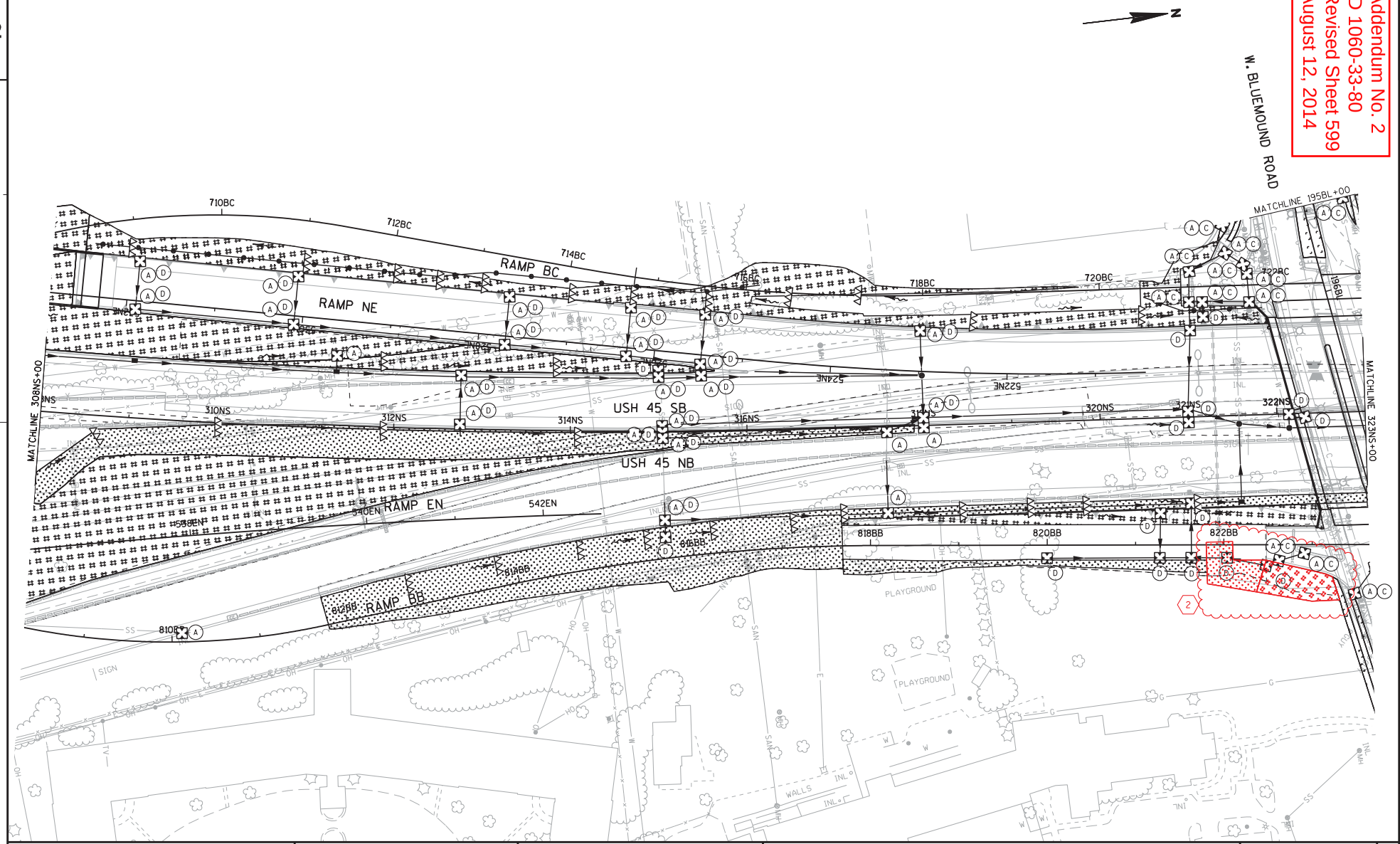
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PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	EROSION CONTROL - EXISTING CONDITION	SHEET 593	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\022035_ec.dgn PLOT DATE : 06-AUG-2014 17:38 PLOT BY : MSCK1S PLOT NAME : 022035_ec PLOT SCALE : 100:1

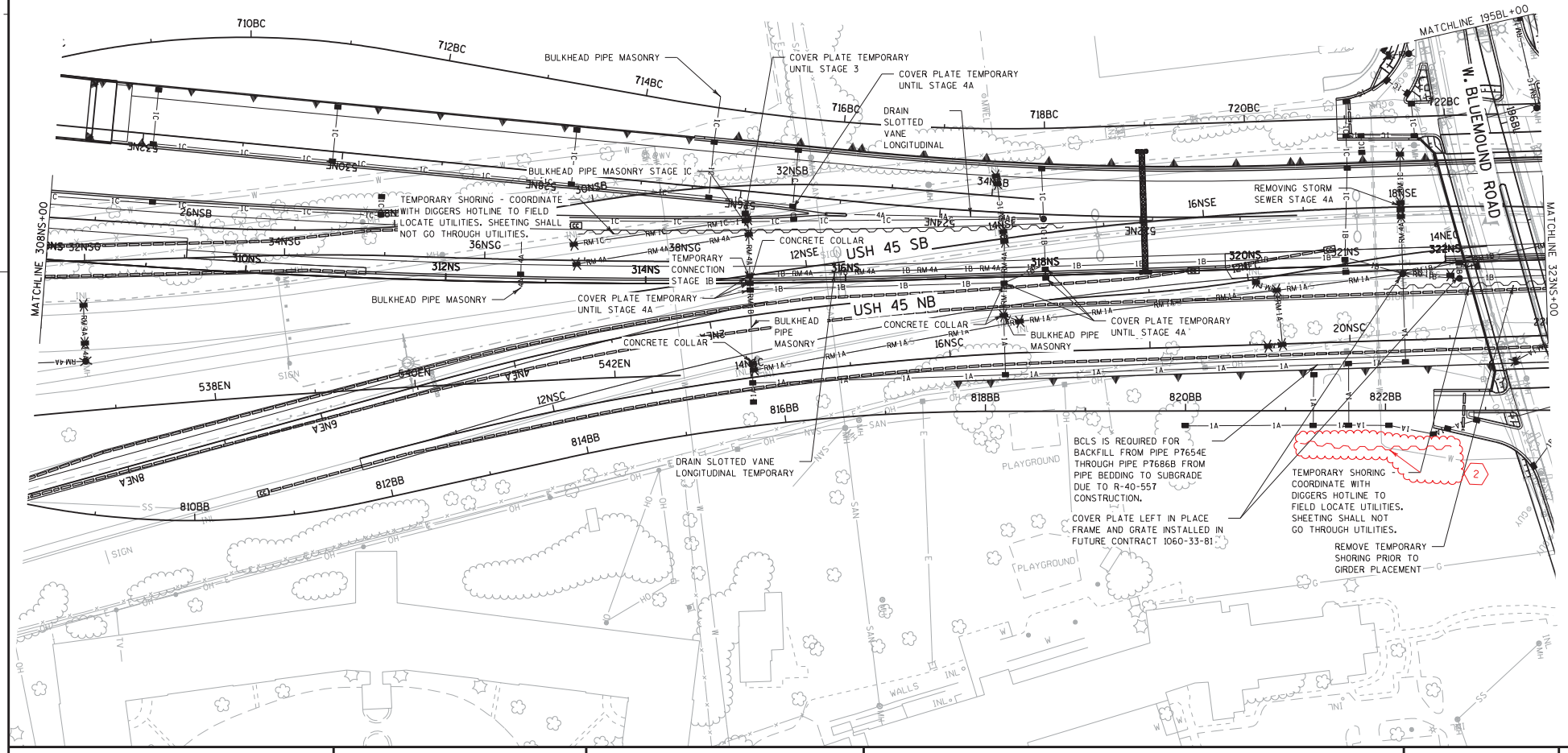
Addendum No. 2
ID 1060-33-80
Revised Sheet 599
August 12, 2014



PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	EROSION CONTROL	SHEET 599	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\022058_ec.dgn PLOT DATE : 06-AUG-2014 17:39 PLOT BY : MSCK1S PLOT NAME : 022058_ec PLOT SCALE : 100:1

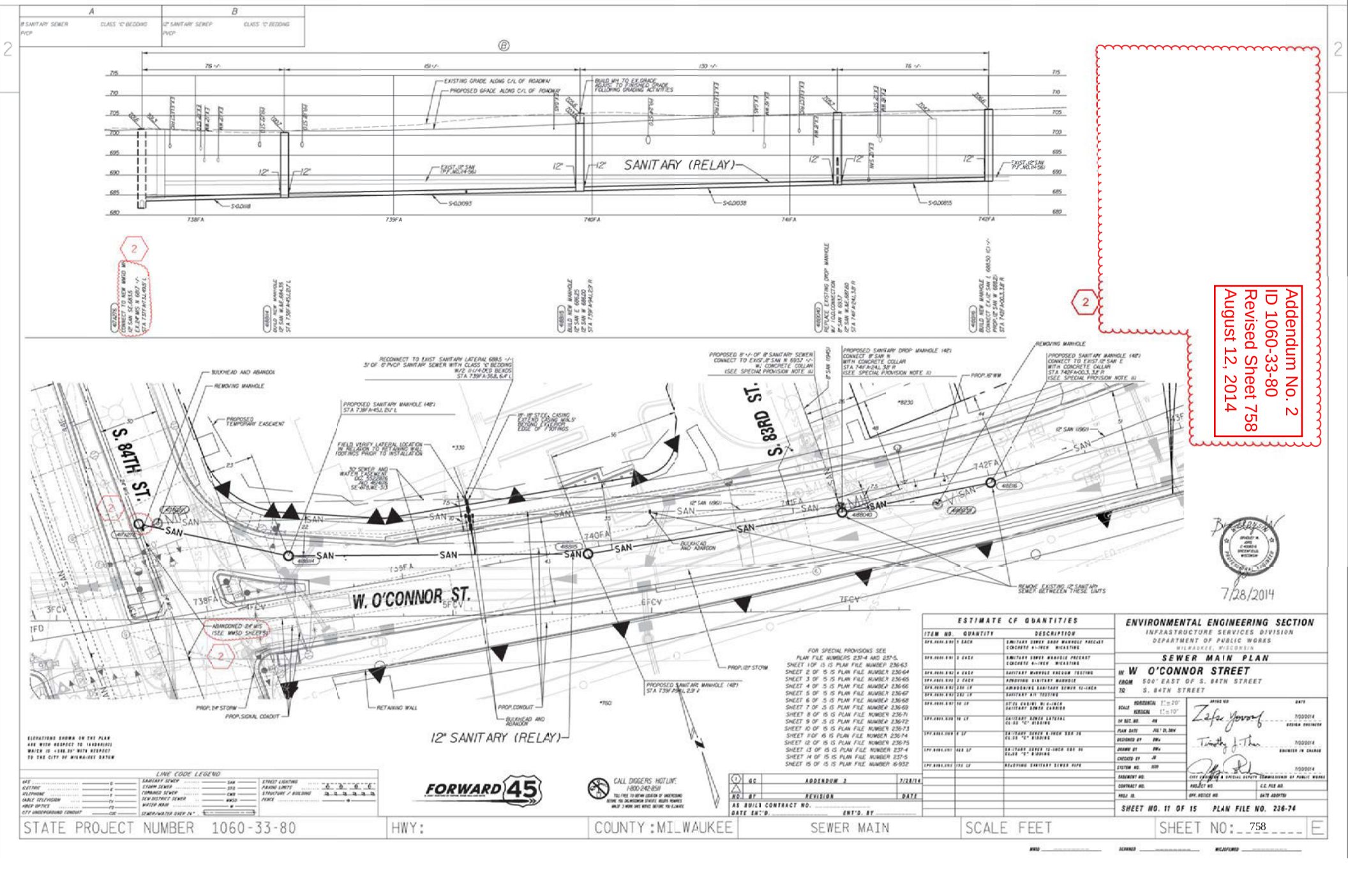
Addendum No. 2
ID 1060-33-80
Revised Sheet 644
August 12, 2014



PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	STORM SEWER - STAGING	SHEET 644	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\022405_ss.dgn PLOT DATE : 07-AUG-2014 08:43 PLOT BY : MSCDYB PLOT NAME : 022405_ss PLOT SCALE : 100:1

WISDOT/CADDS SHEET 42



Addendum No. 2
ID 1060-33-80
Revised Sheet 758
August 12, 2014

7/28/2014

ESTIMATE OF QUANTITIES		
ITEM NO.	QUANTITY	DESCRIPTION
SPV.0605.0701	1 EACH	SANITARY SEWER DROP MANHOLE PRECAST CONCRETE 4'-INCH DIAMETER
SPV.0605.0761	3 EACH	SANITARY SEWER MANHOLE PRECAST CONCRETE 4'-INCH DIAMETER
SPV.0605.0762	4 EACH	SANITARY MANHOLE VACUUM TESTING
SPV.0605.0763	2 EACH	ABANDONING SANITARY MANHOLE
SPV.0605.0764	250 LF	ABANDONING SANITARY SEWER 12-INCH
SPV.0605.0765	592 LF	SANITARY AIR TESTING
SPV.0605.0767	50 LF	STEEL CASING 36'-INCH SANITARY SEWER CARRIER
SPV.0605.0768	16 LF	SANITARY SEWER LATERAL CLASS "C" BEDDING
SPV.0605.0769	8 LF	SANITARY SEWER 8'-INCH SDR 35 CLASS "C" BEDDING
SPV.0605.0770	468 LF	SANITARY SEWER 12-INCH SDR 35 CLASS "C" BEDDING
SPV.0605.0771	755 LF	ABANDONING SANITARY SEWER PIPE

FOR SPECIAL PROVISIONS SEE PLAN FILE NUMBERS 237-4 AND 237-5.
SHEET 1 OF 15 IS PLAN FILE NUMBER 236-63
SHEET 2 OF 15 IS PLAN FILE NUMBER 236-64
SHEET 3 OF 15 IS PLAN FILE NUMBER 236-65
SHEET 4 OF 15 IS PLAN FILE NUMBER 236-66
SHEET 5 OF 15 IS PLAN FILE NUMBER 236-67
SHEET 6 OF 15 IS PLAN FILE NUMBER 236-68
SHEET 7 OF 15 IS PLAN FILE NUMBER 236-69
SHEET 8 OF 15 IS PLAN FILE NUMBER 236-71
SHEET 9 OF 15 IS PLAN FILE NUMBER 236-72
SHEET 10 OF 15 IS PLAN FILE NUMBER 236-73
SHEET 11 OF 15 IS PLAN FILE NUMBER 236-74
SHEET 12 OF 15 IS PLAN FILE NUMBER 236-75
SHEET 13 OF 15 IS PLAN FILE NUMBER 237-4
SHEET 14 OF 15 IS PLAN FILE NUMBER 237-5
SHEET 15 OF 15 IS PLAN FILE NUMBER 16-932

LINE CODE LEGEND

FORWARD 45

CALL DIGGERS HOTLINE 1-800-242-8511

NO.	BY	REVISION	DATE
1	GC	ADDENDUM 2	7/28/14

AS BUILT CONTRACT NO. _____ DATE EN'D. _____ ENT'D. BY _____

ENVIRONMENTAL ENGINEERING SECTION
INFRASTRUCTURE SERVICES DIVISION
DEPARTMENT OF PUBLIC WORKS
MILWAUKEE, WISCONSIN

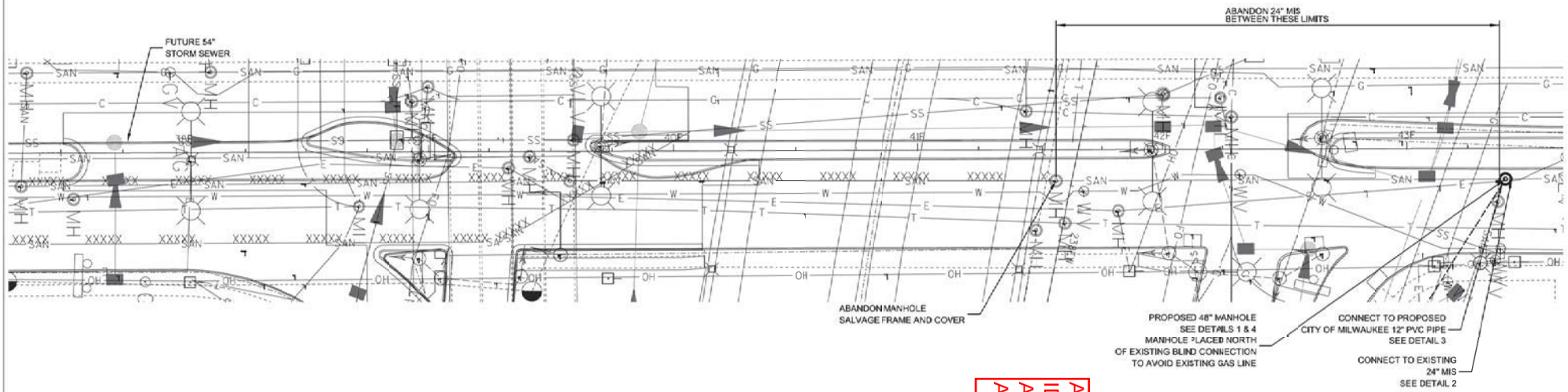
SEWER MAIN PLAN
IN W O'CONNOR STREET
FROM 500' EAST OF S. 84TH STREET
TO S. 84TH STREET

SCALE HORIZONTAL 1"=20' VERTICAL 1"=10'
SHEET NO. 418
PLAN DATE JULY 31, 2014
DESIGNED BY BWA
DRAWN BY BWA
CHECKED BY JR
SYSTEM NO. 0339
EASEMENT NO.
CONTRACT NO.
MSLS NO.

APPROVED DATE
7/28/2014 DESIGN ENGINEER
7/28/2014 ENGINEER IN CHARGE
7/28/2014 CITY ENGINEER & SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
PROJECT NO. C.C. FILE NO.
OFF. NOTICE NO. DATE ADOPTED

SHEET NO. 11 OF 15 PLAN FILE NO. 236-74

STATE PROJECT NUMBER 1060-33-80 | HWY: | COUNTY: MILWAUKEE | SEWER MAIN | SCALE FEET | SHEET NO: 758 E



Addendum No. 2
ID 1060-33-80
Added Sheet 761A
August 12, 2014

HORIZONTAL SCALE: 1" = 40'

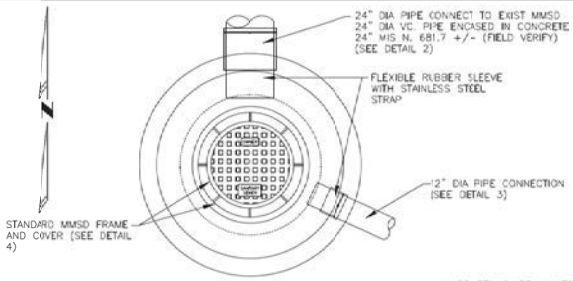
1.) CONTACT LINDA RESCH WITH VIOLIA WATER FOR SALVAGED FRAME AND CASTING PICK UP (414-747-3838)

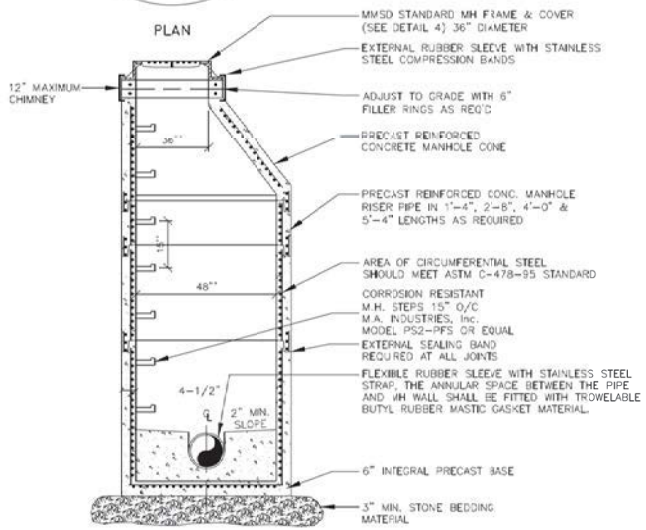
2.) ABANDONED MMSD SANITARY SEWER PER STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR SANITARY SEWER SECTION 3.2.2.4

7/28/2014

REUSE OF DOCUMENTS	VERIFY SCALES	DSGN	This Design Prepared For MMSD By:	REV. NO.	DATE	REVISION DESCRIPTION	BY	APVD	MILWAUKEE METROPOLITAN SEWERAGE DISTRICT	DRAWING NO.:
THIS DOCUMENT AND THE IDEAS AND DESIGNS INCORPORATED HEREIN IS AN INSTRUMENT OF PROFESSIONAL SERVICE AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF THE MILWAUKEE METROPOLITAN SEWERAGE DISTRICT.	BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	G. CALHOUN	FORWARD 45							SHEET:
		DR G. CALHOUN								DATE: JULY, 2014
		CHK								CONTRACT: 1060-33-80
		APVD								MMSD FILE:

MMSD PARTNERS FOR A CLEANER ENVIRONMENT





SANITARY MANHOLE NOTES:

1.) PRECAST CONCRETE ADJUSTING RINGS TO BE REINFORCED WITH ONE HOOP OF STEEL CENTERED WITHIN THE RING WHERE NECESSARY. RINGS SHALL BE GROOVED TO RECEIVE STEP.

2.) CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO DESIGNATION C-478 REQUIREMENTS OF ASTM SPECIFICATIONS.

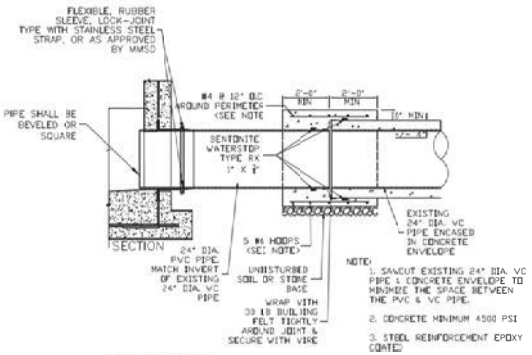
3.) JOINTS SHALL BE WATERTIGHT AND SHALL BE MADE USING RUBBER GASKETS OR BUTYL RUBBER MASTIC MATERIAL.

4.) 3" MIN. BEDDING MATERIAL REQUIRED UNDER MANHOLE BASE AND BACKFILLED STRUCTURE WITH GRANULAR BACKFILL MATERIAL.

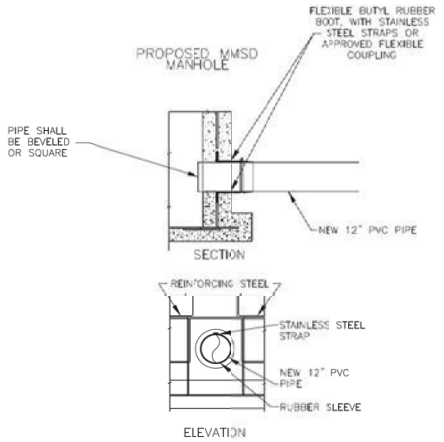
5.) SEE STANDARD SPECIFICATIONS, FILE NO. 12 FOR PRECAST MANHOLE AND FILE NO. 13 FOR MANHOLE INVERTS, INCLUDING INVERTS OF LATERAL SEWERS THAT CONNECT DIRECTLY TO MANHOLES.

7/28/2014

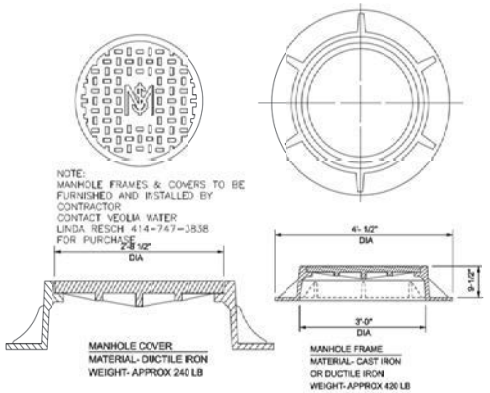
1 SANITARY MANHOLE DETAIL
N.T.S.



2 MMSD SEWER CONNECTION DETAIL
N.T.S.



3 MILWAUKEE CONNECTION DETAIL
N.T.S.

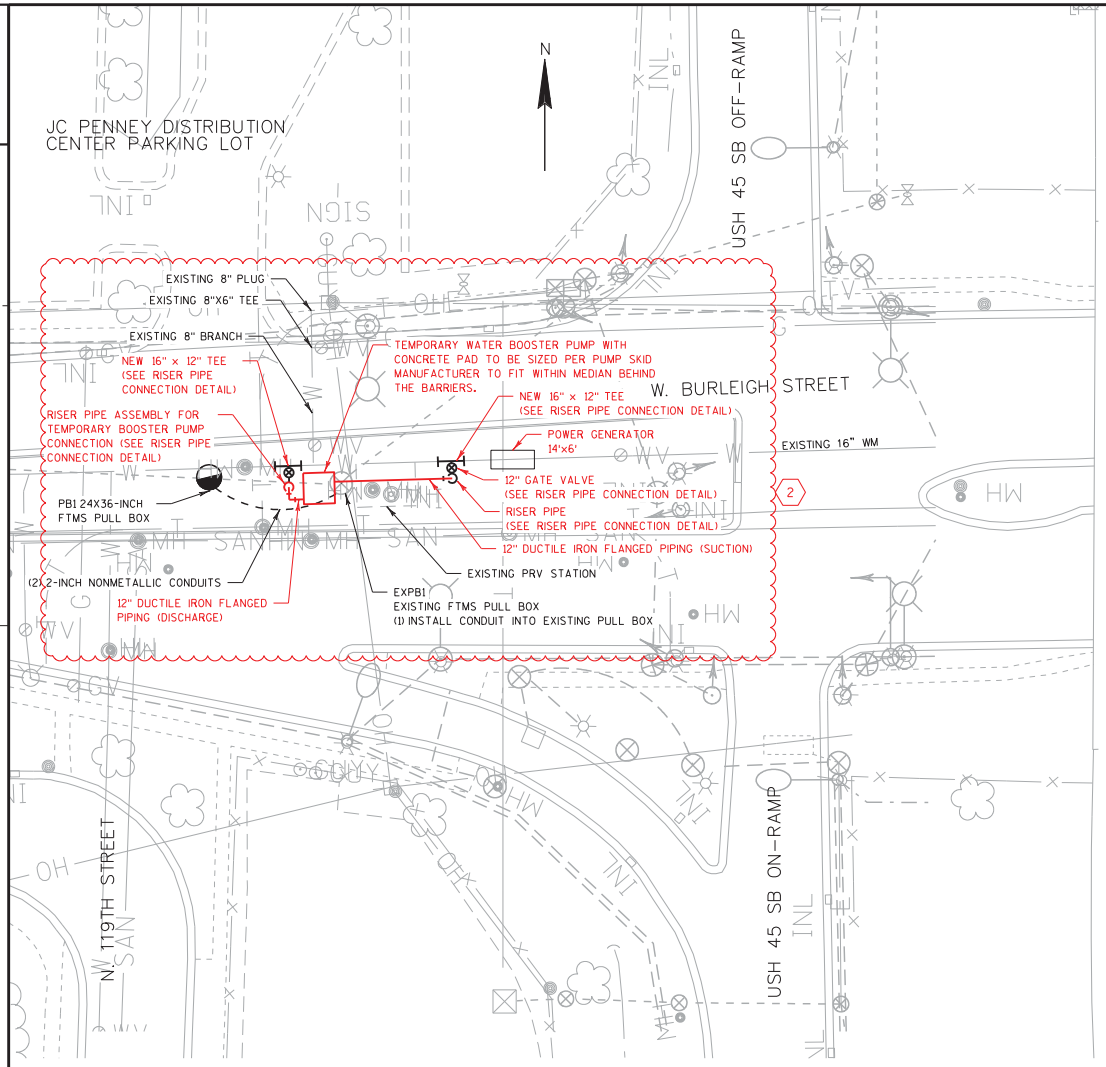


4 MMSD STANDARD MANHOLE FRAME AND COVER
N.T.S.

Addendum No. 2
ID 1060-33-80
Added Sheet 761B
August 12, 2014

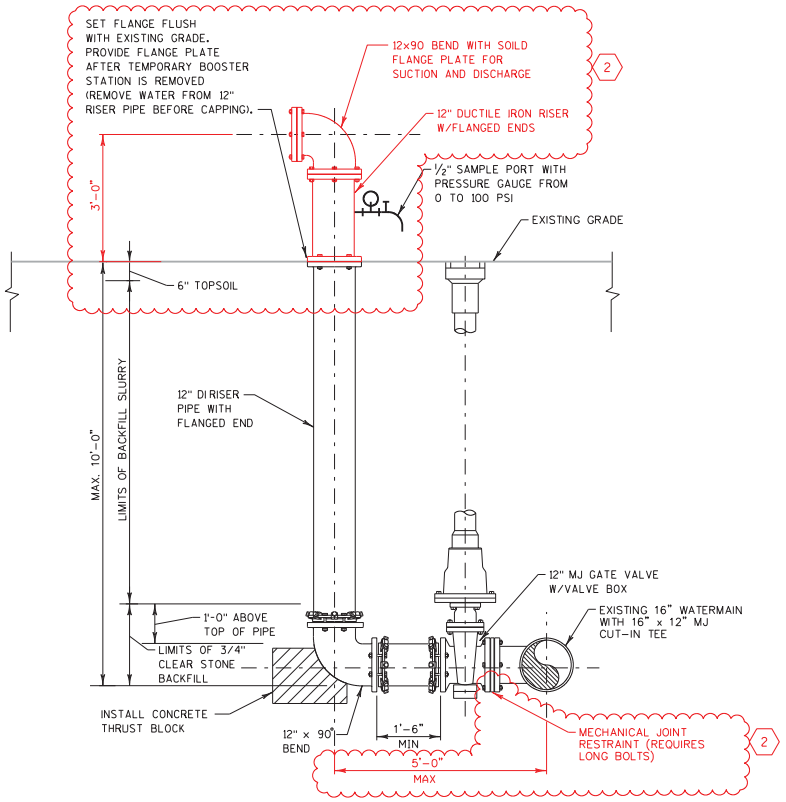
REUSE OF DOCUMENTS: THIS DOCUMENT AND THE IDEAS AND DESIGNS INCORPORATED HEREIN IS AN INSTRUMENT OF PROFESSIONAL SERVICE AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF THE MILWAUKEE METROPOLITAN SEWERAGE DISTRICT.	VERIFY SCALES: BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	DSGN G. CALHOUN DR G. CALHOUN CHK APVD	This Design Prepared For MMSD By: FORWARD 45	REV. NO.	DATE	REVISION DESCRIPTION	BY	APVD	MMSD PARTNERS FOR A CLEANER ENVIRONMENT	MILWAUKEE METROPOLITAN SEWERAGE DISTRICT	DRAWING NO.: SHEET: DATE: JULY, 2014 CONTRACT: 1060-33-80 MMSD FILE:

761B



BURLEIGH WATER BOOSTER STATION

SCALE: 1" = 40'



RISER PIPE CONNECTION DETAIL

SCALE: NTS

NOTES:

1. MEGA LUGS ARE REQUIRED FOR ALL CONNECTIONS (NOT REQUIRED AT ANCHOR TEE).
2. BACKFILL MATERIAL: 3/4" CLEAR STONE TO 1' ABOVE PIPING AND BACKFILL SLURRY TO 6" BELOW SURFACE GRADE.
3. AFTER HARD PIPING CONNECTIONS ARE COMPLETE, THE SYSTEM SHALL BE FLUSHED AND PRESSURE TESTED TO 150 PSI. THE CONTRACTOR MUST HAVE TWO SAFE WATER SAMPLES 24 HRS APART BEFORE THE BOOSTER PUMP SYSTEM CAN BE PUT INTO SERVICE.
4. SEE FOLLOWING SHEET FOR PROTECTION OF THE SITE AND TRAFFIC CONTROL CONSTRUCTION DETAIL FOR ADDITIONAL INFORMATION.

Addendum No. 2
ID 1060-33-80
Revised Sheet 773
August 12, 2014

PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	BURLEIGH WATER BOOSTER STATION	SHEET 773	E

STATE PROJECT NUMBER	SHEET NO.
1060-33-80	

Addendum No. 2
ID 1060-33-80
Added Sheet 774A
August 12, 2014

ESTIMATE OF QUANTITIES

FURNISH PIPE AND INSTALL

(DUCTILE IRON PUSH-ON RUBBER GASKET JOINT) (SPV.0090.5002)
12 FT. - 6" HYDRANT BRANCH

(DUCTILE IRON PUSH-ON RUBBER GASKET JOINT) (SPV.0090.5007)
198 FT. - 16" WATER MAIN

INSTALL (FURNISHED BY CITY)

1-HYDRANT 8.0 (SPV.0060.5001)

FURNISH AND INSTALL

1 - 6" VALVE
1 - 16" B.F. VALVE (MJ)

WATER MAIN ABANDOMENTS

1 - HYDRANT / MINOR (SPV.0060.5000)
1 - VALVE ABANDONMENT
565 FT. - 16" WATER MAIN

FITTINGS SHOWN ON THIS CONSTRUCTION PLAN THAT WILL BE FURNISHED BY CONTRACTOR

1 - AT 16X6
3 - B16-11 1/4
1 - V6
1 - BFV 16
2 - VB-DD
3 - B16-45
1 - B16-22 1/2
2 - VALVE BOX 24" EXT.
1 - SL16 (OP)
1 - C16 (TEMP)
1 - 2" AV (TEMP)
1 - H 48.01 (HYDRANT FURNISHED BY CITY)

GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF MILWAUKEE "WATER MAIN INSTALLATION SPECIFICATIONS", DATED JANUARY 3, 1967. ADDITIONALLY, ALL WORK SHALL BE DONE IN ACCORDANCE WITH "THE MILWAUKEE WATER WORKS STANDARD PLAN NOTES REGARDING WATER MAIN CONSTRUCTION" WHICH ARE ATTACHED AND MADE A PART OF THESE WATER MAIN PLANS AND CONTRACT DOCUMENTS. NOTES 4, 6, 16 THROUGH 18, AND 21 SHALL NOT APPLY TO THIS PROJECT.

THE CONTRACTOR SHALL FURNISH ALL ITEMS REQUIRED TO COMPLETE THIS PROJECT, EXCEPT HYDRANTS FURNISHED BY CITY.

ALL MATERIALS WILL REQUIRE INSPECTION BY THE CITY.

NOTIFY MR. STEVE BRENOSZ AT 414-708-2808 OR MR. MARK SCHELLER AT 414-286-3427, FOR MATERIALS INSPECTION AND THE CITY OF MILWAUKEE'S CONSTRUCTION SECTION AT 414-286-2497, FOR INSTALLATION INSPECTION, FOUR DAYS PRIOR TO STARTING CONSTRUCTION.

THE MILWAUKEE WATER WORKS WILL SHUT OFF THE WATER MAIN TO BE ALTERED AND PROVIDE TEMPORARY HOSE CONNECTIONS TO AFFECTED SERVICES AS REQUIRED. PLEASE CONTACT MR. STEVEN CIANCIOLA OF THE CONSTRUCTION SECTION AT 414-286-3887, THREE (3) DAYS PRIOR, TO SCHEDULE THE NECESSARY SHUT-OFFS AND/OR CONNECTIONS.

ELEVATION NOTE

ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO NAVD 1988(2001). TO CONVERT TO CITY OF MILWAUKEE DATUM, SUBTRACT 580.25 FROM ELEVATIONS SHOWN.

MILWAUKEE WATER WORKS COORDINATION

THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING MR. JAY LLOYD, (414) 708-5012, ONE MONTH PRIOR TO MAKING WET CONNECTION(S) AT BOTH LOCATIONS ON W. BLUEMOUND ROAD. THE INITIAL CONTACT WITH MR. LLOYD IS TO PROVIDE HIM INFORMATION OF THE CONTRACTOR'S PLANNED TIMING.

ANOTHER NOTIFICATION IS REQUIRED 10 WORKING DAYS PRIOR TO EITHER WET CONNECTION TO CONFIRM THE SCHEDULE.

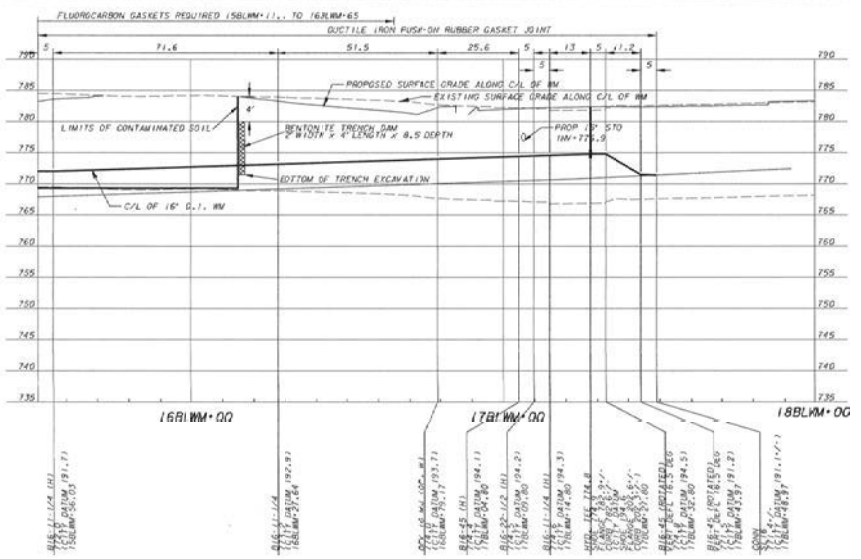
CITY OF MILWAUKEE RESIDENT / BUSINESS NOTIFICATION

WITHIN TEN (10) BUSINESS DAYS OF THE AWARD OF THIS CONTRACT, THE CONTRACTOR SHALL MAIL A NOTICE OF THE WATER MAIN PROJECT TO THE CITY OF MILWAUKEE CONSTRUCTION SECTION (CONTACT: 414-286-3497) AT 841 N. BROADWAY, ROOM 710, MILWAUKEE, WI 53202 FOR REVIEW AND APPROVAL.

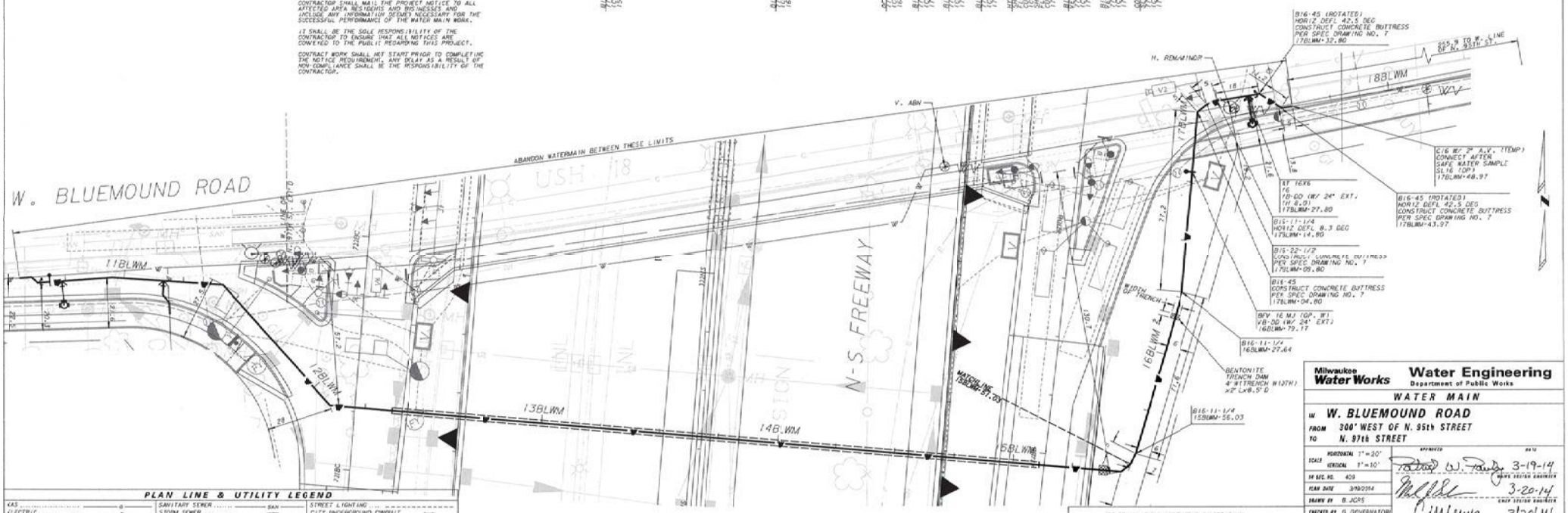
WITHIN FIVE (5) BUSINESS DAYS OF APPROVAL, THE CONTRACTOR SHALL MAIL THE PROJECT NOTICE TO ALL AFFECTED AREA RESIDENTS AND BUSINESSES AND INCLUDE ANY INFORMATION DEEMED NECESSARY FOR THE SUCCESSFUL PERFORMANCE OF THE WATER MAIN WORK.

IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL NOTICES ARE CONVEYED TO THE PUBLIC REGARDING THIS PROJECT.

CONTRACT WORK SHALL NOT START PRIOR TO COMPLETING THE NOTICE REQUIREMENT. ANY DELAY AS A RESULT OF NON-COMPLIANCE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



NOTE: CONTRACTOR TO VERIFY CONNECT POINT LOCATIONS, ELEVATIONS, AND SLOPES. REPORT ANY DISCREPANCIES TO ENGINEER.



PLAN LINE & UTILITY LEGEND

GAS — G — SANITARY SEWER — SAN
ELECTRIC — E — STORM SEWER — STO
TELEPHONE — T — COMBINED SEWER — CMB
CABLE TELEVISION — TV — WATER MAIN — W
FIBER OPTICS — FO — WATER SERVICE
PROPOSED UTILITY — PRESSURE DISTRICT
STREET LIGHTING — DUC
CITY UNDERGROUND CONDUIT
PROPOSED CURB / PVMT
PAVING LIMITS — X X X X
STRUCTURE / BUILDING
FENCE

POWER POLES ○-CONCRETE □-ALUMINUM ◇-WOOD
WATER MAIN VALVES —|—GATE —|—BUTTERFLY ○-W SERVICE
UTILITIES ⊞-TRAFFIC SIGNAL ⊠-TRAFFIC CONTROL BOX ⊙-GAS VALVE
HYDRANTS ⊙-1 NOZZLE ⊙-3 NOZZLE

CALL DIGGERS HOTLINE
1-800-242-8511
TOLL FREE TO OBTAIN LOCATION OF UNDERGROUND UTILITIES BEFORE YOU DIG, WISCONSIN STATUTE 182.0175 REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE

FORWARD 45

STATE MUNICIPAL AGREEMENT COVERS ONLY CONTRACTOR CONSTRUCTION COSTS: WT4101405O2

NO.	BY	REVISION	DATE
2	BWJ	ADDENDUM 2	8/2014

Milwaukee Water Works — Water Engineering, Department of Public Works

WATER MAIN

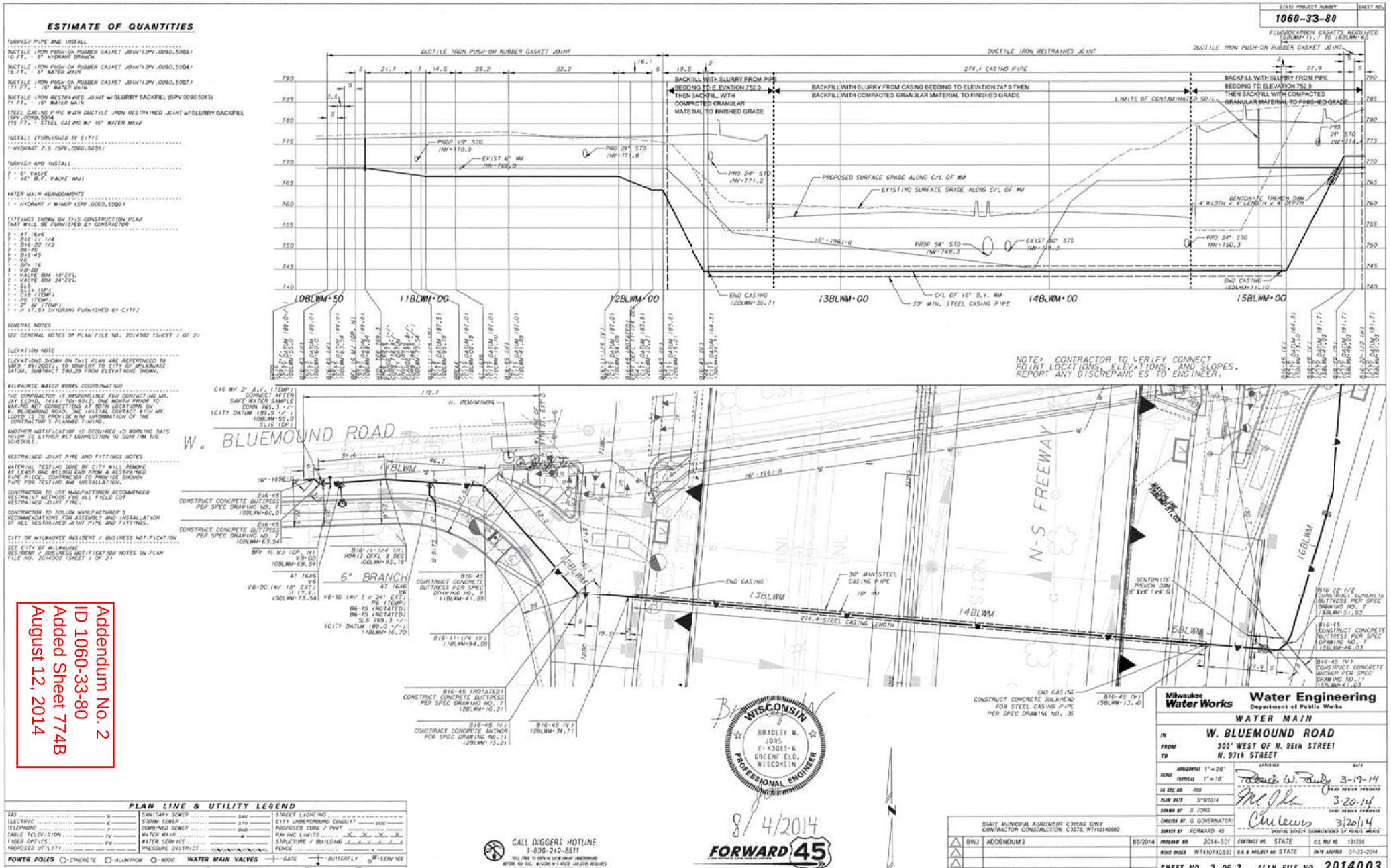
W. BLUEMOUND ROAD
FROM 300' WEST OF N. 95th STREET
TO N. 97th STREET

SCALE	HORIZONTAL 1"=20' VERTICAL 1"=10'
W.S.P.C. NO.	409
PLAN DATE	3/19/2014
DRAWN BY	B. JORS
CHECKED BY	G. GOVERNATORI
SURVEY BY	FORWARD 45
PROGRAM NO.	2014-501
WORK ORDER	WT4101405O1
CONTRACT NO.	STATE
O.R.B. PROJECT NO.	STATE
C.C. FILE NO.	131236
DATE ADOPTED	01-22-2014

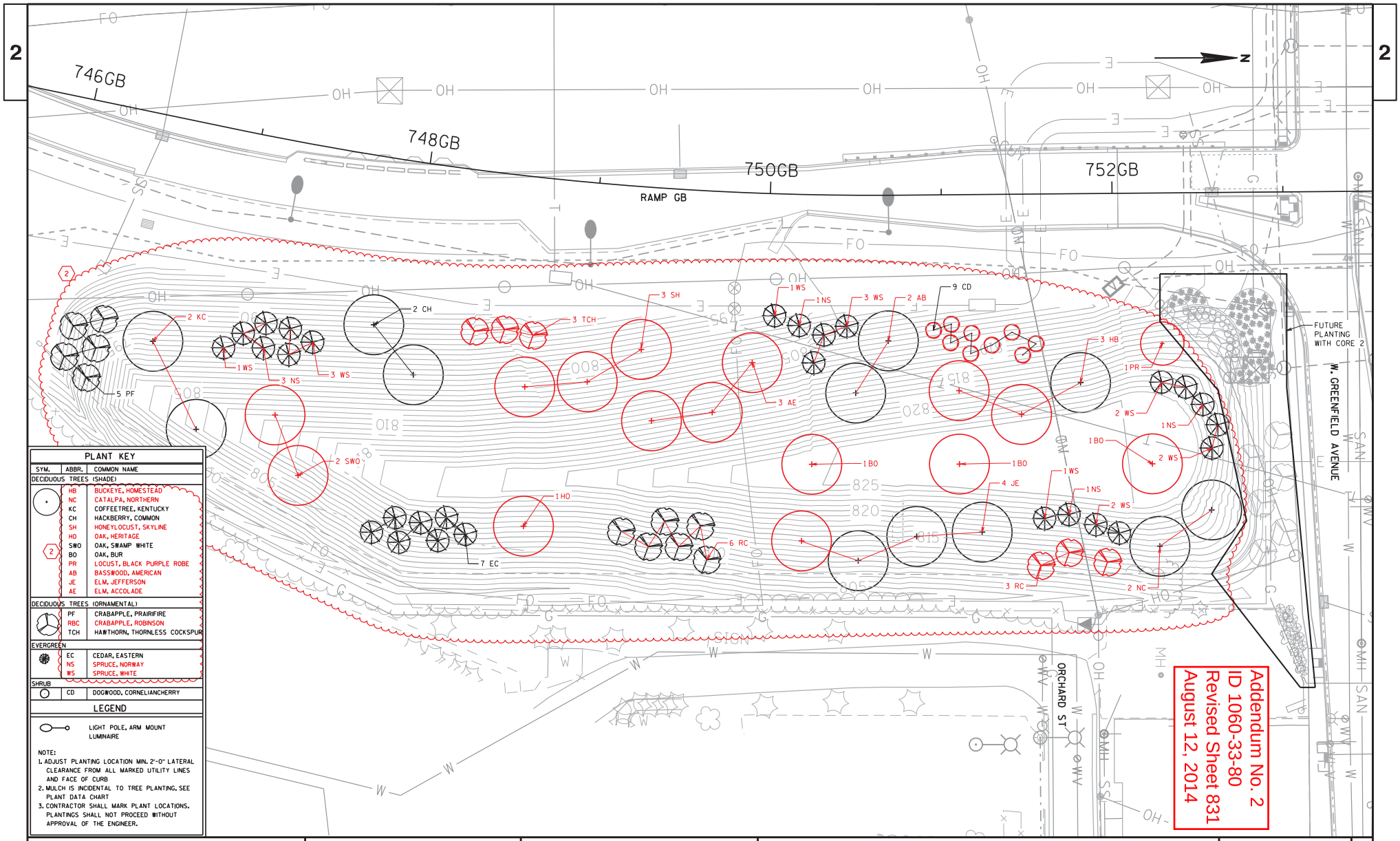
APPROVED — DATE
Robert W. Peters 3-19-14 — MAWW DESIGN ENGINEER
3-20-14 — CHIEF DESIGN ENGINEER
3/20/14 — SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS

SHEET NO. 1 OF 2 — PLAN FILE NO. 2014002

WISCONSIN — BRADLEY W. JORS — E-43083-6 — GREENFIELD, WISCONSIN — PROFESSIONAL ENGINEER
8/4/2014



Addendum No. 2
ID 1060-33-80
Added Sheet 774B
August 12, 2014



PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	STREETSCAPING PLANS	SHEET 831	E

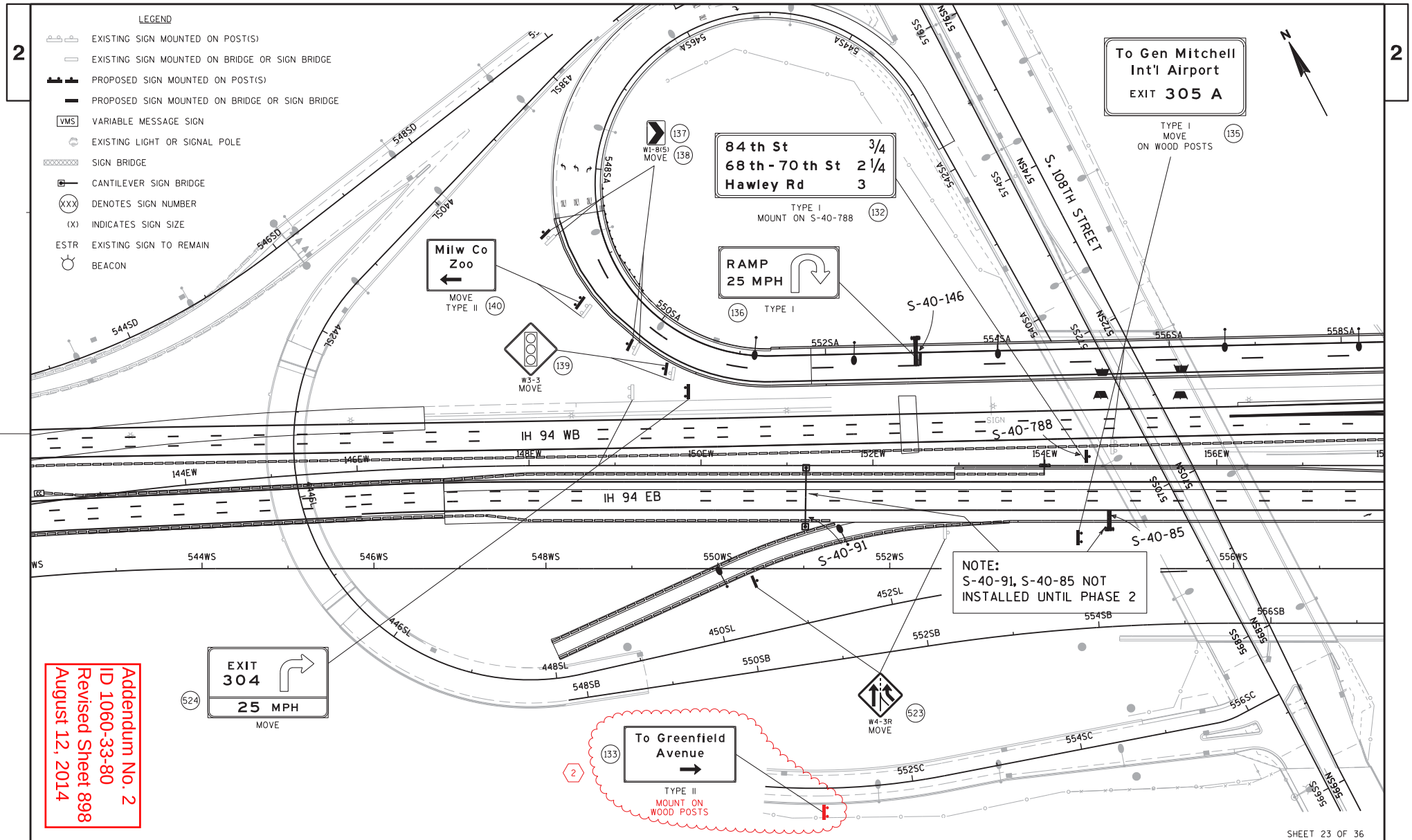
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WISDOT/CADDS SHEET 42

SYM.	COMMON NAME	SCIENTIFIC NAME	AVE. MATURE HEIGHT	SIZE WHEN PLANTED	ROOT ZONE MODE	MINIMUM BALL OR POT SIZE		MINIMUM HOLE SIZE		BRACE OR GUY	FERT. UNITS REQ'D	RODENT PROT'CT REQ'D	MULCH RING DIAM.
						DIAM.	DEPTH	DIAM.	DEPTH				
	DECIDUOUS TREES (SHADE)												
HB	Buckeye, Homestead	Aesculus glabra x octandra 'Homestead'	20'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
NC	Catalpa, Northern	Catalpa speciosa	40'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
KC	Coffeetree, Kentucky	Gymnocladus dioicus 'Espresso'	50'	1 1/2 - 1 3/4" CAL	B&B	22"	13"	46"	13"	GUY	4	NO	58"
CH	Hackberry, Common	Celtis occidentalis	50'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
SH	Honeylocust, Skyline	Gleditsia triacanthos 'Skycole'	50'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
HO	Oak, Heritage	Quercus robur	60'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
SWO	Oak, Swamp White	Quercus bicolor	65'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
BO	Oak, Bur	Quercus macrocarpa	65'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
PR	Locust, Black Purple Robe	Robinia pseudoacacia 'Purple Robe'	35'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
AB	Basswood, American	Tilia americana	70'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
JE	Elm, Jefferson	Ulmus americana 'Jefferson'	50'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
AE	Elm, Accolade	Ulmus japonica x wilsoniana 'Morton'	50'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	GUY	4	NO	60"
	DECIDUOUS TREES (ORNAMENTAL)												
PF	Crabapple, Prairifire	Malus 'Prairifire'	20'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	BRACE	3	YES	60"
RC	Crabapple, Robinson	Malus 'Robinson'	20'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	BRACE	3	YES	60"
TCH	Hawthorn, Thornless Cockspur	Crataegus crus - galli var. inermis	20'	1 3/4 - 2" CAL	B&B	24"	14"	48"	14"	BRACE	3	YES	60"
	EVERGREENS												
EC	Redcedar, Eastern	Juniperus virginiana	35'	5' HT	B&B	20"	12"	44"	12"	BRACE	3	NO	56"
NS	Spruce,Norway	Picea abies	45'	5' HT	B&B	20"	12"	44"	12"	BRACE	3	NO	56"
WS	Spruce, White	Picea glauca	45'	5' HT	B&B	20"	12"	44"	12"	BRACE	3	NO	56"
	SHRUBS												
CD	Dogwood, Corneliancherry (tree form)	Cornus mas 'Golden Glory'	15'	1 1/2" CAL	B&B	20"	12"	44"	12"	BRACE	3	YES	56"

2

Addendum No. 2
ID 1060-33-80
Revised Sheet 832
August 12, 2014



Addendum No. 2
ID 1060-33-80
Revised Sheet 898
August 12, 2014

SHEET 23 OF 36

PROJECT NO: 1060-33-80	HWY: USH 45/IH 94/IH 894	COUNTY: MILWAUKEE	PERMANENT SIGNING	SHEET 898	E

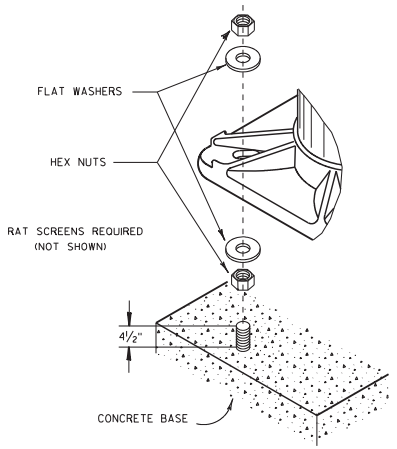
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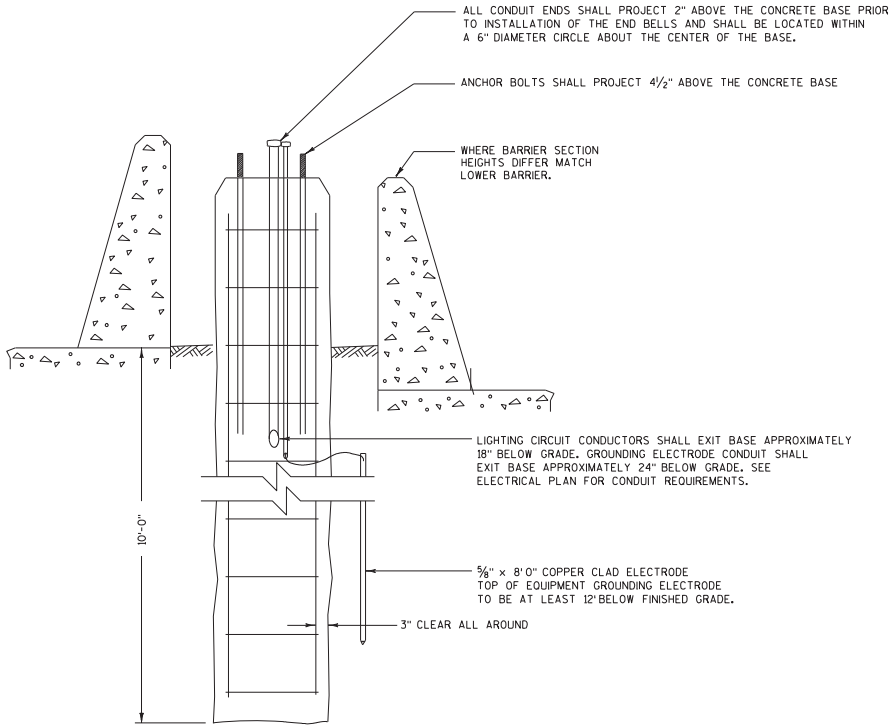
GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

DETAILS OF CONSTRUCTION WITH THE EXCEPTION OF HEIGHT ABOVE GRADE AND CONDUIT SIZE SHALL BE AS DEFINED IN THE STANDARD DETAIL FOR TYPE 8 BASE.

2





CONCRETE BASE, TYPE "B"

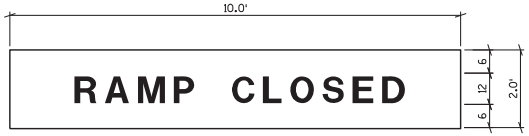
(1" ANCHOR RODS, 15" BOLT CIRCLE, 4½" PROJECTION)

Addendum No. 2
ID 1060-33-80
Revised Sheet 936
August 12, 2014



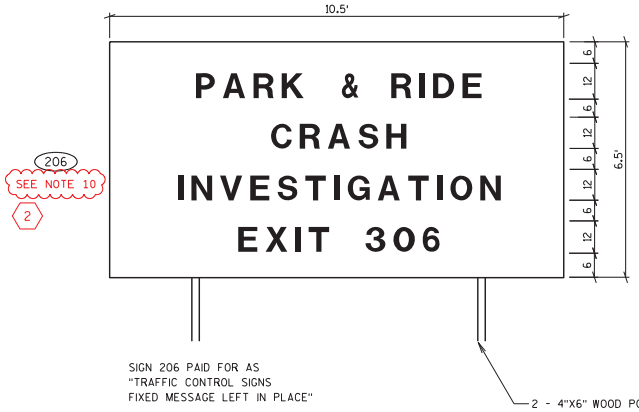
203 404 505
403 503 506

SIGN 506 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"

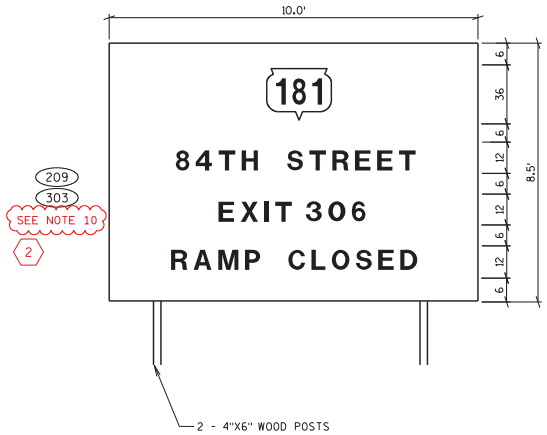


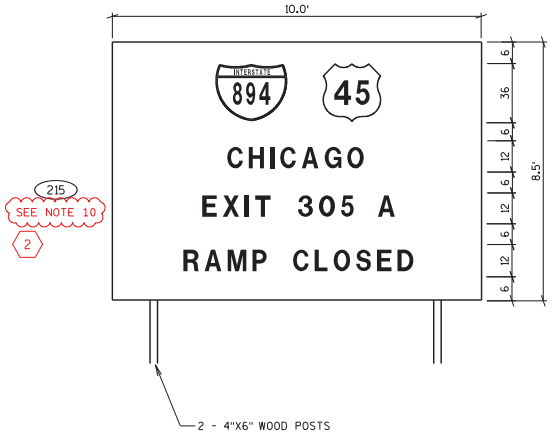
204 211 213 300 304 408 507
205 212 214 301 305 410 508

SIGNS 212, 213, 214, 300, 301,
408, 410, 412 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"



SIGN 206 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"





Addendum No. 2
ID 1060-33-80
Revised Sheet 1112
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

2

SIGN AREA	
GREATER THAN 150 SQ FEET	3 INCH BORDER
60 TO 150 SQ FEET	2 INCH BORDER
LESS THAN 60 SQ FEET	1 INCH BORDER

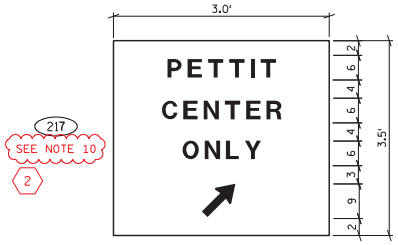
RADIUS	
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

(XXX) = FIXED MESSAGE SIGN NUMBER

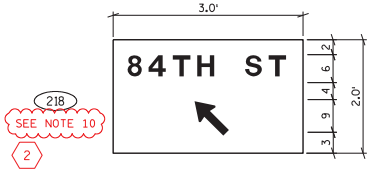












Addendum No. 2
ID 1060-33-80
Revised Sheet 1113
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

2

SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

RADIUS

SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

(XXX) = FIXED MESSAGE SIGN NUMBER

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1113	E

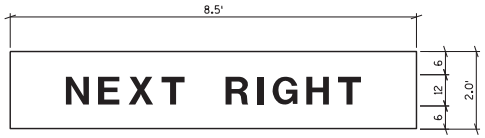
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2

(402)



(416)



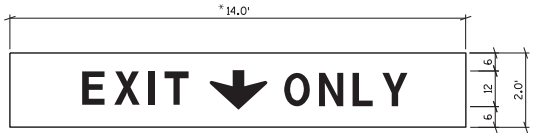
SIGN 416 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"



(419)

Addendum No. 2
ID 1060-33-80
Revised Sheet 1114
August 12, 2014

(409) (411) (501)



SIGNS 409, 411, 501 PAID FOR AS "TRAFFIC CONTROL SIGNS FIXED MESSAGE LEFT IN PLACE"

*WIDTH REQUIRED TO COVER PERMANENT SIGN MESSAGE

(417) SEE NOTE 10 (2)



NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
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9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

(2)

SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

RADIUS

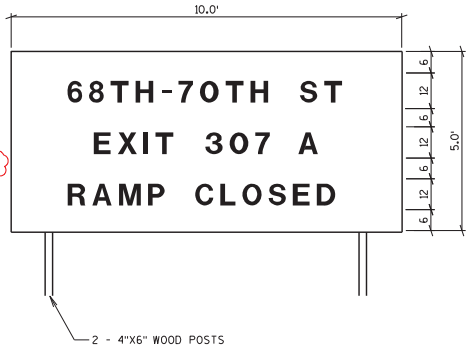
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

(414)



SIGN 414 PAID FOR AS "TRAFFIC CONTROL SIGNS FIXED MESSAGE LEFT IN PLACE"

(418) SEE NOTE 10 (2)

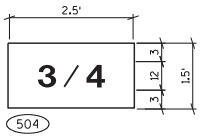


(XXX) = FIXED MESSAGE SIGN NUMBER

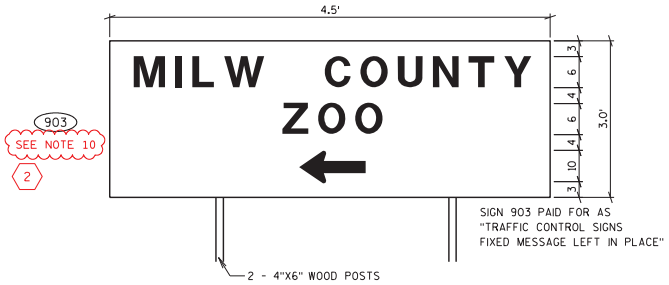
PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1114	E

2

Addendum No. 2
ID 1060-33-80
Revised Sheet 1115
August 12, 2014



SIGN 504 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"

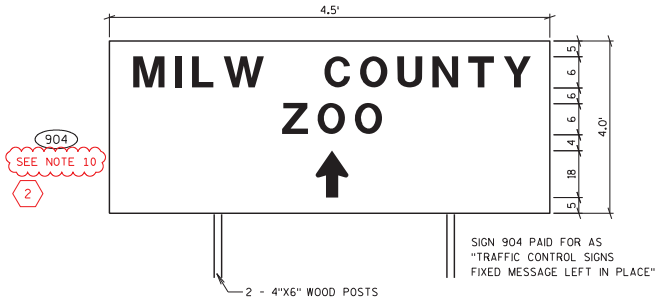


SIGN 903 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"

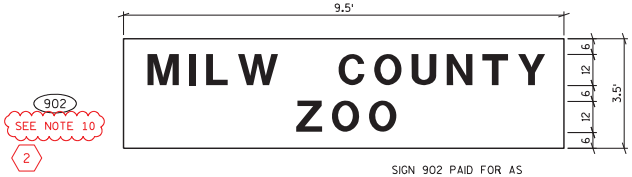


SIGN 510 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"

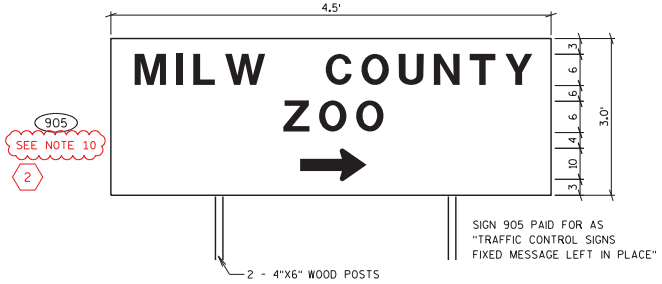
*WIDTH REQUIRED TO COVER
PERMANENT SIGN MESSAGE



SIGN 904 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"



SIGN 902 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"



SIGN 905 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

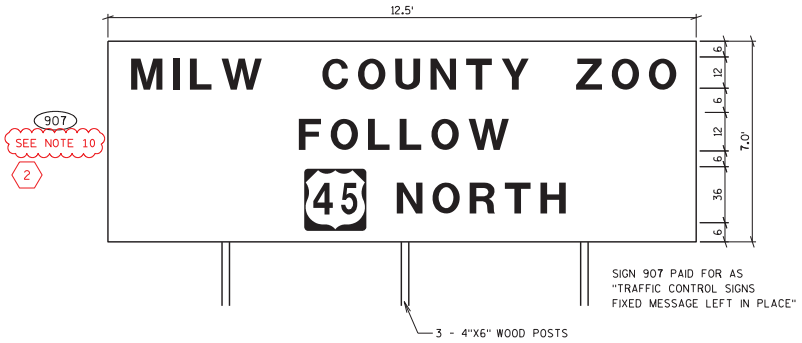
2

SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

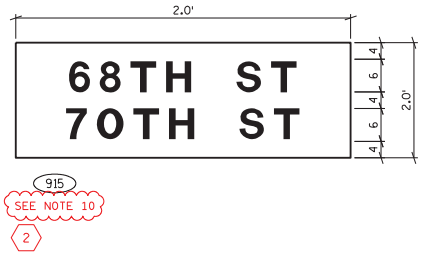
RADIUS

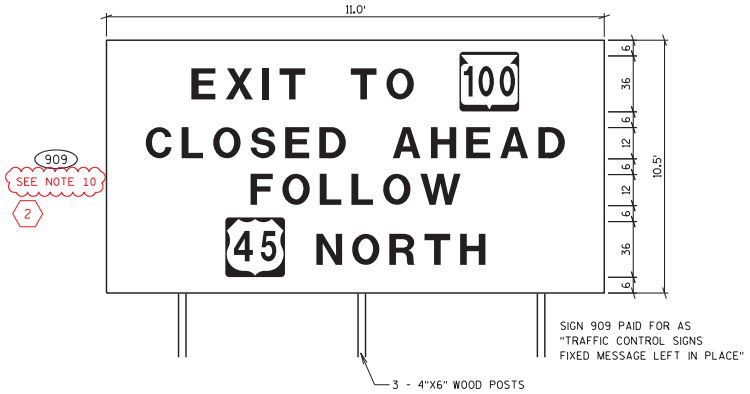
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

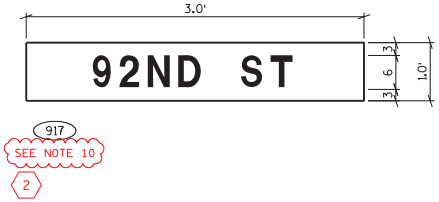
(XXX) = FIXED MESSAGE SIGN NUMBER











Addendum No. 2
ID 1060-33-80
Revised Sheet 1116
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.

2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.

3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.

4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.

5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.

6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".

7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.

8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.

9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

2

10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

RADIUS

SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

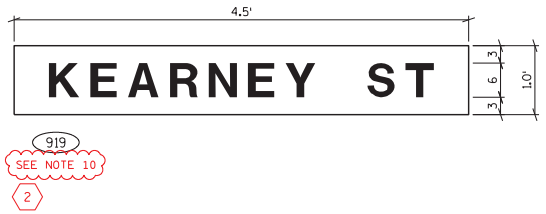
(XXX) = FIXED MESSAGE SIGN NUMBER

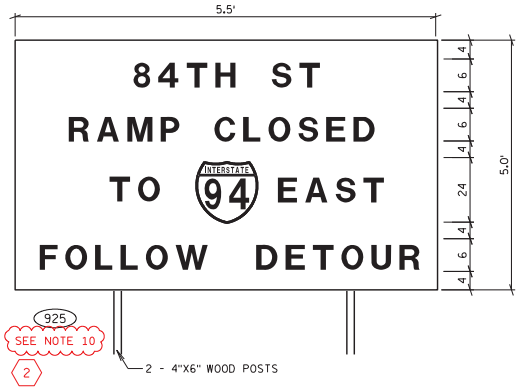
PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1116	E

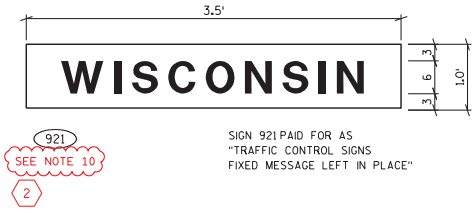
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2

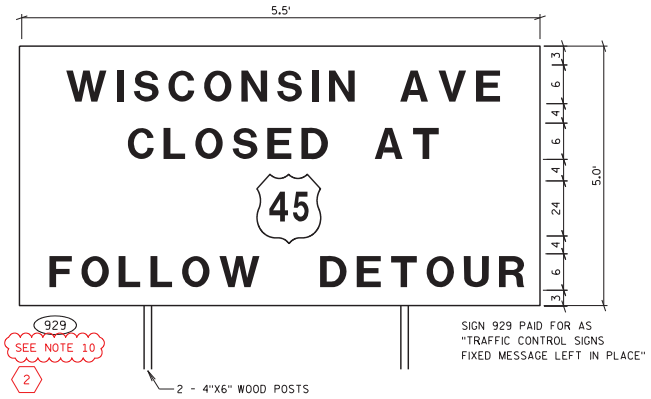
Addendum No. 2
ID 1060-33-80
Revised Sheet 1117
August 12, 2014







SIGN 921 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"



SIGN 929 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.

2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.

3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.

4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.

5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.

6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS:
12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".

7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.

8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.

9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

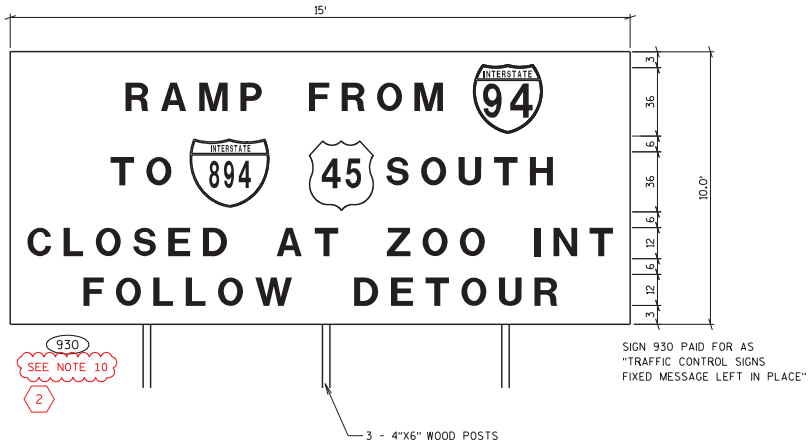
2 10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

RADIUS

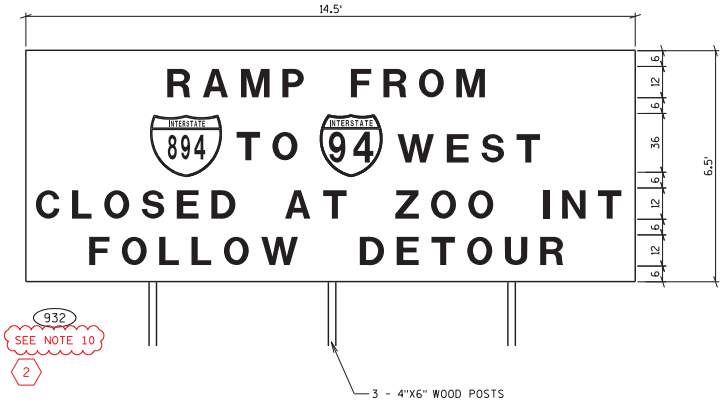
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

(XXX) = FIXED MESSAGE SIGN NUMBER



SIGN 930 PAID FOR AS
"TRAFFIC CONTROL SIGNS
FIXED MESSAGE LEFT IN PLACE"





Addendum No. 2
ID 1060-33-80
Revised Sheet 1118
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

(2)

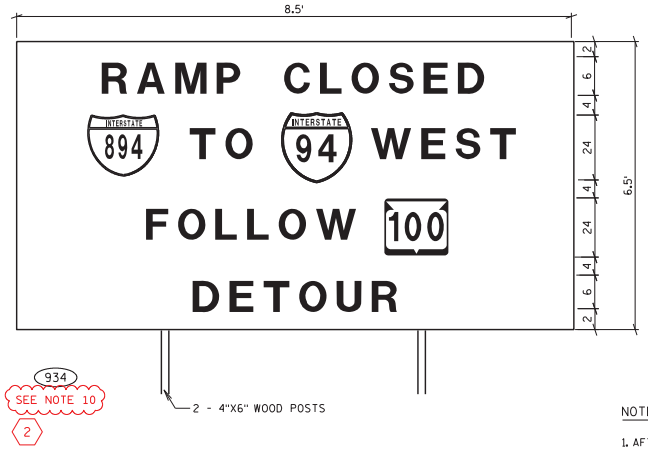
SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

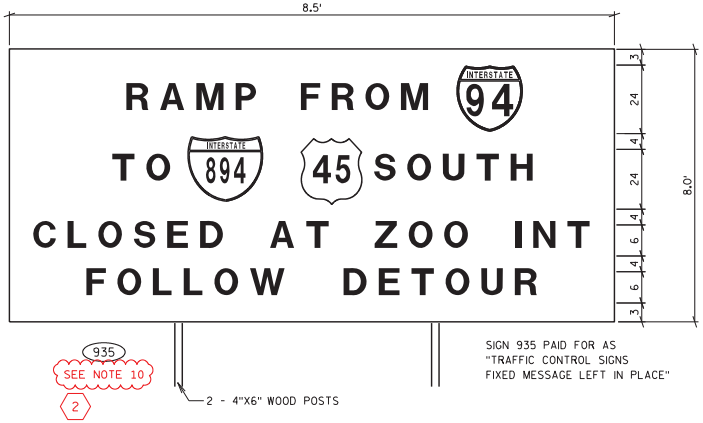
RADIUS

SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

(XXX) = FIXED MESSAGE SIGN NUMBER







Addendum No. 2
ID 1060-33-80
Revised Sheet 1119
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS: (2)

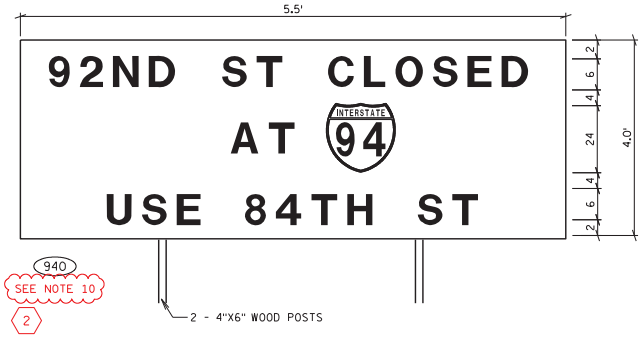
SIGN AREA	
GREATER THAN 150 SQ FEET	3 INCH BORDER
60 TO 150 SQ FEET	2 INCH BORDER
LESS THAN 60 SQ FEET	1 INCH BORDER

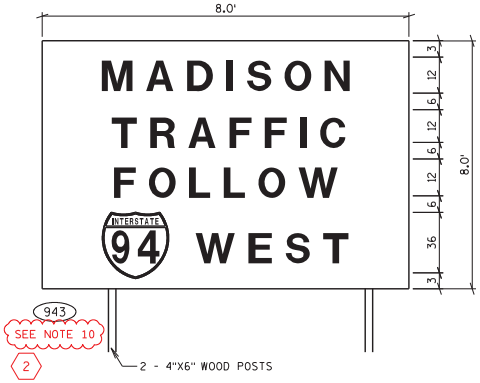
RADIUS	
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

(XXX) = FIXED MESSAGE SIGN NUMBER

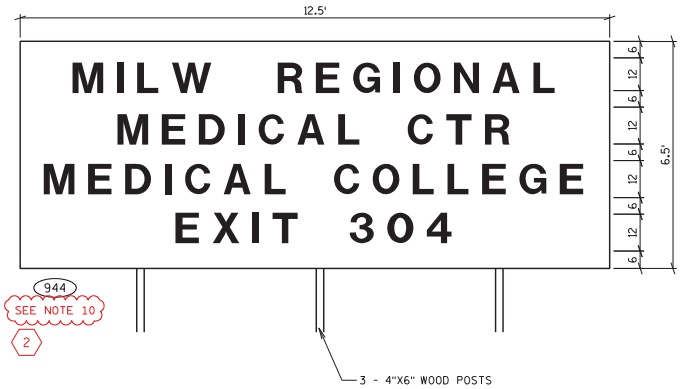
PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1119	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\025104_tc.dgn PLOT DATE : 04-AUG-2014 22:50 PLOT BY : MSCD1S PLOT NAME : 025104_tc7 PLOT SCALE : 100:1











Addendum No. 2
ID 1060-33-80
Revised Sheet 1120
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.

2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.

3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.

4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.

5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.

6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".

7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.

8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.

9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

2

10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

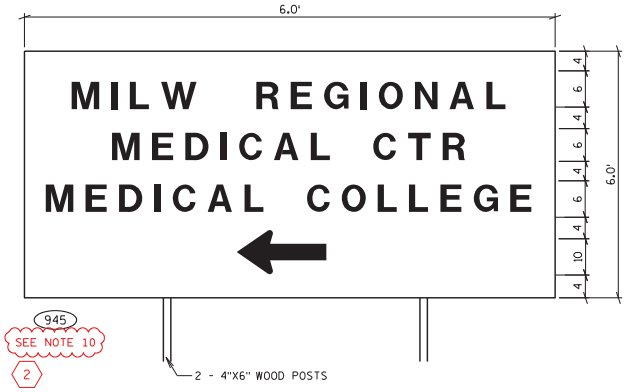
RADIUS

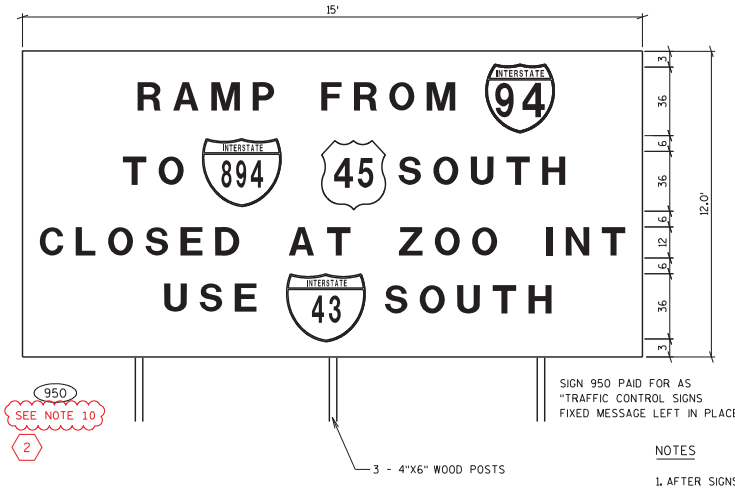
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

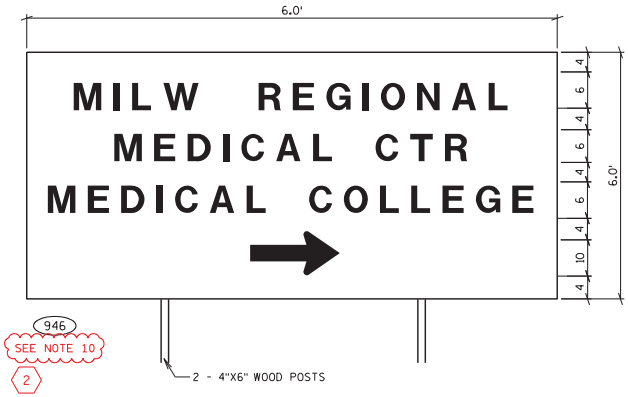
(XXX) = FIXED MESSAGE SIGN NUMBER

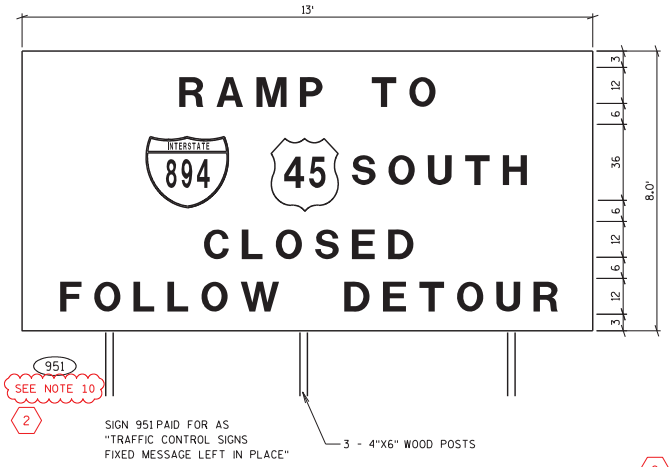
PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1120	E

2









Addendum No. 2
ID 1060-33-80
Revised Sheet 1121
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

SIGN AREA
GREATER THAN 150 SQ FEET = 3 INCH BORDER
60 TO 150 SQ FEET = 2 INCH BORDER
LESS THAN 60 SQ FEET = 1 INCH BORDER

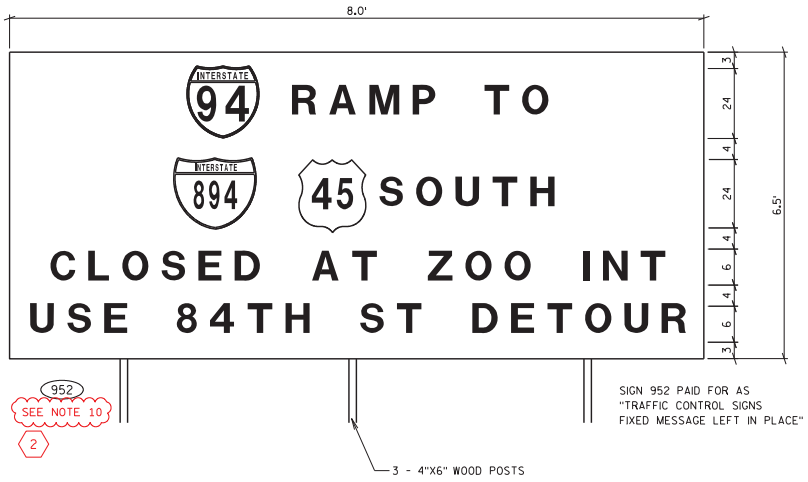
RADIUS

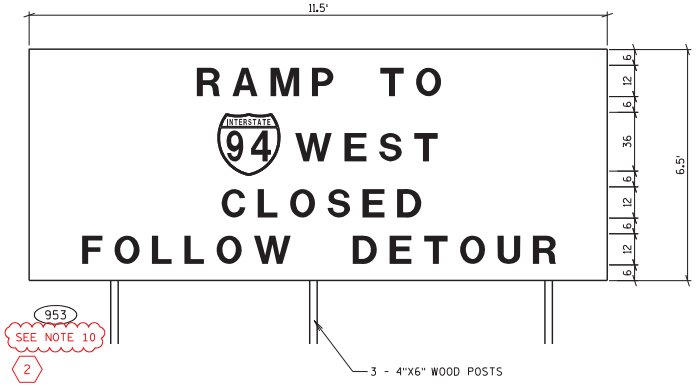
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

2

(XXX) = FIXED MESSAGE SIGN NUMBER

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1121	E







Addendum No. 2
ID 1060-33-80
Revised Sheet 1122
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. (2) ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

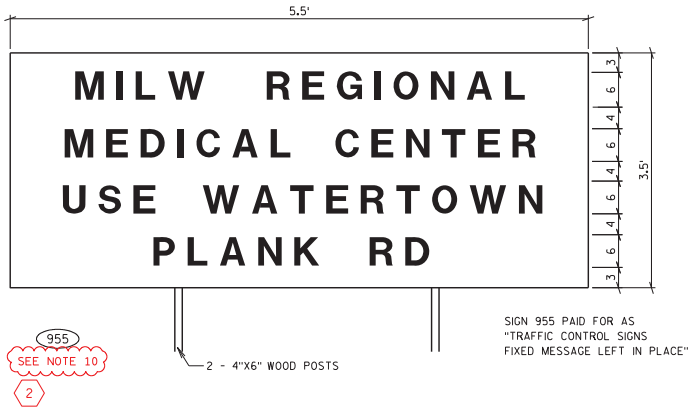
SIGN AREA	
GREATER THAN 150 SQ FEET	3 INCH BORDER
60 TO 150 SQ FEET	2 INCH BORDER
LESS THAN 60 SQ FEET	1 INCH BORDER

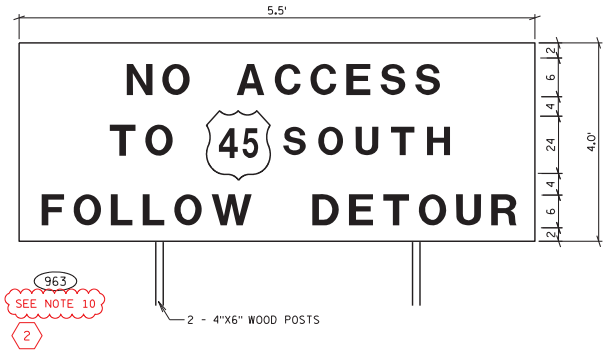
RADIUS	
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

(XXX) = FIXED MESSAGE SIGN NUMBER

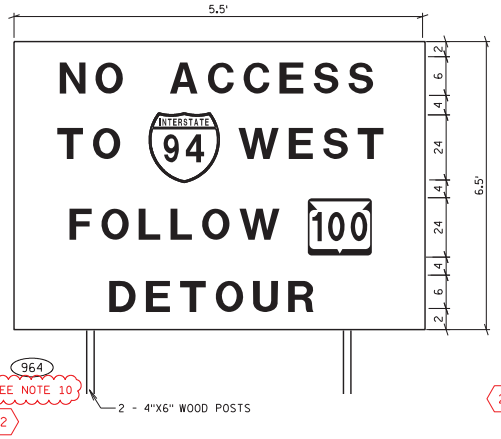
PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1122	E

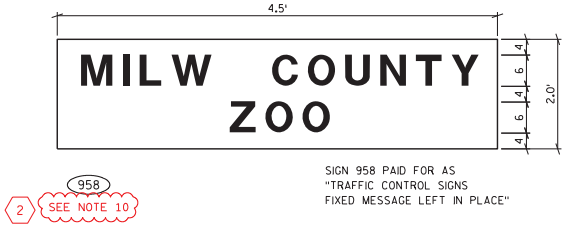
2











Addendum No. 2
ID 1060-33-80
Revised Sheet 1123
August 12, 2014

NOTES

1. AFTER SIGNS HAVE BEEN LOCATED IN THE FIELD, BUT BEFORE INSTALLATION, THE SIGNING AND MARKING SUPERVISOR SHALL VERIFY EACH SIGN LOCATION.
2. ALL SIGNS TO BE MOUNTED ON WOODEN POST SUPPORTS (4"x6"). THE NUMBER OF POSTS REQUIRED FOR EACH LAYOUT IS SHOWN. STEEL POSTS (2"X2") MAY BE USED FOR SIGNS ON SURFACE STREETS. SIGNS WHERE NO POSTS ARE SHOWN TO BE MOUNTED ON EXISTING SIGNS. FOR SIGNS MOUNTED ON POSTS, USE POSTS FROM FHWA LIST OF ACCEPTED BREAKAWAY SIGN SUPPORTS.
3. POSTS SHALL MEET THE BREAKAWAY REQUIREMENTS OF SECTION 643.2.9.1 OF THE STANDARD SPECIFICATIONS AND SIGN PLATE A4-11.
4. SIGNS ON THIS SHEET TO BE PAID UNDER THE ITEM "TRAFFIC CONTROL SIGNS FIXED MESSAGE", UNLESS OTHERWISE NOTED.
5. SIGNS SHALL BE BLACK NON-REFLECTIVE MESSAGE ON ORANGE REFLECTIVE BACKGROUND PER STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS UNLESS OTHERWISE NOTED.
6. ALL SIGNS SHALL HAVE CAPITAL LETTERS AND NUMERALS: 12" CAPS SHALL BE SERIES "D", 6" CAPS SHALL BE SERIES "C".
7. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO MANUFACTURING.
8. SIGN BASE MATERIAL SHALL BE ACCORDING TO SECTION 637.2.1.2 AND 643.2.9.3.
9. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
10. ALL SIGNS NOT MOUNTED WITHIN THE EDGES OF ANOTHER SIGN SHALL HAVE A BORDER & RADIUS OF BORDER AS FOLLOWS:

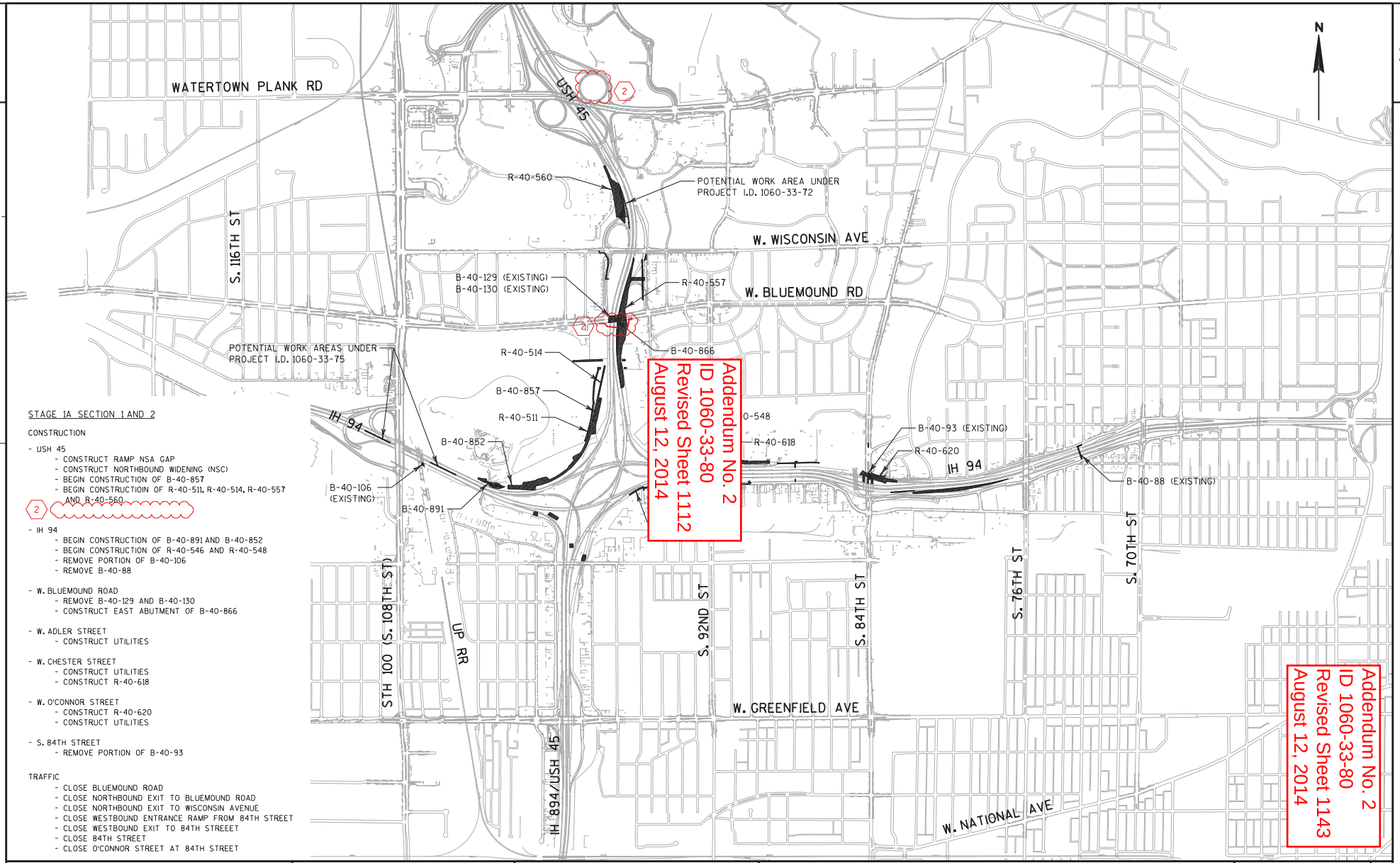
SIGN AREA	
GREATER THAN 150 SQ FEET	= 3 INCH BORDER
60 TO 150 SQ FEET	= 2 INCH BORDER
LESS THAN 60 SQ FEET	= 1 INCH BORDER

RADIUS	
SMALLEST OUTSIDE DIMENSION OF SIGN	CORNER RADIUS
GREATER THAN 8 FEET	12 INCH RADIUS
GREATER THAN OR EQUAL TO 6 FEET	9 INCH RADIUS
GREATER THAN OR EQUAL TO 4 FEET	6 INCH RADIUS
LESS THAN 4 FEET	3 INCH RADIUS

2

(XXX) = FIXED MESSAGE SIGN NUMBER

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL - CONSTRUCTION DETAILS	SHEET 1123	E



STAGE 1A SECTION 1 AND 2

CONSTRUCTION

- USH 45
  - CONSTRUCT RAMP NSA GAP
  - CONSTRUCT NORTHBOUND WIDENING (NSC)
  - BEGIN CONSTRUCTION OF B-40-857
  - BEGIN CONSTRUCTIOIN OF R-40-511, R-40-514, R-40-557 AND R-40-560

(2)

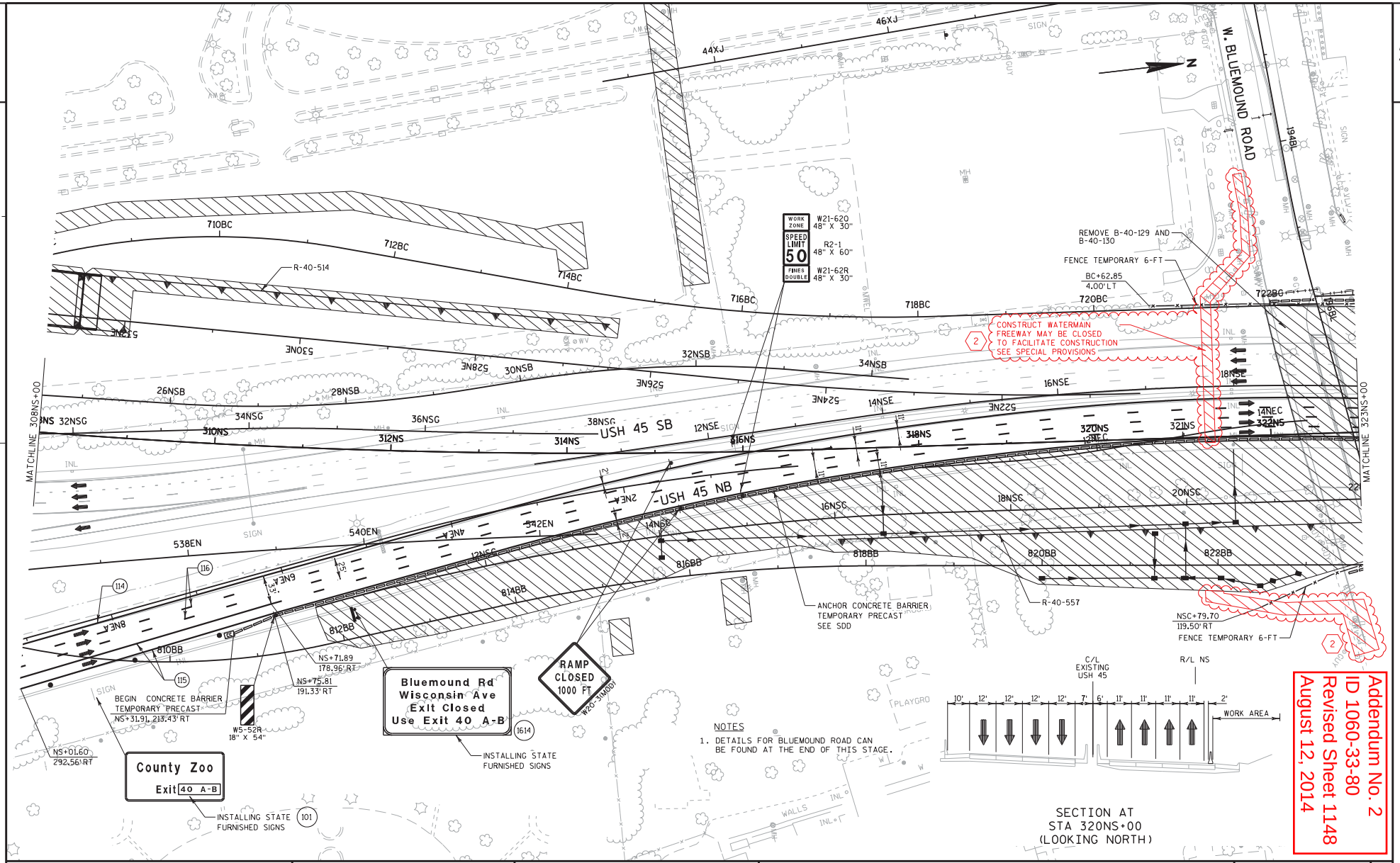
- IH 94
  - BEGIN CONSTRUCTION OF B-40-891 AND B-40-852
  - BEGIN CONSTRUCTION OF R-40-546 AND R-40-548
  - REMOVE PORTION OF B-40-106
  - REMOVE B-40-88
- W. BLUEMOUND ROAD
  - REMOVE B-40-129 AND B-40-130
  - CONSTRUCT EAST ABUTMENT OF B-40-866
- W. ADLER STREET
  - CONSTRUCT UTILITIES
- W. CHESTER STREET
  - CONSTRUCT UTILITIES
  - CONSTRUCT R-40-618
- W. O'CONNOR STREET
  - CONSTRUCT R-40-620
  - CONSTRUCT UTILITIES
- S. 84TH STREET
  - REMOVE PORTION OF B-40-93

TRAFFIC

- CLOSE BLUEMOUND ROAD
- CLOSE NORTHBOUND EXIT TO BLUEMOUND ROAD
- CLOSE NORTHBOUND EXIT TO WISCONSIN AVENUE
- CLOSE WESTBOUND ENTRANCE RAMP FROM 84TH STREET
- CLOSE WESTBOUND EXIT TO 84TH STREEET
- CLOSE 84TH STREET
- CLOSE O'CONNOR STREET AT 84TH STREET

PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	TRAFFIC CONTROL STAGE 1A OVERVIEW	SHEET 1143	E

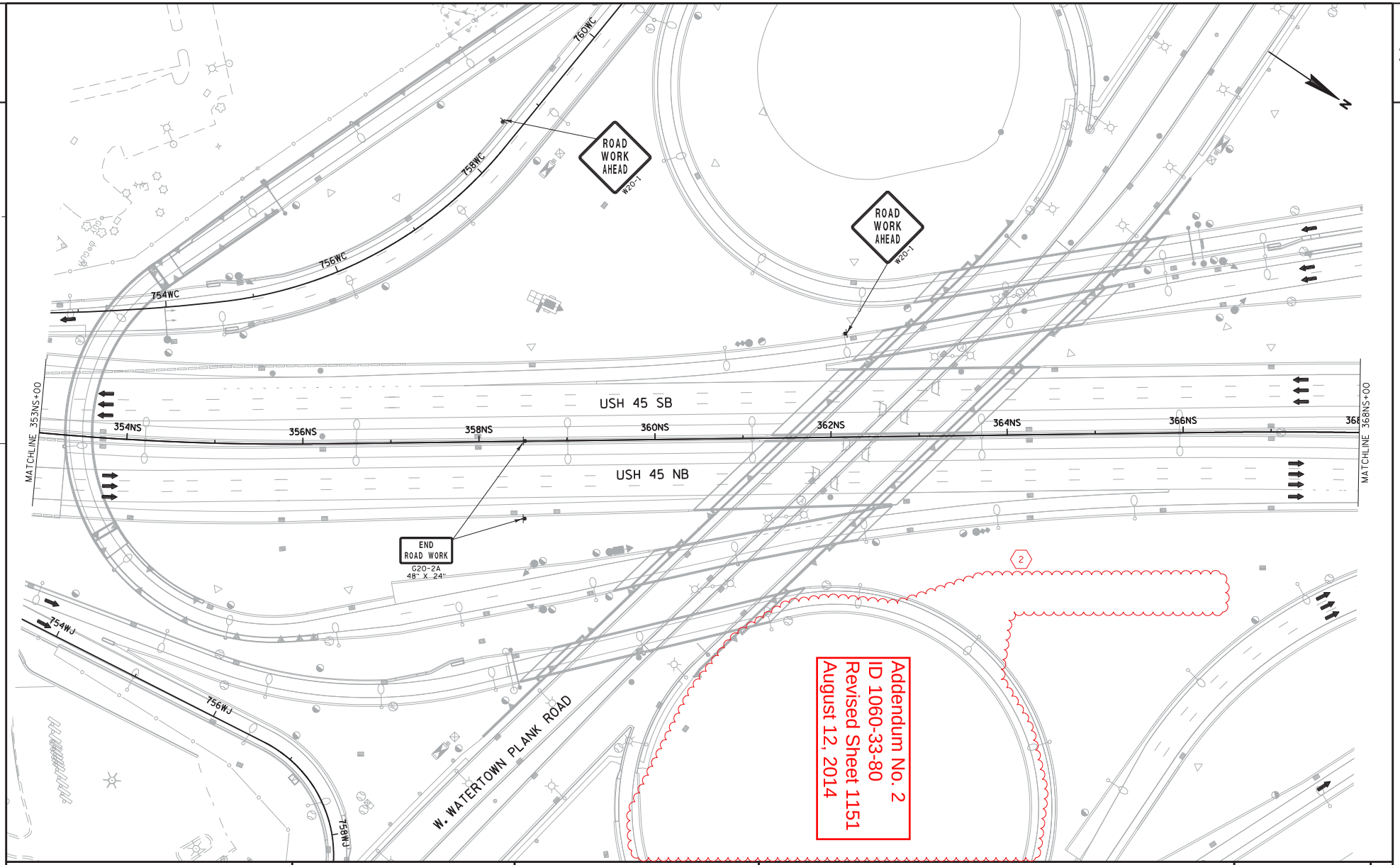
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PLOT BY : MSCSRM
PLOT NAME :
PLOT SCALE : 1500:1
WISDOT/CADDS SHEET 42



PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 1A CONSTRUCTION	SHEET 1148	E

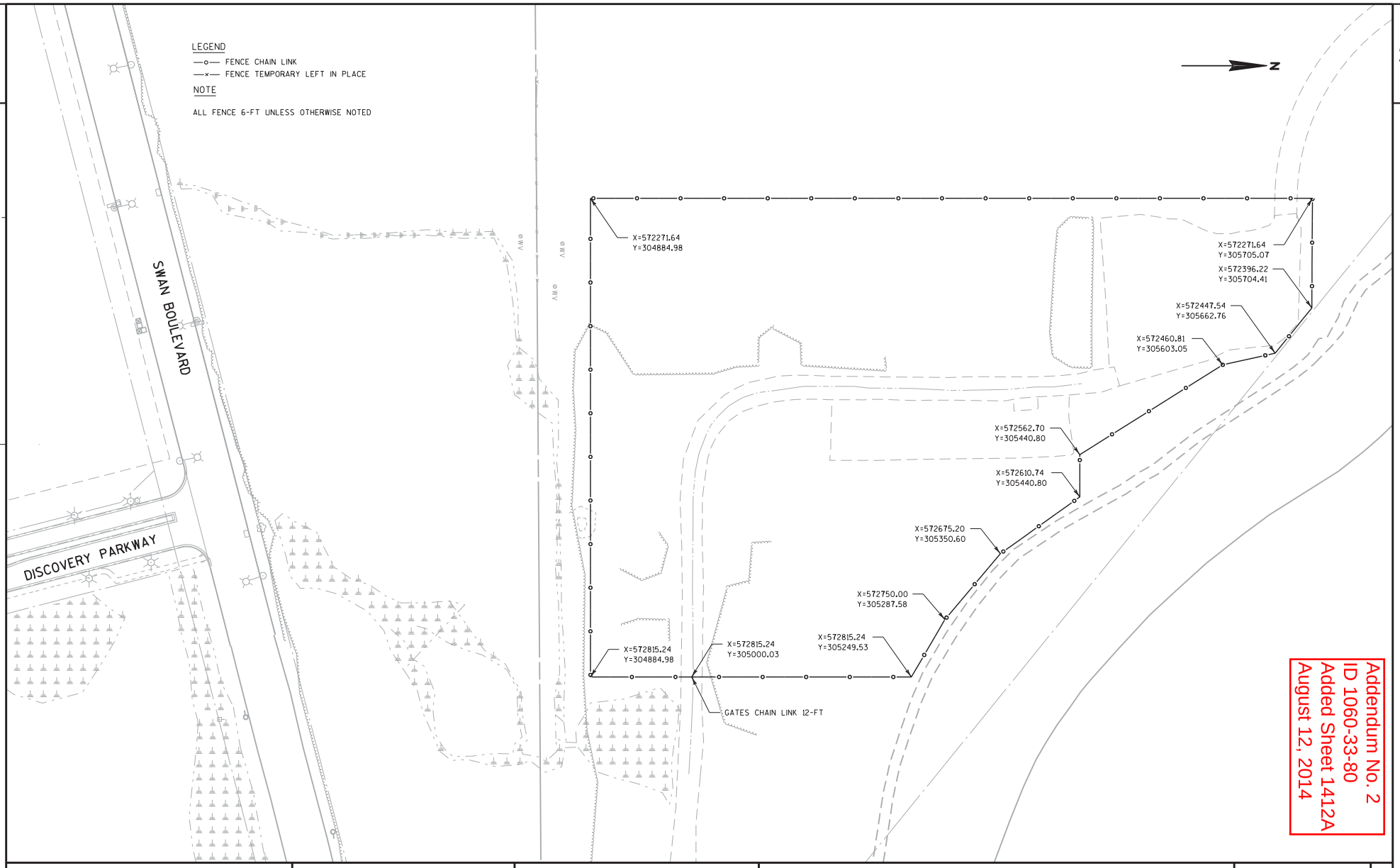
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WISDOT/CADDS SHEET 42



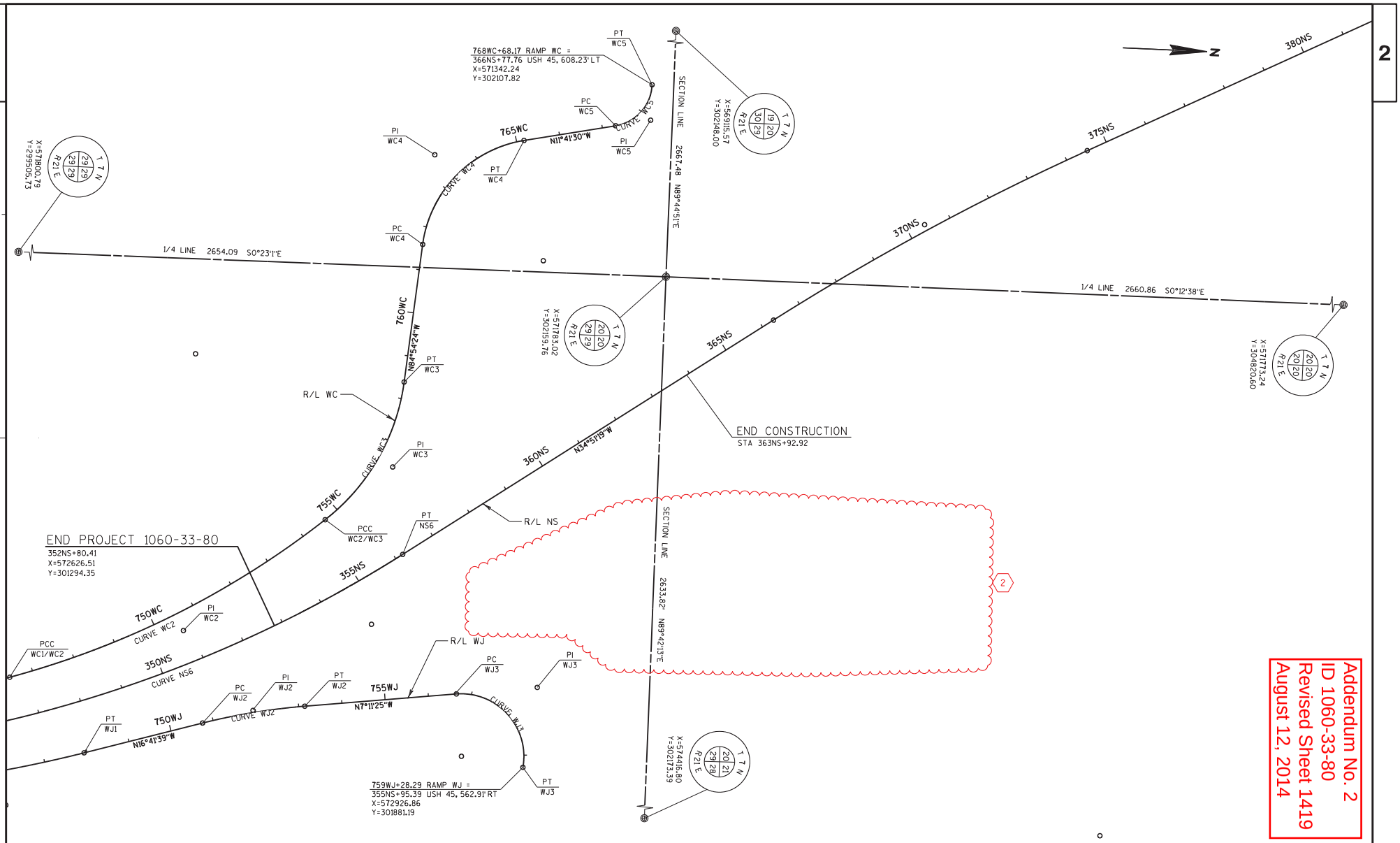
PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	STAGE 1A CONSTRUCTION	SHEET 1151	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\026015_s1a.dgn PLOT DATE : 07-AUG-2014 09:17 PLOT BY : MSCSRM PLOT NAME : 026015_s1a PLOT SCALE : 100:1



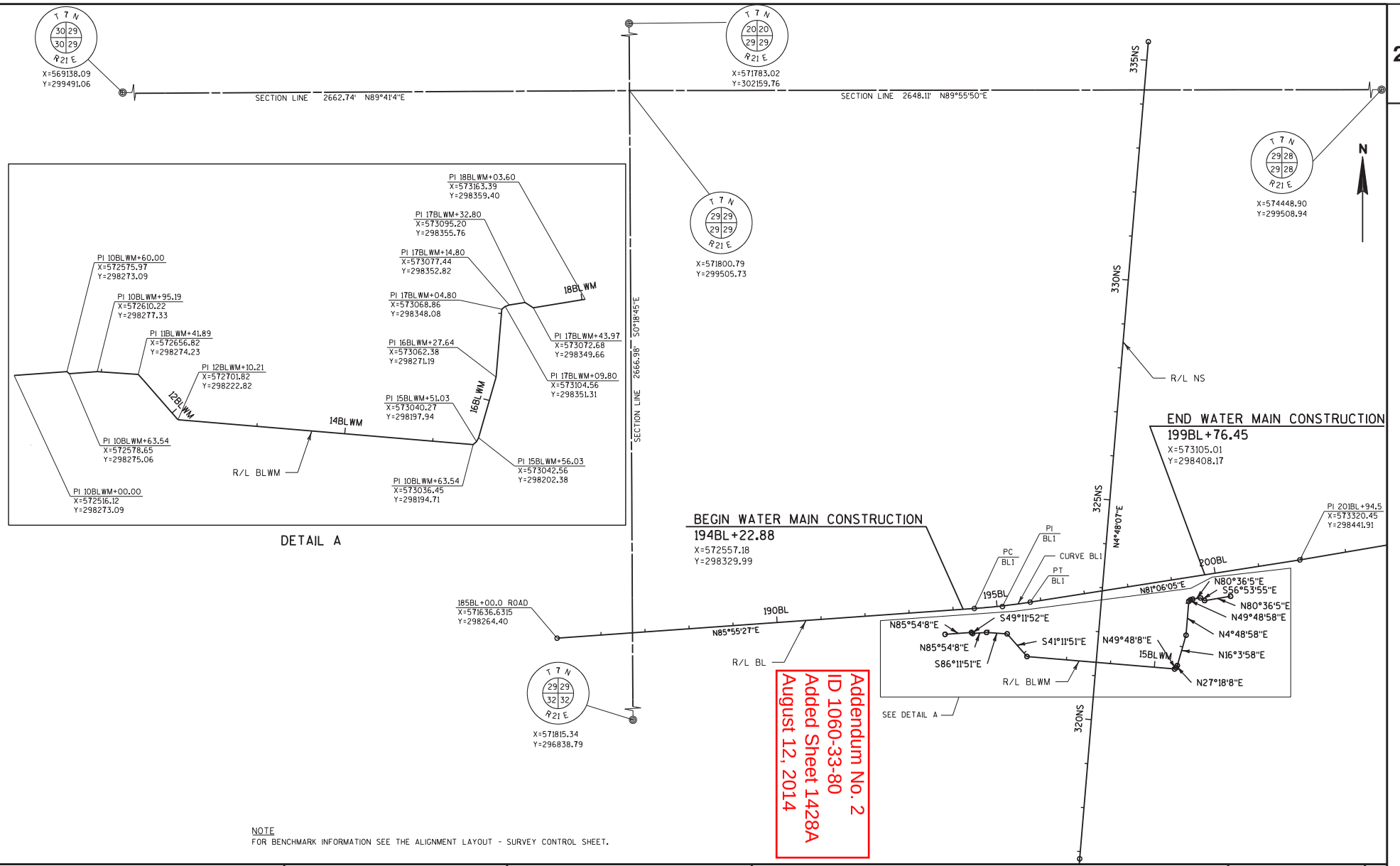
PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	FENCING - DNR FORESTRY SITE	SHEET 1412A	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\027128_fn.dgn PLOT DATE : 07-AUG-2014 13:34 PLOT BY : MSCDYB PLOT NAME : 027128_fn PLOT SCALE : 100:1



PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	ALIGNMENT LAYOUT	SHEET 1419	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\027207_ad.dgn PLOT DATE : 05-AUG-2014 17:22 PLOT BY : MSCD1S PLOT NAME : 027207_ad PLOT SCALE : 200:1



NOTE
FOR BENCHMARK INFORMATION SEE THE ALIGNMENT LAYOUT - SURVEY CONTROL SHEET.

PROJECT NO: 1060-33-80	HWY: IH 94/IH 894/USH 45	COUNTY: MILWAUKEE	ALIGNMENT LAYOUT	SHEET 1428A	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\027217_ad.dgn PLOT DATE : 05-AUG-2014 11:45 PLOT BY : MSCKKC PLOT NAME : 027217_ad PLOT SCALE : 200:1

CLEARING AND GRUBBING ITEMS

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	201.0105 CLEARING STA	201.0205 GRUBBING STA	201.0120 CLEARING ID	201.0220 GRUBBING ID
		MAINLINE								
1000	1	IH 894/USH 45								
			320NS+00	-	322NS+00	75' RT	2	2	--	--
			323NS+87			73' RT	--	--	10	10
			324NS+26			135' RT	--	--	14	14
			324NS+36			154' RT	--	--	11	11
			324NS+88			187' RT	--	--	14	14
			325NS+03			167' RT	--	--	20	20
			325NS+44			85' RT	--	--	3	3
			341NS+00	-	343NS+00	100' LT	2	2	--	--
			343NS+29			109' LT	--	--	12	12
			343NS+39			119' LT	--	--	10	10
			343NS+74			67' LT	--	--	2	2
			344NS+91			82' LT	--	--	2	2
			345NS+00	-	350NS+00	115' LT	5	5	--	--
		RAMPS								
		RAMP NW								
			488NW+55			67' RT	--	--	4	4
			489NW+20			65' RT	--	--	4	4
			489NW+65			59' RT	--	--	4	4
			489NW+74			69' RT	--	--	4	4
			490NW+00	-	492NW+00	RT	2	2	--	--
			495NW+40			27' LT	--	--	10	10
		RAMP WS								
			583WS+00	-	586WS+00	LT	3	3	--	--
		RAMP NE								
			522NE+00	-	540NE+00	--	18	18	--	--
		RAMP BC								
			719BC+00	-	722BC+00	--	3	3	--	--
		RAMP BB								
			817BB+00	-	821BB+00	--	4	4	--	--
			812BB+87			7' RT	--	--	12	12
			813BB+10			15' RT	--	--	6	6
			815BB+65			7' LT	--	--	6	6
			816BB+39			17' LT	--	--	12	12
			819BB+81			52' LT	--	--	2	2
			819BB+88			62' LT	--	--	8	8
			819BB+88			86' LT	--	--	2	2
			819BB+97			82' LT	--	--	2	2
		RAMP SA								
			567SA+00	-	574SA+00	RT/LT	7	7	--	--
		RAMP FA								
			741FA+37			6' LT	--	--	12	12
			738FA+00	-	741FA+00	15' LT	3	3	--	--
		RAMP FC								
			797FC+00	-	800FC+00	40' RT	3	3	--	--
			802FC+80			41' RT	--	--	12	12

Addendum No. 2
ID 1060-33-80
Revised Sheet 1493
August 12, 2014

CLEARING AND GRUBBING ITEMS (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	201.0105 CLEARING STA	201.0205 GRUBBING STA	201.0120 CLEARING ID	201.0220 GRUBBING ID
1000	1		803FC+24			42' RT	--	--	12	12
			803FC+63			44' RT	--	--	10	10
		RAMP FD								
			724FD+00	-	729FD+00	20' LT	5	5	--	--
			736FD+14			6' RT	--	--	4	4
			736FD+22			1' RT	--	--	24	24
		RAMP FH								
			816FH+00	-	818FH+00	50' LT	2	2	--	--
			821FH+00	-	822FH+00	1' LT	1	1	--	--
		LOCAL ROADS								
		W. BLUEMOUND ROAD								
			192BL+45			7' LT	--	--	18	18
			192BL+49			50' LT	--	--	18	18
			193BL+80			70' RT	--	--	8	8
			194BL+84			75' RT	--	--	8	8
			197BL+91			65' RT	--	--	10	10
			199BL+19			54' RT	--	--	4	4
			199BL+70			53' RT	--	--	8	8
			200BL+15			53' RT	--	--	3	3
			200BL+61			52' RT	--	--	5	5
			201BL+00	-	203BL+00	57' RT	2	2	--	--
			203BL+96			1' RT	--	--	12	12
		N. 95TH STREET								
			35TRS+00	-	39TRS+00	25' LT	4	4	--	--
		W. CHESTER STREET								
			44CH+98			11' LT	--	--	11	11
			45CH+27			4' LT	--	--	6	6
			45CH+81			7' LT	--	--	3	3
			46CH+22			9' LT	--	--	16	16
			46CH+72			12' LT	--	--	19	19
			47CH+28			13' LT	--	--	2	2
			48CH+31			15' LT	--	--	15	15
			48CH+75			15' LT	--	--	4	4
			49CH+22			16' LT	--	--	12	12
			50CH+00	-	54CH+00	5' LT	4	4	--	--
			54CH+00	-	55CH+00	1' LT	1	1	--	--
			55CH+45	-	59CH+97	30' LT	5	5	--	--
		S. 84TH STREET								
			43F+00	-	47F+00	75' LT	4	4	--	--
			43F+29			75' RT	--	--	12	12
			43F+51			1' RT	--	--	6	6
		SUBTOTALS					80	80	448	448
		MAINLINE								
1000	2	IH 894/USH 45								
			221NS+00	-	229NS+00	90' LT	8	8	--	--
			279NS+82			89' RT	--	--	10	10
			282NS+39			164' RT	--	--	10	10

(CONTINUED ON NEXT SHEET)

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\030201_mq_pav.ppt PLOT DATE : 8/6/2014 5:54:32 PM PLOT BY : MSCCEJ PLOT NAME : 030201_mq_pav1 PLOT SCALE : 1:1

CLEARING AND GRUBBING ITEMS (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	201.0105 CLEARING STA	201.0205 GRUBBING STA	201.0120 CLEARING ID	201.0220 GRUBBING ID
1000	3		997AD+12			21' RT	--	--	8	8
			999AD+08			22' RT	--	--	26	26
			999AD+44			22' RT	--	--	28	28
			999AD+84			22' RT	--	--	14	14
			1000AD+64			22' RT	--	--	18	18
			1003AD+46			44' RT	--	--	26	26
			1004AD+08			22' RT	--	--	18	18
			1004AD+48			22' RT	--	--	18	18
			1005AD+22			22' RT	--	--	12	12
			1008AD+42			22' RT	--	--	18	18
			1009AD+30			22' RT	--	--	14	14
			1010AD+58			22' RT	--	--	14	14
			1010AD+98			22' RT	--	--	16	16
			1011AD+85			22' RT	--	--	18	18
			1012AD+30			22' RT	--	--	18	18
			1012AD+72			22' RT	--	--	16	16
			1015AD+12			22' RT	--	--	16	16
			1015AD+66			22' RT	--	--	14	14
			1017AD+66			22' RT	--	--	10	10
			1018AD+96			18' RT	--	--	12	12
		SUBTOTALS					4	4	498	498
		MAINLINE								
1000	4	IH 894/USH 45								
			289NS+77			206' RT	--	--	10	10
			298NS+00	-	300NS+00	48' RT	2	2	--	--
		IH 94								
			260EW+00	-	263EW+00	106' RT	3	3	--	--
			281EW+00	-	285EW+00	100' RT	4	4	--	--
		RAMPS								
		RAMP FC								
			831FC+00	-	837FC+00	30' RT	6	6	--	--
		RAMP TMC								
			773TMC+00	-	778TMC+00	--	5	5	--	--
		SUBTOTALS					20	20	10	10
		TOTALS					269	269	1,219	1,219

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REMOVING PAVEMENT

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.0100 REMOVING PAVEMENT SY	COMMENTS
		MAINLINE						
1000	1	IH 894/USH 45 NB						
			311NS+21	-	320NS+00	RT	1,092	
			315NS+26	-	319NS+85	RT	344	
			320NS+00	-	327NS+61	LT	2,655	
			320NS+00	-	333NS+41	RT	2,394	NB EXIT RAMP AT W. BLUEMOUND RD
		IH 894/USH 45 SB						
			313NS+63	-	320NS+00	LT	450	
			318NS+23	-	320NS+00	LT	222	
			320NS+00	-	329NS+10	LT	810	
		IH 94 WB						
			254EW+87	-	280EW+23	LT	7,475	
		RAMPS						
		RAMP NE						
			542NE+06	-	521NE+88	RT/LT	8,597	
		RAMP NSC						
			10NSC+00	-	32NSC+63	RT/LT	4,076	
		LOCAL ROADS						
		W. BLUEMOUND RD						
			191BL+20	-	196BL+04	RT/LT	4,540	
			197BL+91	-	205BL+82	RT/LT	6,340	
		W. WISCONSIN AVENUE						
			UTILITY WORK			RT/LT	85	
		N. 97TH STREET						
			UTILITY WORK			RT/LT	83	
			UTILITY WORK			RT/LT	27	
		N. 95TH STREET						
			35TRS+86	-	38TRS+66	RT/LT	1,018	
			40TRN+21	-	44TRN+18	LT	660	
			UTILITY WORK			RT/LT	20	
		W. ADLER STREET						
			UTILITY WORK			RT/LT	1,373	
		W. CHESTER STREET						
			50CH+54	-	53CH+92	RT/LT	921	
		87TH PLACE						
			UTILITY WORK			RT	136	
		87TH STREET						
			UTILITY WORK			RT	133	
		86TH STREET						
			UTILITY WORK			RT	115	

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(CONTINUED ON NEXT SHEET)

REMOVING PAVEMENT (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.0100 REMOVING PAVEMENT SY	COMMENTS
1000	1	S. 84TH STREET						
			UTILITY WORK			RT/LT	1,922	
		TEMPORARY ROADS						
		RAMP NSE						
			10NSE+00	-	25NSE+58	LT/RT	5,221	
		BOX CULVERT B-40-93 EXISTING BOX CULVERT						
			2FCV+16	-	2FCV+79	LT/RT	363	
		SUBTOTAL					51,072	2
		MAINLINE						
1000	2	IH 894/USH 45 NB						
			280NS+89	-	285NS+34	RT	3,882	
			293NS+33	-	296NS+87	RT/LT	758	ES RAMP FOR USH 45 NB
			335NS+23	-	341NS+97	RT	3,394	NB ENTRANCE RAMP AT W. WISCONSIN AVE
		IH 894/USH 45 SB						
			315NS+60	-	320NS+00	LT	1,980	
			320NS+00	-	327NS+15	LT	2,695	
			334NS+61	-	340NS+28	LT	4,025	SB RAMPS AT W. WISCONSIN AVENUE
			340NS+37	-	343NS+58	RT	305	
		IH 94 EB						
			136EW+40	-	143EW+79	RT/LT	1,159	EXISTING IH 94 EB EXIT RAMP
			147EW+00	-	150EW+45	RT/LT	299	EXISTING IH 94 EB EXIT RAMP
			152EW+28	-	154EW+69	RT/LT	688	
			156EW+24	-	160EW+33	LT	524	
			161EW+98	-	176EW+44	RT/LT	1,867	EXISTING IH 94 EB AND WB
			173EW+69	-	183EW+78	RT	1,153	
			195EW+05	-	201EW+82	RT	541	EXISTING IH 94 EB
			299EW+90	-	301EW+30	RT	70	
		IH 94 WB						
			185EW+56	-	189EW+19	LT	280	FOR TEMPORARY PAVEMENT
			201EW+62	-	206EW+77	LT	590	EXISTING IH 94 EB AND WB
			227EW+45	-	234EW+44	LT	1,479	EXISTING IH 94 EB AND WB
			235EW+80	-	236EW+95	LT	421	EXISTING IH 94 WB
			243EW+17	-	257EW+08	LT	4,777	
			272EW+63	-	285EW+25	LT	2,632	
		RAMPS						
		RAMP SW						
			568SW+26	-	581SW+70	RT	5,676	
		RAMP FA						
			738FA+09	-	750FA+75	RT/LT	4,360	
		RAMP FH						
			811FH+68	-	817FH+77	RT/LT	1,648	
			817FH+77	-	822FH+79	RT/LT	1,651	
		RAMP TMD						
			777TMD+17	-	786TMD+40	RT/LT	3,437	

REMOVING PAVEMENT (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.0100 REMOVING PAVEMENT SY	COMMENTS
		LOCAL ROADS						
1000	2	S. 100TH STREET						
			31TD+73	-	37TD+21	RT	517	
		SCHLINGER AVE						
			528SCH+65	-	530SCH+84	LT	418	
		W. BLUEMOUND RD						
			202BL+38	-	205BL+82	LT	1,031	
		N. 97TH STREET						
			322NS+84	-	330NS+50	LT	3,631	
		N. 95TH STREET						
			40TRN+21	-	48TRN+55	RT/LT	3,825	
		CHESTER STREET						
			43CH+30	-	49CH+53	RT/LT	2,363	
			55CH+45	-	59CH+26	RT	1,229	
			55CH+68	-	56CH+14	RT/LT	275	
			59CH+36	-	60CH+02	RT/LT	929	
		W. ADLER STREET						
			987AD+28	-	994AD+50	LT	1,274	
			996AD+25	-	1022AD+66	LT	6,294	
		92ND STREET						
			66TJ+15	-	69TJ+07	RT/LT	2,257	
		S. 84TH STREET						
			42F+71	-	48F+43	RT/LT	3,212	
		O'CONNOR STREET						
			543CR+16	-	548CR+80	RT/LT	2,064	
			578CR+20	-	581CR+13	RT/LT	1,315	
		W. DIXON STREET						
			UTILITY WORK			RT/LT	80	
		TEMPORARY ROADS						
		RAMP NWA						
			18NWA+18	-	23NWA+16	LT	817	
		SUBTOTAL					81,822	
		MAINLINE						
1000	3	IH 894/USH 45 NB						
			276NS+00	-	279NS+57	RT	2,723	
			306NS+73	-	315NS+22	RT/LT	973	
		IH 94 EB						
			160EW+33	-	168EW+98	LT	2,185	EXISTING IH 94 EB
			207EW+05	-	236EW+00	RT	11,186	EXISTING IH 94 EB

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(CONTINUED ON NEXT SHEET)

REMOVING PAVEMENT (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.0100 REMOVING PAVEMENT SY	COMMENTS
1000	3		239EW+10	-	243EW+00	RT	400	EXISTING IH 94 EB
			245EW+40	-	253EW+70	RT	279	EXISTING IH 94 EB
		IH 94 WB						
			201EW+62	-	206EW+77	LT	590	EXISTING IH 94 EB AND WB
			206EW+63	-	232EW+21	LT	7,027	EXISTING IH 94 EB
			240EW+34	-	265EW+96	LT	5,880	EXISTING IH 94 EB
			266EW+36	-	284EW+43	LT	6,324	EXISTING IH 94 EB
		RAMPS						
		RAMP NE						
			555NE+50	-	580NE+50	RT	14,185	EXISTING IH 94 WB
		RAMP SA						
			550SA+23	-	572SA+69	RT	10,967	
		LOCAL ROADS						
		W. ADLER STREET						
			987AD+28	-	995AD+14	RT	1,388	
			995AD+88	-	1022AD+66	RT	6,178	
		S. 92ND STREET						
			61TJ+85	-	63TJ+33	RT/LT	1,313	
		SUBTOTAL					71,598	
		MAINLINE						
1000	4	IH 894/USH 45 NB						
			268NS+25	-	276NS+00	RT	3,348	
			298NS+02	-	310NS+17	RT	8,408	
		IH 894/USH 45 SB						
			265NS+61	-	272NS+75	RT/LT	813	
			310NS+03	-	319NS+08	RT/LT	4,769	
			315NS+20	-	320NS+00	RT/LT	1,104	
			320NS+00	-	331NS+29	RT/LT	3,600	
		IH 94 EB						
			231EW+80	-	236EW+87	RT	1,418	
			238EW+62	-	284EW+43	RT	28,340	
		RAMPS						
		RAMP WS						
			582WS+30	-	583WS+17	LT	115	FOR TEMPORARY RAMP WSA
			585WS+68	-	586WS+34	LT	131	FOR TEMPORARY RAMP WSA
		RAMP NW						
			479NW+85	-	490NW+39	RT	5,250	
		RAMP NE						
			566NE+56	-	582NE+41	RT	6,063	
		RAMP FC						
			827FC+38	-	831FC+46	RT/LT	772	

REMOVING PAVEMENT (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.0100 REMOVING PAVEMENT SY	COMMENTS
1000	4	RAMP TMC						
			777TMC+61	-	783TMC+52	RT/LT	1,541	
		RAMP EWB						
			15EWB+16	-	37EWB+50	RT/LT	2,983	
		RAMP EWC						
			168EWC+50	-	174EWC+42	RT/LT	1,544	
		RAMP EWD						
			10EWD+00	-	24EWD+74	RT/LT	2,615	
		LOCAL ROADS						
		W. ADLER STREET						
			994AD+50	-	995AD+14	RT/LT	187	
			995AD+98	-	996AD+25	RT/LT	136	
			1022AD+66	-	1023AD+87	RT/LT	687	
		S. 92ND STREET						
			63TJ+33	-	63TJ+84	RT/LT	428	
		S. 84TH STREET						
			35F+26	-	38F+90	RT/LT	2,281	
			39F+93	-	42F+81	RT/LT	2,170	
		W. KEARNEY STREET						
			136KE+50	-	144KE+78	RT/LT	1,824	
		SUBTOTAL					80,527	
		MAINLINE						
1000	5	IH 94 EB						
			278EW+87	-	284EW+71	RT	1,560	EXISTING IH 94 WB
			286EW+86	-	291EW+59	RT	470	EXISTING IH 94 WB
			293EW+22	-	296EW+90	RT	367	EXISTING IH 94 WB
		RAMPS						
		RAMP NSB						
			14NSB+00	-	21NSB+45	RT/LT	84	
		RAMP NEA						
			0NEA+00	-	16NEA+50	RT/LT	1,066	
		RAMP NEB						
			0NEB+00	-	11NEB+18	RT/LT	590	
		RAMP FCB						
			10FCB+00	-	45FCB+93	RT/LT	562	
		SUBTOTAL					4,699	
		TOTAL					289,718	

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Revised Sheet 1497
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REMOVING CONCRETE SIDEWALK

CATEGORY	STAGE	ROADWAY	STATION		STATION	OFFSET	204.0155 REMOVING CONCRETE SIDEWALK SY	
		LOCAL ROADS						
1000	1	W. BLUEMOUND ROAD						
			191BL+20	-	191BL+87	RT	49	
			191BL+20	-	191BL+79	LT	40	
			192BL+18	-	195BL+18	LT	193	
			192BL+33	-	194BL+23	RT	107	
			194BL+23	-	195BL+21	RT	76	2
			195BL+21	-	195BL+77	RT	34	
			197BL+90	-	199BL+13	RT	83	
			198BL+19	-	202BL+14	LT	226	
			199BL+13	-	202BL+67	RT	248	2
			202BL+24	-	202BL+44	LT	14	
			202BL+99	-	205BL+53	RT	197	
		W. WISCONSIN AVENUE						
			UTILITY WORK			LT	16	
		N. 95TH STREET						
			36TRS+13	-	37TRS+05	LT	51	
			36TRS+65	-	36TRS+97	RT	16	
			37TRS+29	-	38TRS+67	LT	76	
			38TRS+00	-	38TRS+03	RT	3	
		S. 84TH STREET						
			42F+71	-	48F+43	RT/LT	270	
		W. CHESTER STREET						
			50CH+87	-	50CH+92	LT	3	
			53CH+41	-	54CH+11	RT/LT	104	
		SUBTOTAL					1,806	2
		RAMPS						
1000	2	RAMP FA						
			738FA+09	-	743FA+14	LT	506	
		RAMP FD						
			736FD+79	-	737FD+23	RT/LT	120	
		RAMP TMD						
			785TMD+85	-	786TMD+11	RT	28	
			786TMD+17	-	786TMD+33	LT	13	
			786TMD+86	-	786TMD+95	LT	10	
			786TMD+88	-	787TMD+00	RT	12	
		LOCAL ROADS						
		SCHLINGER AVE						
			526SCH+68	-	529SCH+90	RT	234	
		W. BLUEMOUND ROAD						
			202BL+90	-	205BL+35	LT	179	
		N. 97TH STREET						
			322NS+97	-	323NS+37	LT	28	
			323NS+30	-	324NS+42	LT	62	

REMOVING CONCRETE SIDEWALK (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION		STATION	OFFSET	204.0155 REMOVING CONCRETE SIDEWALK SY
1000	2	N. 95TH STREET					
			40TRN+17	-	40TRN+22	RT	4
			40TRN+61	-	40TRN+65	RT	3
			43TRN+63	-	43TRN+67	RT	4
			45TRN+44	-	45TRN+47	RT	5
			46TRN+71	-	46TRN+76	RT	3
		W. CHESTER STREET					
			44CH+66	-	49CH+55	LT	306
			50CH+43	-	820FH+91	RT/LT	791
		S. 92ND STREET					
			66TJ-13	-	68TJ+84	RT/LT	389
		S. 84TH STREET					
			42F+71	-	48F+43	RT/LT	365
		W. O'CONNOR STREET					
			543CR+16	-	544CR+50	LT	88
			544CR+82	-	548CR+22	LT	209
			548CR+63	-	548CR+81	LT	10
			578CR+54	-	583CR+39	LT	262
		SUBTOTAL					3,631
		LOCAL ROADS					
1000	3	W. ADLER STREET					
			985AD+35	-	995AD+00	RT	472
			995AD+99	-	1022AD+66	RT	1,609
		S. 92ND STREET					
			61TJ+87	-	63TJ+26	RT/LT	180
		SUBTOTAL					2,261
		RAMPS					
1000	4	RAMP FB					
			738FB+25	-	741FB+70	RT	536
		RAMP FC					
			836FC+39	-	836FC+91	RT	55
		LOCAL ROADS					
		W. ADLER STREET					
			1022AD+15	-	1023AD+79	RT	122
		S. 92ND STREET					
			63TJ-61	-	64TJ+04	RT/LT	68
		S. 84TH STREET					
			35F+25	-	42F+81	RT/LT	1,018
		W. KEARNEY STREET					
			140KE+30	-	146KE+24	RT	328
		SUBTOTAL					2,127
		TOTAL					9,825

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ID 1060-33-80
Revised Sheet 1500
August 12, 2014

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	MISCELLANEOUS QUANTITIES	SHEET: 1500	E

REMOVING CONCRETE BARRIER

CATEGORY	STAGE	ROADWAY	FROM STATION	FROM OFFSET	TO STATION	TO OFFSET	204.0157 REMOVING CONCRETE BARRIER LF
		MAINLINE					
1000	1	IH 45/894 NB					
			315NS+19	8' RT	320NS+00	44' LT	484
			320NS+00	44' LT	329NS+07	135' RT	915
			320NS+58	14' RT	325NS+01	46' RT	446
			332NS+61	185' RT	333NS+40	196' RT	80
		IH 45/894 SB					
			313NS+63	22' RT	320NS+00	49' LT	640
			318NS+22	102' LT	320NS+00	112' LT	179
			320NS+00	111' LT	325NS+65	87' LT	566
			320NS+00	48' LT	329NS+08	47' LT	916
		IH 94 EB					
			241EW+64	104' RT	243EW+91	59' RT	240
			243EW+20	17' RT	248EW+35	30' LT	516
			251EW+38	30' LT	259EW+30	7' RT	790
			269EW+02	19' RT	280EW+22	1' RT	1,120
		IH 94 WB	241EW+99	33' RT	248EW+34	33' LT	638
			251EW+38	34' LT	259EW+30	3' RT	790
			269EW+02	15' RT	280EW+22	2' LT	1,120
		RAMPS					
		RAMP FA					
			743FA+97	5' RT	748FA+41	1' LT	445
		SUBTOTALS					9,885
		MAINLINE					
1000	2	IH 45/894 NB					
			280NS+89	27' RT	284NS+89	69' RT	397
			283NS+10	143' RT	285NS+30	190' RT	221
			283NS+91	94' RT	285NS+05	96' RT	114
			283NS+89	98' RT	285NS+24	96' RT	138
			329NS+07	52' RT	333NS+84	142' RT	486
		IH 45/894 SB					
			315NS+60	73' LT	318NS+22	102' LT	263
			334NS+84	293' LT	339NS+17	129' RT	475
		IH 94 EB					
			137EW+76	63' LT	146EW+80	56' LT	917
			153EW+75	1' LT	154EW+58	7' LT	83
			157EW+98	77' LT	160EW+89	84' LT	293
			165EW+97	28' LT	176EW+65	152' RT	1,100
			169EW+46	64' LT	176EW+81	85' RT	752
			209EW+13	90' RT	210EW+07	90' RT	94

REMOVING CONCRETE BARRIER (CONTINUED)

CATEGORY	STAGE	ROADWAY	FROM STATION	FROM OFFSET	TO STATION	TO OFFSET	204.0157 REMOVING CONCRETE BARRIER LF
1000	2	IH 94 WB					
			137EW+76	71' LT	146EW+80	60' LT	918
			157EW+96	82' LT	160EW+89	89' LT	293
			169EW+46	67' LT	174EW+72	5' LT	524
			202EW+72	158' LT	207EW+41	59' LT	479
			242EW+76	46' LT	245EW+54	80' LT	276
			248EW+32	105' LT	256EW+04	75' LT	757
			274EW+31	63' LT	276EW+13	71' LT	182
			279EW+27	61' LT	285EW+23	62' LT	601
		RAMPS					
		RAMP SW					
			576SW+65	108' RT	585SW+36	78' LT	891
			588SW+16	36' LT	589SW+86	13' LT	179
			588SW+20	66' LT	589SW+97	24' LT	190
		RAMP NW					
			476NW+62	146' RT	479NW+41	142' RT	308
		RAMP EN					
			201EW+65	189' LT	202EW+72	158' LT	111
		RAMP FA					
			743FA+98	25' RT	745FA+65	32' RT	173
		SUBTOTALS					11,215
		MAINLINE					
1000	3	IH 45/894 NB					
			276NS+00	18' LT	279NS+51	9' RT	343
			277NS+88	65' RT	279NS+57	83' RT	171
			311NS+03	125' RT	315NS+19	8' RT	435
			329NS+07	52' RT	333NS+84	142' RT	486
		IH 45/894 SB					
			329NS+08	47' LT	333NS+85	135' RT	485
		IH 94 EB					
			165EW+88	92' LT	169EW+46	64' LT	350
			206EW+77	4' LT	232EW+00	61' RT	2,509
			248EW+35	30' LT	251EW+38	30' LT	302
			280EW+22	1' RT	285EW+09	2' RT	487
		IH 94 WB					
			165EW+88	97' LT	169EW+46	67' LT	350
			207EW+41	59' LT	212EW+78	33' LT	455
			208EW+68	19' RT	232EW+00	57' RT	2,387
			238EW+58	7' RT	242EW+76	46' LT	420
			248EW+35	33' LT	251EW+38	34' LT	302
			280EW+25	2' LT	285EW+09	2' LT	485
		SUBTOTALS					9,967

REMOVING CONCRETE BARRIER (CONTINUED)

CATEGORY	STAGE	ROADWAY	FROM STATION	FROM OFFSET	TO STATION	TO OFFSET	204.0157 REMOVING CONCRETE BARRIER LF
		MAINLINE					
1000	4	IH 45/894 NB					
			264NS+99	24' LT	275NS+99	18' LT	1,107
			297NS+41	82' LT	298NS+39	63' LT	100
			298NS+01	18' LT	298NS+96	6' RT	97
			300NS+75	15' LT	310NS+03	17' RT	941
			306NS+75	162' RT	310NS+17	88' RT	355
		IH 45/894 SB					
			265NS+63	29' LT	272NS+73	28' LT	719
			310NS+03	17' RT	315NS+60	73' LT	563
			310NS+17	88' RT	313NS+64	22' RT	356
		IH 94 EB					
			220EW+10	110' RT	225EW+16	119' RT	507
			232EW+00	61' RT	243EW+20	17' RT	1,136
			238EW+71	138' RT	241EW+59	105' RT	298
			259EW+30	7' RT	269EW+02	19' RT	1,022
			272EW+95	63' RT	274EW+41	69' RT	147
			284EW+36	61' RT	284EW+80	63' RT	42
		IH 94 WB					
			232EW+00	57' RT	241EW+99	33' RT	1,013
			259EW+30	3' RT	269EW+02	15' RT	1,021
		RAMPS					
		RAMP NW					
			489NW+31	167' RT	489NW+49	171' RT	21
		SUBTOTALS					9,445
1000	5	IH 94 EB					
			286EW+86	3' RT	291EW+59	3' RT	472
			293EW+22	3' RT	296EW+90	3' RT	368
			302EW+18	3' RT	302EW+21	3' RT	103
		IH 94 WB					
			294EW+48	3' LT	295EW+51	3' LT	103
			302EW+18	3' RT	302EW+21	3' LT	103
		SUBTOTALS					1,149
		TOTALS					41,661

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REMOVING CRASH BARRELS

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	204.9060.S.0001 REMOVING CRASH BARRELS EACH
		MAINLINE				
1000	3	IH 45/894 NB	283NS+35	-	283NS+89	1
		SUBTOTAL				1
		MAINLINE				
1000	4	IH 45/894 NB	298NS+40	-	298NS+95	1
		SUBTOTAL				1
		TOTAL				2

REMOVING NOISE BARRIER

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.9090.S.0001 REMOVING NOISE BARRIER LF
		MAINLINE					
1000	1	IH 94 WB	243EW+80	-	256EW+04	LT	1,198
		SUBTOTAL					1,198
		MAINLINE					
1000	2	IH 94 WB	238EW+59	-	245EW+54	LT/RT	697
		SUBTOTAL					697
		TOTAL					1,895

REMOVING RETAINING WALL

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	204.9090.S.0002 REMOVING RETAINING WALL LF
1000							
	2	RAMP FC	798FC+75	-	806FC+68	LT	802
		TOTAL					802

1

REMOVING DECORATIVE FENCE

CATEGORY	STAGE	ROADWAY	FROM STATION	OFFSET	TO STATION	OFFSET	204.9090.S.0003 REMOVING DECORATIVE FENCE LF
1000	2	HONEY CREEK CORPORATION CENTER					
			55CH+63	15' RT	55CH+75	15' RT	12
			56CH+26	15' RT	56CH+72	16' RT	46
		TOTAL					58

REMOVING HIGH MAST LIGHTING TOWER ITEMS

CATEGORY	STAGE	ROADWAY	DESCRIPTION	STATION	SPV.0060.0010 REMOVING HIGH MAST LIGHTING TOWER CONCRETE BASE EACH	SPV.0060.0011 REMOVING HIGH MAST LIGHTING TOWER EACH
		TEMPORARY ROADS				
1000	2	RAMP EWB				
			HML-40-131	28EWB+80	2	1
		RAMP NEA				
			HML-40-138	11NEA+59	2	1
		SUBTOTALS			4	2
		TEMPORARY ROADS				
1000	3	RAMP NEA				
			HML-40-095	5NEA+03	1	1
		SUBTOTALS			1	1
		TOTALS			5	3

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PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	MISCELLANEOUS QUANTITIES	SHEET: 1504	E

SAWING

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	690.0150 SAWING ASPHALT LF	690.0250 SAWING CONCRETE LF	COMMENTS
		MAINLINE							
1000	1	IH 45/894 NB							
			311NS+20	-	320NS+00	RT	--	918	
			315NS+26	-	320NS+00	LT/RT	--	475	
			320NS+00	-	333NS+42	185' RT	--	1,377	
			320NS+00	-	327NS+61	LT/RT	--	811	
			321NS+15	-	321NS+45	LT	17	101	PROPOSED WATERMAIN TRENCH (2)
			334NS+01			346' RT	--	19	
		IH 45/894 SB							
			313NS+63	-	320NS+00	LT/RT	--	640	
			317NS+49	-	319NS+23	LT	174	--	ZOOFARI PARKING LOT
			318NS+23	-	320NS+00	LT	--	177	
			320NS+00	-	329NS+10	LT/RT	--	936	
			321NS+15	-	321NS+45	LT	--	119	PROPOSED WATERMAIN TRENCH
			342NS+17	-	343NS+53	145' LT	143	--	GE PARKING LOT
		IH 94 EB							
			245EW+24	-	261EW+51	71' RT	--	4,566	
			254EW+88	-	255EW+61	5' RT	83	--	
			254EW+88	-	258EW+45	5' RT	--	367	
			258EW+45	-	258EW+90	14' RT	45	--	
			261EW+42	-	261EW+42	14' RT	--	10	
			261EW+42	-	261EW+42	24' RT	10	--	
			261EW+42	-	261EW+42	33' RT	--	46	
			261EW+47	-	261EW+47	14' RT	--	10	
			261EW+47	-	261EW+47	24' RT	10	--	
			261EW+47	-	261EW+47	33' RT	--	46	
			261EW+47	-	262EW+13	33' RT	75	--	
			273EW+50	-	274EW+60	24' RT	129	--	
			275EW+89	-	276EW+00	24' RT	28	--	
			275EW+89	-	276EW+00	24' RT	28	--	
			277EW+30	-	280EW+22	5' RT	307	--	
			302EW+63	-	302EW+76	3' RT	23	--	
		IH 94 WB							
			255EW+60	-	255EW+60	20' LT	11	--	
			255EW+75	-	255EW+76	20' LT	11	--	
			258EW+59	-	259EW+05	4' LT	47	--	
			259EW+05	-	276EW+12	5' LT	--	1,754	
			276EW+12	-	280EW+22	5' LT	421	--	
		RAMPS							
		RAMP NW							
			492NW+08	-	495NW+43	38' LT	--	332	
		LOCAL ROADS							
		W. BLUEMOUND ROAD							
			191BL+20			LT/RT	--	72	
			193BL+27	-	193BL+66	80' RT	40	--	DRIVEWAY
			193BL+49	-	193BL+64	62' LT	15	--	DRIVEWAY
			194BL+96	-	195BL+01	61' LT	--	5	SIDEWALK
			200BL+82	-	200BL+91	72' RT	--	8	SIDEWALK
			205BL+66	-	205BL+82	LT/RT	--	89	
		W. WISCONSIN AVENUE							
			UTILITY WORK			LT/RT	--	256	

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(CONTINUED ON NEXT SHEET)

SAWING (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	690.0150 SAWING ASPHALT LF	690.0250 SAWING CONCRETE LF	COMMENTS
1000	1	ZOOFARI DRIVE							
			49XJ+22			LT/RT	--	37	
		N. 98TH STREET							
			191BL+81	-	192BL+18	69' LT	--	37	
		N. 97TH STREET							
			UTILITY WORK			LT/RT	--	265	
			UTILITY WORK			LT/RT	--	42	
		N. 95TH STREET							
			35TRS+86			LT/RT	--	31	
			36TRS+49	-	38TRS+69	35' LT	185	--	ST. THERESE CONGREGATION PARKING LOT
			UTILITY WORK			LT/RT	--	68	
		W. ADLER STREET							
			UTILITY WORK			LT	712	4,822	
		W. CHESTER STREET							
			50CH+86	-	52CH+10	41' LT	--	66	DRIVEWAY AND ALLEY
			53CH+42	-	54CH+11	24' LT	--	43	
			54CH+28	-	55CH+43	106' LT	116	--	
			55CH+68	-	55CH+15	18' RT	46	--	
			59CH+97	-	59CH+89	LT/RT	48		
			59CH+93			LT	--	5	
			820FH+63	-	820FH+91	LT/RT	--	27	HC PARKING LOT
			UTILITY WORK			LT/RT	1,483	27	
		S. 87TH PLACE							
			UTILITY WORK			RT	--	573	
		S. 87TH STREET							
			UTILITY WORK			RT	--	601	
		S. 86TH STREET							
			UTILITY WORK			RT	--	433	
		S. 84TH STREET							
			45F+25	-	46F+33	LT/RT	--	113	
			46F+75	-	48F+43	LT/RT	--	196	
			48F+43	-	48F+43	LT/RT	--	25	
			UTILITY WORK			LT/RT	--	271	
		BOX CULVERT B-40-93 EXISTING BOX CULVERT							
			2FCV+19	-	2FCV+81	LT/RT	--	131	
		SUBTOTALS					4,207	20,947	
								2	
		MAINLINE							
1000	2	IH 45/894 NB							
			293NS+33	-	293NS+43	LT	--	27	
			296NS+75	-	296NS+95	RT	--	26	
			334NS+03			365' RT	--	27	
		IH 45/894 SB							
			315NS+60	-	319NS+08	LT	--	366	

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SAWING (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	OFFSET	690.0150 SAWING ASPHALT LF	690.0250 SAWING CONCRETE LF	COMMENTS
1000	4		36F+22	-	36F+77	80' RT	--	54	
			37F+61	-	38F+68	RT	108	--	
			39F+13	-	39F+71	RT	58	--	
			40F+62	-	42F+48	LT/RT	--	235	
		W. ADLER STREET							
			1011AD+80	-	1015AD+40	LT	--	374	
		W. KEARNEY STREET							
			136KE+50	-	140KE+30	LT/RT	--	405	
			140KE+30	-	146KE+24	RT	--	10	SIDEWALK
		SUBTOTALS					166	4,141	
		TOTALS					5,307	47,431	

2

1060-33-80 - ZOO INTERCHANGE CORE, PHASE I

CATEGORY	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	SPV.0060.0015 REMOVING UTILITY VAULT EACH	SPV.0090.0014 REMOVING STEEL PIPE LF	SPV.0090.0015 REMOVING WATER PIPE LF	SPV.0090.0016 REMOVING CONCRETE ENCASED DUCT BANK LF
1000	USH 45									
		314NS+18	69' LT	-	314NS+21	48' LT	--	22	--	--
		314NS+37	84' RT	-	314NS+49	176' RT	--	93	--	--
	SUBTOTAL						--	115	--	--
	W. BLUEMOUND ROAD									
		194BL+82	18' LT	-	195BL+98	97' LT	--	--	--	171
		194BL+86	13' RT	-	195BL+80	43' RT	--	--	--	93
		195BL+93	78' RT	-	197BL+43	81' RT	--	150	--	--
		197BL+94	46' RT	-	198BL+60	43' RT	--	--	--	67
	SUBTOTAL						--	150	--	331
	W. WISCONSIN AVENUE									
		26WX+70	76' LT	-	28WX+99	76' LT	--	229	--	--
		28WX+40	34' LT	-	28WX+54	34' LT	--	14	--	--
		31WX+10	34' LT	-	31WX+24	34' LT	--	14	--	--
	SUBTOTAL						--	257	--	--

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August 12, 2014

(CONTINUED ON NEXT SHEET)

Division	From/To Station			Location	205.0100 Excavation Common (CY) (1)	SPV. 0035.0100 EBS Excavation (CY) (3)	Salvaged/ Unusable Pavement Material	Available Material (4)	SPV. 0035.0101 EBS Backfill (CY) (3)	Unexpanded Fill (5)	Expanded Fill (6)	Mass Ordinate +/- (7)	Waste (8)	Borrow	Comment:
					Cut (2)				Factor 1.00		Factor 1.20			Item 208.0100	
1				MAINLINE											
	317+04	TO	324+97	USH 45 NB R-40-557	4,399	62	0	4,399	62	16,046	19,255	-14,857	-14,857	0	2
	340+33	TO	346+55	USH 45 SB	3,353	47	0	3,353	47	57	69	3,284	3,284	0	
				RAMPS											
	575+86	TO	579+56	SW	758	11	0	758	11	6,574	7,889	-7,131	-7,131	0	
	723+77	TO	724+59	BA	303	4	0	303	4	21	25	279	279	0	
	746+46	TO	749+42	WC	522	7	0	522	7	8	9	513	513	0	
	570+00	TO	574+75	SA	11	0	0	11	0	4,457	5,348	-5,338	-5,338	0	
				LOCAL											
	191+20	TO	205+82	W. BLUEMOUND ROAD	11,385	159	3,600	7,785	159	1,755	2,106	5,678	5,678	0	
	35+86	TO	38+87	N. 95TH STREET (TRS)	1,007	14	254	753	14	0	0	753	753	0	
	39+80	TO	49+36	N. 95TH STREET (TRN)	3,642	51	1,308	2,334	51	1,444	1,733	601	601	0	
	42+81	TO	48+43	S. 84TH STREET	2,889	40	637	2,252	40	277	333	1,919	1,919	0	
				TEMPORARY											
	28+23	TO	29+38	NSA	378	5	0	378	5	0	0	378	378	0	
	10+00	TO	32+46	NSC	54,383	761	1,186	53,197	761	180	216	52,981	52,981	0	2
	10+00	TO	25+58	NSE	3,613	51	1,740	1,873	51	1	1	1,872	1,872	0	
	10+04	TO	30+21	EWK	2,000	28	770	1,230	28	360	432	798	798	0	
	11+80	TO	27+58	EWL	1,663	23	1,259	404	23	0	0	404	404	0	
				GRADING											
	2+72	TO	6+12	FCV	2,494	35	0	2,494	35	0	0	2,494	2,494	0	
	728+25	TO	730+50	RAMP BA GRADING	2,166	0	50	2,116	0	0	0	2,116	2,116	0	
															2
Division 1 Subtotal Stage 1					94,963	1,299	10,804	84,159	1,299	31,180	37,416	46,743	46,743	0	
2				MAINLINE											
	221+50	TO	228+74	USH 45 SB	509	7	0	509	7	11,868	14,242	-13,733	-13,733	0	
	288+27	TO	299+00	USH 45 NB	5,898	83	0	5,898	83	20,506	24,608	-18,709	-18,709	0	
	303+00	TO	307+32	USH 45 NB	1,129	16	0	1,129	16	0	0	1,129	1,129	0	
	304+45	TO	320+00	USH 45 SB	1,634	23	153	1,481	23	13,359	16,031	-14,550	-14,550	0	
	320+00	TO	349+00	USH 45 SB	71,458	1,000	493	70,965	1,000	19,422	23,306	47,659	47,659	0	
	147+00	TO	304+70	IH 94 EB	9,284	130	97	9,187	130	3,619	4,343	4,844	4,844	0	
	209+83	TO	297+50	IH 94 WB	55,217	773	923	54,294	773	27,347	32,816	21,478	21,478	0	
				RAMPS											
	592+63	TO	596+09	SW	6	0	0	6	0	12,748	15,298	-15,292	-15,292	0	
	477+08	TO	494+55	NW	1,308	23,099	547	761	23,099	45,450	54,540	-53,779	-53,779	0	
	514+22	TO	518+29	EN	7,563	106	0	7,563	106	2	3	7,560	7,560	0	

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(CONTINUED)

Division	From/To Station			Location	205.0100 Excavation Common (CY) (1)	SPV. 0035.0100 EBS Excavation (CY) (3)	Salvaged/ Unusable Pavement Material	Available Material (4)	SPV. 0035.0101 EBS Backfill (CY) (3)	Unexpanded Fill (5)	Expanded Fill (6)	Mass Ordinate +/- (7)	Waste (8)	Borrow	Comment:
					Cut (2)				Factor 1.00		Factor 1.20			Item 208.0100	
2	521+88	TO	537+85	NE	10,871	8,205	923	9,948	8,205	21,900	26,280	-16,332	-16,332	0	
	768+01	TO	779+76	GD R-40-525	0	0	0	0	0	13,834	16,601	-16,601	-16,601	0	
	822+48	TO	823+32	BB	206	3	0	206	3	0	0	206	206	0	
	702+68	TO	721+93	BC	316	2,408	0	316	2,408	6,220	7,464	-7,148	-7,148	0	
	723+01	TO	731+70	BD	14,149	198	692	13,457	198	3,260	3,912	9,545	9,545	0	
	746+46	TO	749+44	WC	4,255	60	0	4,255	60	3	3	4,252	4,252	0	
	738+09	TO	750+74	FA	5,016	70	814	4,202	70	1,735	2,082	2,120	2,120	0	
	801+60	TO	825+05	FC	33,427	468	987	32,440	468	2	3	32,437	32,437	0	
	722+25	TO	737+00	FD	11,816	165	0	11,816	165	2,758	3,309	8,507	8,507	0	
	719+00	TO	722+82	FG	1,046	15	0	1,046	15	0	0	1,046	1,046	0	
	802+35	TO	826+34	FH	41,429	580	378	41,051	580	62	74	40,977	40,977	0	
	773+20	TO	789+75	TMD	10,725	150	2,582	8,143	150	969	1,163	6,980	6,980	0	
												0			
				LOCAL											
	31+73	TO	37+21	S. 100TH STREET	125	2	0	125	-124	305	365	-240	-240	0	
	38+94	TO	41+20	N. 97TH STREET	330	5	216	114	-110	22	26	88	88	0	
	983+30	TO	1022+66	W. ADLER STREET	3,240	45	60	3,180	45	110	132	3,048	3,048	0	
	43+30	TO	55+45	W.CHESTER STREET	2,751	39	60	2,691	39	69	83	2,608	2,608	0	
	55+45	TO	59+97	HONEY CREEK W. ACCESS DR.	831	12	0	831	12	1,489	1,787	-956	-956	0	
	66+72	TO	69+06	S. 92ND STREET	1,164	16	752	412	16	4	5	408	408	0	
	42+81	TO	48+43	S. 84TH STREET	3,163	44	696	2,468	44	14	16	2,451	2,451	0	
	543+16	TO	583+16	W. O'CONNOR STREET	4,421	62	1,099	3,322	62	93	111	3,211	3,211	0	
				TEMPORARY											
	15+13	TO	37+50	EWB	5,181	73	1,004	4,177	73	23,195	27,833	-23,656	-23,656	0	
	168+50	TO	174+42	EWC	1,045	15	297	748	15	98	117	631	631	0	
	10+00	TO	24+79	EWD	19,763	277	1,059	18,704	277	906	1,087	17,617	17,617	0	
	10+56	TO	17+03	EWE	2,255	32	195	2,060	32	2	2	2,057	2,057	0	
	11+41	TO	21+98	EWH	3,935	55	387	3,548	55	1,403	1,684	1,864	1,864	0	
	11+69	TO	20+89	EWI	2,794	39	958	1,836	39	0	0	1,836	1,836	0	
	0+00	TO	10+86	NEB	2,956	41	329	2,627	41	26	31	2,596	2,596	0	
	10+00	TO	15+13	WCA	2,472	35	108	2,364	35	369	443	1,922	1,922	0	
	10+00	TO	15+60	SLB	985	14	99	886	14	1,261	1,513	-627	-627	0	
	10+00	TO	45+90	FCB	41,184	577	222	40,962	577	1,071	1,285	39,677	39,677	0	
	10+00	TO	14+15	FDB	421	6	62	359	6	31	37	322	322	0	
	18+18	TO	23+16	NWA	701	10	272	429	10	50	60	369	369	0	
				GRADING											
	6+12	TO	8+12	FCV	4,171	58		4,171	58	0	0	4,171	4,171	0	
	724+50	TO	733+85	RAMP BA GRADING	20	0		20	0	42,002	50,403	-50,383	-50,383	0	
	335+50	TO	342+40	USH 45 NB GRADING	2	0	0	2	0	15,686	18,823	-18,821	-18,821	0	
	88+00	TO	111+60	IH 94 EB/WB GRADING	0	0	0	0	0	32,131	38,557	-38,557	-38,557	0	
	178+85	TO	186+35	IH 94 CORE GRADING	59,188	829	473	58,715	829	221	265	58,449	58,449	0	2
	188+03	TO	192+25	IH 94 PIER GRADING	17,177	240	0	17,177	240	0	0	17,177	17,177	0	

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(CONTINUED)

Division	From/To Station			Location	205.0100 Excavation Common (CY) (1)	SPV. 0035.0100 EBS Excavation (CY) (3)	Salvaged/ Unusable Pavement Material	Available Material (4)	SPV. 0035.0101 EBS Backfill (CY) (3)	Unexpanded Fill (5)	Expanded Fill (6)	Mass Ordinate +/- (7)	Waste (8)	Borrow	Comment:
					Cut (2)				Factor 1.00		Factor 1.20			Item 208.0100	
2	524+86	TO	529+43	RAMP EN BERM	35	0	0	35	0	15,187	18,224	-18,189	-18,189	0	
Division 2 Subtotal Stage 2					467,573	40,083	16,937	450,636	39,843	340,807	408,968	41,668	41,668	2 0	
3				MAINLINE											
	276+00	TO	288+27	USH 45 NB	16,252	228	1,286	14,967	228	6,344	7,612	7,355	7,355	0	
	331+63	TO	352+80	USH 45 SB	48,332	677	261	48,071	677	25	31	48,040	48,040	0	
	208+00	TO	243+00	IH 94 EB	26,280	368	5,497	20,783	368	9,156	10,987	9,797	9,797	0	
	208+00	TO	284+92	IH 94 WB	43,601	610	12,839	30,762	610	12,437	14,925	15,837	15,837	0	
				RAMPS											
	564+81	TO	598+95	SW	959	13	854	105	13	16,995	20,395	-20,290	-20,290	0	
	561+55	TO	582+26	NE	14,636	205	46	14,590	205	2,015	2,419	12,172	12,172	0	
	731+70	TO	733+60	BD	4,608	65	0	4,608	65	0	0	4,608	4,608	0	
	749+00	TO	753+07	WC	511	7	0	511	7	0	0	511	511	0	
	548+50	TO	563+28	SA	12,464	175	1,743	10,722	175	935	1,121	9,600	9,600	0	
				LOCAL											
	983+30	TO	1022+66	W. ADLER STREET	4,851	68	3,426	1,425	68	60	72	1,353	1,353	0	
	61+85	TO	63+33	S. 92ND STREET	674	9	580	94	9	3	4	91	91	0	
				TEMPORARY											
	15+99	TO	31+19	NSB	1,431	20	55	1,376	20	5,341	6,409	-5,033	-5,033	0	
	10+34	TO	16+01	EWJ	4,425	62	453	3,972	62	0	0	3,972	3,972	0	
	11+06	TO	15+89	EWM	0	0	0	0	0	3,770	4,523	-4,523	-4,523	0	
	11+95	TO	18+32	EWN	915	13	524	391	13	1	1	390	390	0	
	1+40	TO	16+50	NEA	2,371	33	313	2,058	33	2,742	3,290	-1,232	-1,232	0	
	12+07	TO	15+77	SAB	2,027	28	0	2,027	28	34	40	1,987	1,987	0	
	14+73	TO	23+28	SWB	2,916	41	711	2,205	41	0	0	2,205	2,205	0	
	8+12	TO	9+25	FCV	3,125	44		3,125	44	0	0	3,125	3,125	0	
Division 3 Subtotal Stage 3					190,378	2,665	28,587	161,792	2,665	59,858	71,829	89,963	89,963	0	
4				MAINLINE											
	299+00	TO	308+00	USH 45 NB	25,649	359	1,584	24,066	359	4	4	24,061	24,061	0	
	310+00	TO	320+00	USH 45 SB	18,113	254	1,343	16,770	254	0	0	16,770	16,770	0	
	320+00	TO	352+80	USH 45 SB	22,330	313	1,057	21,273	313	25	30	21,243	21,243	0	
	230+84	TO	284+71	IH 94 EB	47,309	662	12,107	35,202	662	24,116	28,940	6,263	6,263	0	
				RAMPS											
	480+00	TO	493+00	NW	616	9	649	-33	9	38,212	45,855	-45,888	-45,888	0	
	521+88	TO	582+25	NE	5,179	73	1,085	4,095	73	2,156	2,587	1,508	1,508	0	
	737+80	TO	758+24	FB	19,607	275	0	19,607	275	132	158	19,449	19,449	0	

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FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\030201_mq_pav.ppt PLOT DATE : 8/7/2014 11:02:24 AM PLOT BY : MSCCEJ PLOT NAME : 030201_mq_pav50 PLOT SCALE : 1:1

(CONTINUED)

Division	From/To Station			Location	205.0100 Excavation Common (CY) (1)	SPV. 0035.0100 EBS Excavation (CY) (3)	Salvaged/ Unusable Pavement Material	Available Material (4)	SPV. 0035.0101 EBS Backfill (CY) (3)	Unexpanded Fill (5)	Expanded Fill (6)	Mass Ordinate +/- (7)	Waste (8)	Borrow	Comment:
					Cut (2)				Factor 1.00		Factor 1.20			Item 208.0100	
4	822+56	TO	836+92	FC	8,818	123	0	8,818	123	4,953	5,943	2,874	2,874	0	
	718+56	TO	722+82	FG	819	11	0	819	11	0	0	819	819	0	
	773+03	TO	783+52	TMC	5,680	80	856	4,824	80	739	887	3,938	3,938	0	
				LOCAL											
	994+50	TO	1023+92	W. ADLER STREET	360	5	517	-157	5	22	27	-183	-183	0	
	63+33	TO	63+65	S. 92ND STREET	117	2	110	7	2	0	0	7	7	0	
	35+26	TO	42+81	S. 84TH STREET	6,656	93	1,683	4,973	93	229	275	4,698	4,698	0	
	136+50	TO	144+46	W. KEARNEY STREET	1,168	16	48	1,120	16	4	4	1,116	1,116	0	
				TEMPORARY											
	11+75	TO	22+17	NSF	2,353	33	554	1,799	33	530	636	1,163	1,163	0	
	17+60	TO	24+82	NSG	4,614	65	0	4,614	65	998	1,198	3,416	3,416	0	
	11+81	TO	14+00	NEC	874	12	0	874	12	0	0	874	874	0	
	11+19	TO	17+68	SWA	274	4	38	236	4	3,333	4,000	-3,764	-3,764	0	
	11+50	TO	16+49	WSA	616	9	58	558	9	715	857	-300	-300	2	0
	9+25	TO	13+48	FCV	8,336	117		8,336	117	0	0	8,336	8,336		0
Division 4 Subtotal Stage 4					179,491	2,513	21,689	157,802	2,513	76,168	91,402	66,400	66,400	2	0
5				MAINLINE											
	311+50	TO	314+00	USH 45 SB	2,326	33	0	2,326	33	110	132	2,194	2,194	0	
	230+58	TO	291+58	IH 94 EB	3,552	50	1,149	2,403	50	793	952	1,451	1,451	0	
				RAMPS											
	525+66	TO	528+90	NE	695	10	0	695	10	342	410	285	285	0	
Division 5 Subtotal Stage 5					6,573	92	1,149	5,424	92	1,245	1,494	3,930	3,930		0
Total					938,979	46,652	79,166	859,812	46,413	509,258	611,109	248,703	248,703	2	0

NOTES:

1) Common Excavation is the sum of the Cut and EBS Excavation columns. Item number 205.0100
2) Salvaged/Unsuable Pavement Material is included in Cut.
3) EBS Excavation SPV.00350100 (CY) to be backfilled with EBS Backfill SPV.0035.0101 (CY). EBS Excavation volume assumed as 5% of total roadway area at an average depth of 18-inches, in addition to locations shown in plans. All EBS Excavation to be wasted offsite. EBS Backfill Factor = 1.00.
   Actual extents and depths of EBS Excavation will be determined by the engineer in the field.
4) Available Material = Cut - Salvaged/Unusable Pavement Material
5) The backfill needed to construct the mechanically stabilized earth walls has been estimated. The MSE backfill quantity has been subtracted from the fill volume in all end area calculations.
   The width of the MSE backfill off of the back of the MSE wall has been estimated as 0.8 times the height of the retaining walls.
6) Expanded Fill. Factor = 1.20 Expanded Fill = Unexpanded Fill * Fill Factor
7) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material within the Division. Minus indicates a shortage of material within the Division.
8) The storm sewer excavation is estimated to be between 125,000 and 175,000 cubic yards dependant on the means and methods used to construct the storm sewer.
   This quantity is not included in this table and should be considered additional waste and is incidental to the storm sewer items.

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BASE AGGREGATE ITEMS

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	305.0120* BASE AGGREGATE DENSE 1 1/4-INCH TON	312.0115* SELECT CRUSHED MATERIAL CY
		MAINLINE					
1000	1	PROPOSED WATERMAIN TRENCH					
			321NS+15	-	321NS+45	296	182
							2
		IH 94					
			186EW+44	-	189EW+33	93	--
			254EW+87	-	280EW+23	4,983	--
		RAMPS					
		RAMP SA					
			571SA+97	-	572SA+21	15	--
			572SA+36	-	573SA+03	--	81
		LOCAL ROADS					
		W. BLUEMOUND RD					
			191BL+20	-	196BL+07	2,345	2,825
			198BL+71	-	205BL+82	3,049	3,704
		W. WISCONSIN AVENUE					
			UTILITY WORK			35	--
		N. 97TH STREET					
			UTILITY WORK			69	--
		N. 95TH STREET					
			35TRS+86	-	38TRS+88	649	--
			39TRN+80	-	48TRN+50	1,341	--
			UTILITY WORK			12	--
			48TRN+50	-	49TRN+36	321	--
		W. BURLEIGH STREET					
			UTILITY WORK			30	--
		W. ADLER STREET					
			UTILITY WORK			739	--
		87TH PLACE					
			UTILITY WORK			45	--
		87TH STREET					
			UTILITY WORK			44	--
		86TH STREET					
			UTILITY WORK			38	--
		S. 84TH STREET					
			42F+81	-	48F+43	1,573	1,382
		TEMPORARY ROADS					
		RAMP NSA					
			28NSA+23	-	29NSA+38	429	233

BASE AGGREGATE ITEMS (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	305.0120* BASE AGGREGATE DENSE 1 1/4-INCH TON	312.0115* SELECT CRUSHED MATERIAL CY
1000	1	RAMP NSC					
			10NSC+00	-	32NSC+46	9,343	5,376
		RAMP NSE					
			10NSE+00	-	25NSE+58	3,481	--
		RAMP EWK					
			10EWK+04	-	30EWK+21	3,272	--
		RAMP EWL					
			11EWL+80	-	27EWL+58	2,518	--
		SUBTOTAL				34,720	13,783
							2
		MAINLINE					
1000	2	IH 894/USH 45 NB					
			303NS+00	-	304NS+00	89	79
			304NS+50	-	307NS+32	189	168
			R-40-557				356
		IH 894/USH 45 SB					
			304NS+45	-	311NS+47	1,853	1,647
			319NS+09	-	320NS+00	193	171
			320NS+00	-	331NS+64	3,124	2,765
			338NS+00	-	349NS+00	5,383	4,678
			R-40-556				191
		IH 94 EB					
			147EW+00	-	162EW+00	5,503	4,699
			299EW+90	-	301EW+30	44	59
		IH 94 WB					
			209EW+83	-	236EW+47	7,741	6,801
			238EW+32	-	278EW+73	8,599	7,338
			278EW+73	-	285EW+25	2,273	1,284
			295EW+10	-	297EW+50	39	--
		RAMPS					
		RAMP SW					
			576SW+93	-	579SW+36	486	407
			593SW+01	-	595SW+89	892	777
		RAMP NW					
			477NW+09	-	494NW+55	2,868	2,296
		RAMP SE					
			516EN+00	-	522EN+60	1,208	743
		RAMP EN					
			514EN+21	-	518EN+31	785	698

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FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\030201_mq_pav.ppt PLOT DATE : 8/7/2014 10:30:51 AM PLOT BY : MSCCEJ PLOT NAME : 030201_mq_pav52 PLOT SCALE : 1:1

BASE AGGREGATE ITEMS (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	305.0120* BASE AGGREGATE DENSE 1 1/4-INCH TON	312.0115* SELECT CRUSHED MATERIAL CY
1000	4	IH 94 EB					
			230EW+84	-	236EW+70	2,058	1,823
			238EW+55	-	276EW+75	18,479	15,977
			276EW+75	-	284EW+87	3,592	2,045
			241EW+56	-	245EW+58	489	301
			244EW+15	-	258EW+59	2,436	1,499
			256EW+19	-	257EW+74	128	79
		IH 94 WB					
			243EW+00	-	258EW+00	1,404	1,216
		RAMPS					
		RAMP NE					
			521NE+87	-	525NE+66	329	293
			568NE+24	-	582NE+25	2,163	1,816
		RAMP FB					
			737FB+80	-	754FB+20	3,271	4,061
			754FB+20	-	758FB+24	908	807
		RAMP FC					
			822FC+57	-	836FC+92	2,328	3,043
		RAMP TMC					
			773TMC+03	-	776TMC+63	779	693
			776TMC+63	-	783TMC+52	904	1,194
		LOCAL ROADS					
		S. 92ND STREET					
			63TJ+33	-	63TJ+66	93	--
		W. ADLER STREET					
			994AD+50	-	995AD+03	82	--
			995AD+95	-	996AD+25	53	--
			1022AD+66	-	1023AD+79	279	--
							--
		S. 84TH STREET					
			35F+24	-	42F+81	3,172	3,446
		W. KEARNEY STREET					
			136KE+50	-	144KE+46	511	336
		TEMPORARY ROADS					
		RAMP FCB					
			26FCB+33	-	31FCB+38	855	326
		RAMP NSF					
			11NSF+75	-	22NSF+17	2,639	1,503

AGGREGATE UNIT WEIGHTS USED	
Base Aggregate Dense (TONS/CY)	2.0
Select Crushed Material (TONS/CY)	1.9

BASE AGGREGATE ITEMS (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	305.0120* BASE AGGREGATE DENSE 1 1/4-INCH TON	312.0115* SELECT CRUSHED MATERIAL CY
1000	4	RAMP NSG					
			27NSG+60	-	34NSG+82	2,260	1,036
		RAMP NEC					
			11NEC+81	-	14NEC+00	444	249
		RAMP SWA					
			11SWA+19	-	17SWA+68	1,280	678
		RAMP WSA					
			11WSA+50	-	16WS+53	1,421	711
		SUBTOTAL				66,844	54,890
		MAINLINE					
1000	5	IH 894/USH 45 SB					
			311NS+35	-	314NS+00	391	348
			343NS+90	-	346NS+50	381	305
		IH 94 EB					
			278EW+87	-	296EW+90	3,193	1,779
		RAMPS					
		RAMP NE					
			525NE+66	-	528NE+89	287	255
		SUBTOTAL				4,252	2,687
		TOTAL				278,884	191,091

* ADDITIONAL QUANTITIES FOUND ELSEWHERE

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PAVEMENT SUBGRADE IMPROVEMENT

CATEGORY	ROADWAY	209.0100* BACKFILL GRANULAR CY	312.0115* SELECT CRUSHED MATERIAL CY	SPV.0180.0800* GEOGRID REINFORCEMENT SY	SPV.0090.0126* PIPE UNDERDRAIN 6-INCH SPECIAL LF
1000	UNDISTRIBUTED	5,000	15,000	50,000	2,000
	TOTAL	5,000	15,000	50,000	2,000

* ADDITIONAL QUANTITIES FOUND ELSEWHERE

NOTE: ACTUAL LOCATIONS OF SUBGRADE IMPROVEMENT DEPENDENT ON FIELD CONDITIONS DURING GRADING OPERATIONS. ITEMS SHOWN SHALL NOT BE PLACED UNTIL AUTHORIZED BY THE ENGINEER.

ASPHALTIC ITEMS

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	455.0115 ASPHALTIC MATERIAL PG 64-22 TON	455.0120 ASPHALTIC MATERIAL PG 64-28 TON	455.0150 ASPHALTIC MATERIAL PG 70-28P TON	455.0605 TACK COAT GAL	460.1101 HMA PAVEMENT TYPE E-1 TON	460.1110 HMA PAVEMENT TYPE E-10 TON	460.1130 HMA PAVEMENT TYPE E-30 TON	460.2000 INCENTIVE DENSITY HMA PAVEMENT DOL	465.0105 ASPHALTIC SURFACE TON	465.0125 ASPHALTIC SURFACE TEMPORARY TON	465.0310 ASPHALTIC CURB LF
		MAINLINE														
1000	1	PROPOSED WATERMAIN TRENCH														
			321NS+15	-	321NS+45	--	--	--	10	--	--	--	--	--	172	--
																2
		IH 94 EB														
			186EW+44	-	189EW+33	--	3	--	4	--	56	--	--	--	--	--
			254EW+88	-	280EW+22	--	--	--	187	--	--	--	--	--	2,512	--
									--							
		LOCAL ROADS							--							
		N.97TH STREET							--							
			UTILITY WORK			--	--	--	2	--	--	--	--	--	27	80
									--							
		N. 95TH STREET							--							
			48TRN+36	-	49TRN+56	--	--	--	6	--	--	--	--	--	69	6
			UTILITY WORK			--	--	--	--	--	--	--	--	--	5	6
									--							
		W. BURLEIGH STREET							--							
			UTILITY WORK			--	--	--	--	--	--	--	--	--	20	--
									--							
		W. ADLER STREET							--							
			UTILITY WORK			--	--	--	48	--	--	--	--	--	535	--
									--							
		W. CHESTER STREET							--							
			UTILITY WORK			--	--	--	1	--	--	--	--	--	7	--
									--							
		S. 84TH STREET							--							
			42F+28	-	43F+34	--	--	--	10	--	--	--	--	--	112	--
			42F+42	-	42F+81	--	--	--	5	--	--	--	--	--	51	--
			47F+69	-	48F+43	--	--	--	3	--	--	--	--	--	36	--
									--							
		ZOO PARKING LOT							--							
			UTILITY WORK			--	--	--	4	--	--	--	--	--	40	--
									--							
		TEMPORARY ROADS							--							
		RAMP NSA							--							
			28NSA+23	-	29NSA+38	--	13	--	13	--	220	--	141	--	--	--
									--							
		RAMP NSC							--							
			10NSC+00	-	32NSC+46	--	305	--	302	--	5,080	--	3,251	--	--	--
									--							
		RAMP NSE							--							
			10NSE+00	-	25NSE+58	--	--	--	131	--	--	--	--	--	1,754	--
									--							
		RAMP EWK							--							
			10EWK+04	-	30EWK+21	--	--	--	107	--	--	--	--	--	1,442	--
									--							
		RAMP EWL							--							
			11EWL+80	-	27EWL+58	--	--	--	94	--	--	--	--	--	1,269	--
		SUBTOTAL				--	321	--	927	--	5,356	--	3,392	--	8,051	92
															2	
		MAINLINE														
1000	2	IH 894/ USH 45 SB														
			338NS+00	-	349NS+00	--	--	--	1	--	--	--	--	7	--	--

MATERIAL UNIT WEIGHTS USED		
HMA Pavement	112	LB/(SY*IN)

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ASPHALTIC ITEMS (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	455.0115 ASPHALTIC MATERIAL PG 64-22 TON	455.0120 ASPHALTIC MATERIAL PG 64-28 TON	455.0150 ASPHALTIC MATERIAL PG 70-28P TON	455.0605 TACK COAT GAL	460.1101 HMA PAVEMENT TYPE E-1 TON	460.1110 HMA PAVEMENT TYPE E-10 TON	460.1130 HMA PAVEMENT TYPE E-30 TON	460.2000 INCENTIVE DENSITY HMA PAVEMENT DOL	465.0105 ASPHALTIC SURFACE TON	465.0125 ASPHALTIC SURFACE TEMPORARY TON	465.0310 ASPHALTIC CURB LF
		MAINLINE														
1000	5	IH 94 EB														
			278EW+87	-	284EW+71	57	--	16	121	--	--	1,222	782	--	--	--
			284EW+71	-	285EW+07	--	--	1	4	--	--	18	--	--	--	--
			286EW+86	-	291EW+59	17	--	5	36	--	--	367	235	--	--	--
			286EW+77	-	291EW+59	--	--	14	52	--	--	234	--	--	--	--
									--							
		IH 94 WB							--							
			284EW+92	-	285EW+25	--	--	1	4	--	--	18	--	--	--	--
		SUBTOTAL				74	--	37	217	--	--	1,859	1,017	--	--	--
		TOTALS				361	1,842	116	3,716	779	30,710	7,183	24,198	234	13,602	871

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TEMPORARY SHORING

2

STAGE	ROADWAY	STATION	TO	STATION	OFFSET	511.1300.0020 TEMPORARY SHORING 320NS+00 to 322NS+00 SF	511.1300.0003 TEMPORARY SHORING 344NS+62 TO 346NS+00 SF	511.1300.0004 TEMPORARY SHORING 595SW+59 TO 595SW+78 SF	511.1300.0005 TEMPORARY SHORING 317NS+85 TO 318NS+20 SF	511.1300.0006 TEMPORARY SHORING 321NS+38 TO 323NS+97 SF	511.1300.0007 TEMPORARY SHORING 326NS+28 TO 327NS+14 SF	511.1300.0008 TEMPORARY SHORING 269EW+98 TO 279EW+44 SF	511.1300.0009 TEMPORARY SHORING 273EW+97 TO 279EW+25 SF	511.1300.0010 TEMPORARY SHORING 313NS+33 TO 318NS+00 SF
	MAINLINE													
1A	IH 894 / USH 45													
		344NS+62		346NS+00	RT	--	3,640	--	--	--	--	--	--	--
		320NS+50		322NS+00	RT	2497	--	--	--	--	--	--	--	--
	RAMPS													
	RAMP SW													
		595SW+59		595SW+78	LT	--	--	456	--	--	--	--	--	--
	MAINLINE													
1B	IH 894 / USH 45													
		317NS+85		318NS+20	LT	--	--	--	910	--	--	--	--	--
		321NS+38		323NS+97	RT	--	--	--	--	2,849	--	--	--	--
		326NS+28		327NS+14	LT	--	--	--	--	--	2,088	--	--	--
	IH 94													
		269EW+98		280EW+08	RT	--	--	--	--	--	--	12,120	--	--
		273EW+97		280EW+08	LT	--	--	--	--	--	--	--	7,332	--
	MAINLINE													
1C	IH 894 / USH 45													
		313NS+33		318NS+00	LT	--	--	--	--	--	--	--	--	12,064
	TOTALS					2,497	3,640	456	910	2,849	2,088	12,120	7,332	12,064

1

STAGE	ROADWAY	STATION	TO	STATION	OFFSET	511.1300.0001 TEMPORARY SHORING 24FCB+78 TO 32FCB+19 SF	511.1300.0002 TEMPORARY SHORING 41FCB+67 TO 45FCB+07 SF	511.1300.0011 TEMPORARY SHORING 232EW+65 TO 233EW+15 SF	511.1300.0012 TEMPORARY SHORING 233EW+76 TO 234EW+26 SF	511.1300.0013 TEMPORARY SHORING 152EW+14 TO 152EW+71 SF	511.1300.0014 TEMPORARY SHORING 802BB+15 TO 802BB+36 SF	511.1300.0015 TEMPORARY SHORING 802BB+16 TO 802BB+58 SF	511.1300.0016 TEMPORARY SHORING 802BB+58 TO 803BB+00 SF	511.1300.0017 TEMPORARY SHORING 802BB+80 TO 803BB+01 SF	511.1300.0018 TEMPORARY SHORING 7FCV+83 TO 9FCV+53 SF	511.1300.0019 TEMPORARY SHORING 9FCV+21 TO 10FCV+76 SF
	MAINLINE															
2A	IH 94															
		152EW+14		152EW+71	RT	--	--	--	--	1,026	--	--	--	--	--	--
		232EW+65		233EW+15	LT/RT	--	--	1,600	--	--	--	--	--	--	--	--
		233EW+76		234EW+26	LT	--	--	--	1,600	--	--	--	--	--	--	--
	RAMPS															
	RAMP FCB															
		24FCB+78		32FCB+19	LT	2,060	--	--	--	--	--	--	--	--	--	--
		41FCB+67		45FCB+07	LT	--	1,512	--	--	--	--	--	--	--	--	--
3A	B-40-93	7FCV+83		9FCV+53	LT/RT	--	--	--	--	--	--	--	--	--	1,405	--
	RAMPS															
4A	RAMP BB															
		802BB+15		802BB+36	LT	--	--	--	--	--	273	--	--	--	--	--
		802BB+16		802BB+58	RT	--	--	--	--	--	--	546	--	--	--	--
		802BB+58		803BB+00	LT	--	--	--	--	--	--	--	546	--	--	--
		802BB+80		803BB+01	RT	--	--	--	--	--	--	--	--	273	--	--
	B-40-93	9FCV+21		10FCV+76	LT/RT	--	--	--	--	--	--	--	--	--	--	1,210
	TOTALS					2,060	1,512	1,600	1,600	1,026	273	546	546	273	1,405	1,210

ALL ITEMS CATEGORY 1000

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FENCING ITEMS

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	616.0206 FENCE CHAIN LINK 6-FT LF	616.0208 FENCE CHAIN LINK 8-FT LF	616.0329.0001 GATES CHAIN LINK 8-FT EACH	616.0329.0002 GATES CHAIN LINK 12-FT EACH	616.0406 FENCE CHAIN LINK SALVAGED 6-FT LF	SPV.0090.0600 FENCE TEMPORARY 6-FT LF	SPV.0090.0602 FENCE TEMPORARY LEFT IN PLACE 6-FT LF	SPV.0090.0603 FENCE TEMPORARY LEFT IN PLACE 8-FT LF	SPV.0090.0604 FENCE CHAIN LINK SCREENING 6-FT LF
		MAINLINE												
1000	1	IH 894/USH 45												
			191NS+99	-	202NS+15	--	--	--	--	--	--	--	--	965
			312NS+77	-	321NS+82	--	--	--	--	--	--	921	--	--
			334NS+62	-	350NS+12	1,534	--	--	--	--	--	--	--	--
			20NSC+80	-	22NSC+88	--	--	--	--	--	220	--	--	--
			720BC+63	-	723BD+60	--	--	--	--	--	295	--	--	--
			DNR FORESTRY SITE			2,504	--	--	1	--	--	--	--	--
														2
		IH 94												
			274EW+23	-	275EW+71	--	--	--	--	--	150	--	--	--
			274EW+23	-	274EW+73	--	--	--	--	--	50	--	--	--
		RAMP BB												
			822BB+48	-	823BB+34	88	--	--	--	--	--	--	--	--
		RAMP BC												
			720BC+75	-	721BC+37	--	69	--	--	--	--	--	--	--
		RAMP FC												
			796FC+14	-	796FC+21	15	--	--	--	--	--	--	--	--
		RAMP FH												
			802FH+20	-	803FH+38	123	--	--	--	--	--	--	--	--
		LOCAL ROADS												
		N. 97TH STREET												
			723BD+60	-	48TF+32	--	--	--	--	--	--	--	--	880
		N. 95TH STREET												
			40TRN+05	-	49TRN+35	--	--	--	--	--	--	--	--	950
			40TRN+32	-	50TRN+54	1,055	--	1	--	--	--	196	--	--
		W. ADLER STREET												
			983AD+38	-	994AD+95	--	--	--	--	--	--	--	--	1,260
			995AD+93	-	1002AD+90	--	--	--	--	--	--	--	--	770
		W. CHESTER STREET												
			43CH+63	-	49CH+47	--	--	--	--	--	--	--	--	610
		SUBTOTALS				5,319	69	1	1	--	715	1,117	--	5,435
									2					
		MAINLINE												
1000	2	IH 894/USH 45												
			221NS+29	-	221NS+29	--	--	--	--	--	--	39	--	--
			220NS+11	-	228NS+68	899	--	--	--	--	--	--	--	--
		IH 94												
			111EW+22	-	111EW+39	--	--	--	--	91	--	--	--	--
			111EW+41	-	111EW+41	--	--	--	--	66	--	--	--	--
			285EW+10	-	285EW+25	16	--	--	--	--	--	--	--	--
			299EW+90	-	302EW+55	265	--	--	--	--	--	--	--	--
		RAMPS												
		RAMP NW												
			488NW+46	-	495NW+28	--	690	--	--	--	--	--	--	--

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FENCING ITEMS (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	TO	STATION	616.0206 FENCE CHAIN LINK 6-FT LF	616.0208 FENCE CHAIN LINK 8-FT LF	616.0329.0001 GATES CHAIN LINK 8-FT EACH	616.0329.0002 GATES CHAIN LINK 12-FT EACH	616.0406 FENCE CHAIN LINK SALVAGED 6-FT LF	SPV.0090.0600 FENCE TEMPORARY 6-FT LF	SPV.0090.0602 FENCE TEMPORARY LEFT IN PLACE 6-FT LF	SPV.0090.0603 FENCE TEMPORARY LEFT IN PLACE 8-FT LF	SPV.0090.0604 FENCE CHAIN LINK SCREENING 6-FT LF
1000	2	RAMP NE												
			520NE+43	-	536NE+08	--	--	--	--	--	--	--	1,603	--
		RAMP BD												
			723BD+02	-	723BD+37	48	--	--	--	--	--	--	--	--
			729BD+89	-	733BD+34	--	--	--	--	--	--	349	--	--
		RAMP SA												
			572SA+36	-	576SA+48	--	418	--	--	--	--	--	--	--
		RAMP SB												
			560SB+68	-	570SB+84	1,025	--	--	--	--	--	--	--	--
			564SB+30		--	--	--	--	1	--	--	--	--	--
			568SB+60		--	--	--	--	1	--	--	--	--	--
			571SB+06	-	571SB+64	60	--	--	--	--	--	--	--	--
		RAMP FD												
			728FD+95	-	736FD+57	885	--	--	--	--	--	--	--	--
		RAMP TMD												
			287EW+00	-	789TMD+92	328	--	--	--	--	--	--	--	--
		LOCAL ROADS												
		W. WISCONSIN AVENUE												
			31WX+78	-	33WX+47	--	--	--	--	--	--	177	--	--
		W. ADLER STREET												
			993AD+67	-	995AD+34	--	--	--	--	--	165	--	--	--
		W. CHESTER STREET												
			49CH+16	-	50CH+96	--	--	--	--	--	180	--	--	--
		SUBTOTALS				3,526	1,108	--	2	157	345	565	1,603	--
		RAMPS												
1000	3	RAMP SA												
			560SA+56	-	571SA+53	--	1,169	--	--	--	--	--	--	--
		LOCAL ROADS												
		W. WISCONSIN AVENUE												
			26WX+66	-	26WX+83	--	--	--	--	--	--	152	--	--
		SUBTOTALS				--	1,169	--	--	--	--	152	--	--
		MAINLINE												
1000	4	IH 94												
			751FB+20	-	260EW+74	961	--	--	--	--	--	--	--	--
			284EW+43	-	284EW+88	49	--	--	--	--	--	--	--	--
		RAMPS												
		RAMP FC												
			834FC+50	-	836FC+50	261	--	--	--	--	--	--	--	--
		SUBTOTALS				1,271	--	--	2	--	--	--	--	--
		TOTALS				10,116	2,346	1	3	157	1,060	1,834	1,603	5,435

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REMOVING OLD STRUCTURE

CATEGORY	LOCATION	STATION TO STATION	STAGE	203.0200.0015 REMOVING OLD STRUCTURE STA 2FCV+72 LS	203.0200.0017 REMOVING OLD STRUCTURE STA 265EW+00 LS	203.0210.S.0005 ABATEMENT OF ASBESTOS CONTAINING MATERIAL B-40-0093 LS
1000	B-40-93	2FCV+72 - 13FCV+48	1,2,3,4	1		1
	B-40-89	264EW+50 - 265EW+30	4		1	
	TOTALS			1	1	1

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EXCAVATION, HAULING, AND REUSE OF SOLID WASTE SOIL

CATEGORY	STAGE	LOCATION	STATION TO STATION	SPV.0035.0700 CY
		MAINLINE		
1000	2	IH 94	182EW+50 - 186EW+00	13,830
		RAMPS		
		RAMP GD	775GD+75 - 779GD+76	1,592
		TEMPORARY ROADS		
		RAMP EWD	16EWD+00 - 19EWD+00	1,152
		SUBTOTAL		16,574
		TOTAL		16,574

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CONCRETE STAINING

CATEGORY	STRUCTURE	517.1010.S.0001* CONCRETE STAINING B-40-785 SF
1000	B-40-785	12,742
	TOTAL	12,742

LIGHTWEIGHT FOAMED CONCRETE FILL GRADE

CATEGORY	STAGE	ROADWAY	STATION TO STATION	SPV.0035.4020 LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 1 CY	SPV.0035.4030 LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 2 CY
1000	2	RAMP GD (R-40-525)	774GD+00 - 779GD+76	12,896	4,034
		TOTALS		12,896	4,034

ARCHITECTURAL SURFACE TREATMENT

CATEGORY	LOCATION	STATION TO STATION	517.1050.S.0022 ARCHITECTURAL SURFACE TREATMENT MINOR RETAINING WALL R-1 SF
1000	MINOR RETAINING WALL R-1	10+00 - 13+31	1,150
	TOTAL		1,150

EXPOSING EXISTING UTILITIES

CATEGORY	LOCATION	SPV.0060.0003 EXPOSING EXISTING UTILITY UNPAVED AREA EACH	SPV.0060.0004 EXPOSING EXISTING UTILITY PAVED AREA EACH
1000	UNDISTRIBUTED	150	150
	TOTALS	150	150

CPM SCHEDULE ITEMS

CATEGORY	LOCATION	SPV.0060.0005 BASELINE CPM PROGRESS SCHEDULE EACH	SPV.0060.0006 MONTHLY CPM PROGRESS SCHEDULE UPDATES EACH
1000	UNDISTRIBUTED	1	20
	TOTALS	1	20

EROSION CONTROL ITEMS

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	OFFSET	628.1104 EROSION BALES EACH	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH	628.2004 EROSION MAT CLASS I TYPE B SY	628.2021 EROSION MAT CLASS II TYPE A SY	628.2023 EROSION MAT CLASS II TYPE B SY	628.7504 TEMPORARY DITCH CHECKS LF	628.7555 CULVERT PIPE CHECKS EACH	628.7570 ROCK BAGS EACH
		MAINLINE															
1000	1	IH 894/USH 45 NB															
			323NS+99	-	324NS+70	RT	--	--	--	--	--	--	--	--	48	--	--
		IH 94 EB															
			299EW+90	-	304EW+81	RT	--	491	491	--	--	288	--	--	--	--	--
		RAMPS															
		RAMP SA															
			570SA+00	-	574SA+75	RT/LT		--	--	--	--	2,378	--	--	56	--	--
		RAMP FA															
			743FA+00	-	747FA+75	--	2	468	468	--	--	--	--	--	--	--	--
		RAMP FH															
			802FH+35	-	809FH+50	LT	1	196	196	--	--	1,994	--	--	--	--	--
		MOORLAND ROAD LOOP RAMP					140	568	568	--	--	--	--	7,788	--	--	--
		LOCAL ROADS															
		W. WISCONSIN AVENUE															
			UTILITY WORK				--	--	--	--	--	374	--	--	--	--	--
			UTILITY WORK				--	--	--	--	--	490	--	--	--	--	--
		N. 97TH STREET															
			UTILITY WORK				--	--	--	--	--	171	--	--	--	--	--
			UTILITY WORK				--	--	--	--	--	552	--	--	--	--	--
		N. 95TH STREET															
			UTILITY WORK				--	--	--	--	--	540	--	418	--	--	--
		W. BURLEIGH STREET															
			UTILITY WORK				--	--	--	--	--	401	--	418	--	--	--
		W. CHESTER STREET															
			53CH+92	-	55CH+50	LT	--	--	--	--	--	--	--	438	--	--	--
		TEMPORARY ROADS															
		RAMP NSC/R-40-557															
			10NSC+00	-	23NSC+97		--	--	--	--	--	1,212	--	5,453	204	--	--
		SUBTOTAL					143	1,723	1,723	--	--	8,400	--	14,515	308	--	--
													2				
		MAINLINE															
1000	2	IH 894/USH 45 NB															
			323NS+77	-	334NS+20	RT	--	851	851	--	--	21,098	--	--	144	1	--
			335NS+48	-	342NS+45	RT	--	--	--	--	--	12,564	--	--	120	--	--
		IH 894/USH 45 SB															
			221NS+45	-	228NS+74	LT	40	121	121	--	--	7,533	--	--	48	--	--
			304NS+46	-	312NS+82	LT	--	--	--	--	--	4,132	--	--	--	--	--
			334NS+67	-	346NS+55	LT	--	257	257	--	--	10,337	141	--	60	--	--

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EROSION CONTROL ITEMS (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	OFFSET	628.1104 EROSION BALES EACH	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH	628.2004 EROSION MAT CLASS I TYPE B SY	628.2021 EROSION MAT CLASS II TYPE A SY	628.2023 EROSION MAT CLASS II TYPE B SY	628.7504 TEMPORARY DITCH CHECKS LF	628.7555 CULVERT PIPE CHECKS EACH	628.7570 ROCK BAGS EACH
1000	2	IH 94 EB															
			87EW+54	-	99EW+45	RT	100	1,279	1,279	--	--	1,911	--	3,235	--	--	--
			102EW+09	-	111EW+53	RT	--	1,079	1,079	--	--	4,074	--	3,712	--	--	--
			136EW+64	-	147EW+00	RT/LT	--	--	--	--	--	1,582	--	315	41	--	--
			147EW+00	-	162EW+00	RT/LT	--	--	--	--	--	4,875	--	773	277	3	--
			162EW+00	-	188EW+14	RT/LT	--	--	--	--	--	29,946	--	666	91	1	--
		IH 94 WB															
			87EW+85	-	99EW+35	LT	289	1,247	1,247	--	--	2,224	--	3,940	--	--	--
			101EW+71	-	111EW+68	LT	--	1,130	1,130	--	--	3,971	--	4,028	--	--	--
			176EW+72	-	182EW+49	LT	--	--	--	--	--	577	--	--	--	--	--
			202EW+80	-	209EW+83	RT/LT	--	--	--	--	--	2,480	--	--	--	--	--
			293EW+40	-	297EW+50	LT	--	410	410	--	--	272	--	--	--	--	--
		RAMPS															
		RAMP NW															
			475NW+86	-	495NW+53	LT/RT	--	1,273	1,273	--	--	3,511	--	5,148	30	--	--
		RAMP NW INTERIM SLOPE															
			479NW+65	-	493NW+11	RT	--	--	--	--	--	--	--	10,688	87	--	--
		RAMP EN															
			524EN+86	-	529EN+43	RT/LT	--	--	--	--	--	--	--	5,416	--	--	--
		RAMP NE															
			520NE+56	-	535NE+00	48' RT	--	756	756	--	--	3,400	--	--	144	--	--
		RAMP GD															
			768GD+01	-	779GD+80	LT/RT	--	--	--	--	--	1,987	--	4,296	--	--	--
		RAMP BB															
			822BB+41	-	823BB+32	RT	--	--	--	--	--	232	--	--	--	--	--
		RAMP BC															
			702BC+69	-	708BC+52	LT/RT	--	--	--	--	--	4,105	--	--	24	1	--
			720BC+46	-	721BC+91	LT/RT	--	137	137	--	--	605	--	--	--	--	--
		RAMP WC															
			746WC+46	-	749WC+62	LT	--	--	--	--	--	321	17	--	--	--	--
		RAMP FA															
			738FA+25	-	747FA+75	RT	--	--	--	--	--	1,133	--	--	--	--	--
		RAMP FC															
			795FC+45	-	801FC+60	RT	--	--	--	--	--	1,045	--	--	--	--	--
		RAMP FD															
			727FD+50	-	737FD+00	LT	10	--	--	--	--	3,131	--	--	--	--	--

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EROSION CONTROL ITEMS (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	OFFSET	628.1104 EROSION BALES EACH	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH	628.2004 EROSION MAT CLASS I TYPE B SY	628.2021 EROSION MAT CLASS II TYPE A SY	628.2023 EROSION MAT CLASS II TYPE B SY	628.7504 TEMPORARY DITCH CHECKS LF	628.7555 CULVERT PIPE CHECKS EACH	628.7570 ROCK BAGS EACH
1000	2	RAMP TMD															
			773TMD+25	-	790TMD+00	--	6	1,534	1,534	--	--	4,881	--	--	--	--	--
		LOCAL ROADS															
		S. 100TH STREET															
			25TD+11	-	37TD+07	RT	--	--	--	--	--	931	--	--	--	--	--
		SCHLINGER AVENUE															
			526SCH+68	-	530SCH+84	RT	--	--	--	--	--	455	--	--	--	--	--
		O'CONNOR STREET															
			544CR+50	-	557CR+50	RT	6	996	996	--	--	2,226	--	--	--	--	--
		S. 84TH STREET															
			44F+50	-	48F+25	LT	--	375	375	--	--	--	--	--	--	--	--
		TEMPORARY ROADS															
		RAMP NSA															
			28NSA+34	-	29NSA+38	RT	--	105	105	--	--	111	--	--	--	--	--
		RAMP NEA															
			9NEA+19	-	16NEA+50		--	--	--	--	--	1,774	--	675	--	--	--
		RAMP NEB															
			3NEB+19	-	11NEB+25	RT/LT	--	--	--	--	--	2,504	--	--	--	--	--
		SUBTOTAL					451	11,550	11,550	--	--	139,928	158	42,892	1,066	6	--
															2		
		MAINLINE															
1000	3	IH 894/USH 45 NB															
			273NS+75	-	279NS+90	LT/RT	--	611	611	--	--	415	--	683	12	--	--
			280NS+50	-	290NS+05	LT/RT	102	1,212	1,212	--	--	2,133	--	5,486	36	--	--
			289NS+73	-	296NS+86	LT/RT	--	568	568	--	--	--	--	10,230	--	1	--
		IH 894/USH 45 SB															
			323NS+25	-	331NS+49	LT	--	--	--	--	--	1,797	--	--	192	--	--
			331NS+63	-	343NS+95	RT	--	--	--	--	--	9,010	--	--	72	--	--
			333NS+56	-	345NS+93	LT	--	--	--	--	--	3,735	17	--	72	--	--
		IH 94 EB															
			204EW+50	-	210EW+00	RT	3	556	556	--	--	--	--	--	--	--	--
		RAMPS															
		RAMP SW															
			561SW+13	-	571SW+23	RT/LT	--	--	--			--	--	1,278	53	--	--
			592SW+75	-	595SW+94	LT	--	103	103	--	--	360	--	1,168	--	--	--
		RAMP BD															
			724BD+90	-	733BD+59	LT	--	--	--	--	--	5,055	--	--	96	--	--
		RAMP SA															
			548SA+35	-	554SA+42	LT	--	468	468	--	--	1,348	--	--	--	--	--

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EROSION CONTROL ITEMS (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	OFFSET	628.1104 EROSION BALES EACH	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH	628.2004 EROSION MAT CLASS I TYPE B SY	628.2021 EROSION MAT CLASS II TYPE A SY	628.2023 EROSION MAT CLASS II TYPE B SY	628.7504 TEMPORARY DITCH CHECKS LF	628.7555 CULVERT PIPE CHECKS EACH	628.7570 ROCK BAGS EACH
		MAINLINE															
1000	5	IH 894/USH 45 SB															
			309NS+53	-	315NS+64	LT	--	--	--	--	--	930	--	--	--	--	--
			343NS+90	-	346NS+24	RT	--	--	--	--	--	773	--	--	--	--	--
		SUBTOTAL					--	--	--	--	--	1,703	--	--	--	--	--
		UNDISTRIBUTED					285	7,390	7,390	40	20	89,430	70	38,585	978	3	250
		TOTAL					997	25,865	25,865	40	20	313,004	245	135,048	3,422	11	250

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RESTORATION ITEMS

CATEGORY	LOCATION	STATION	TO	STATION	629.0210 FERTILIZER TYPE B CWT	630.0130 SEEDING MIXTURE NO. 30 LB	630.0180 SEEDING MIXTURE NO. 80 LB	630.0200 SEEDING TEMPORARY LB	630.0400 SEEDING NURSE CROP LB	631.0300 SOD WATER MGAL	631.1000 SOD LAWN SY	SPV.0085.0200 SEEDING MIXTURE NATIVE SEED BUTTERFLY MIX LB	SPV.0180.0200 TOPSOIL SPECIAL SY
	MAINLINE												
1000	IH 894/USH 45 NB												
		276NS+00	-	279NS+90	.7	8	5	15	5	--	--	--	1,099
		280NS+50	-	290NS+05	4.8	39	40	103	40	--	--	--	7,618
		289NS+73	-	296NS+86	6.4	--	74	139	74	--	--	--	10,230
		297NS+19	-	317NS+90	9.9	155	52	212	52	--	--	--	15,678
		323NS+77	-	334NS+20	6.2	178	--	134	81	--	--	41	21,098
		335NS+48	-	342NS+45	7.9	227	--	170	--	--	--	--	12,564
	IH 894/USH 45 SB												
		221NS+45	-	228NS+43	4.7	136	--	102	--	--	--	--	7,533
		302NS+45	-	312NS+00	2.6	75	--	56	--	--	--	--	4,132
		308NS+00	-	317NS+90	.6	17	--	13	--	--	--	--	930
		323NS+25	-	348NS+46	11.4	323	--	243	75	3.6	159	38	28,431
	IH 94 EB												
		87EW+54	-	99EW+45	3.2	35	24	70	24	--	--	--	5,146
		102EW+09	-	111EW+53	4.9	74	27	106	27	--	--	--	7,785
		136EW+64	-	147EW+00	1.2	29	3	26	3	--	--	--	1,897
		147EW+00	-	162EW+00	3.6	88	6	77	6	--	--	--	5,649
		162EW+00	-	188EW+14	19.3	540	5	414	5	--	--	--	30,612
		247EW+75	-	263EW+50	1.8	--	21	40	21	--	--	--	2,909
		299EW+40	-	304EW+81	--	6	--	4	--	--	--	--	288
	IH 94 WB												
		87EW+85	-	99EW+35	3.9	41	29	84	29	--	--	--	6,164
		101EW+71	-	111EW+68	5.0	72	30	108	30	--	--	--	8,000
		176EW+72	-	182EW+49	.4	11	--	8	--	--	--	--	577

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RESTORATION ITEMS (CONTINUED)

CATEGORY	LOCATION	STATION	TO	STATION	629.0210 FERTILIZER TYPE B CWT	630.0130 SEEDING MIXTURE NO. 30 LB	630.0180 SEEDING MIXTURE NO. 80 LB	630.0200 SEEDING TEMPORARY LB	630.0400 SEEDING NURSE CROP LB	631.0300 SOD WATER MGAL	631.1000 SOD LAWN SY	SPV.0085.0200 SEEDING MIXTURE NATIVE SEED BUTTERFLY MIX LB	SPV.0180.0200 TOPSOIL SPECIAL SY
	RAMPS												
1000	RAMP SW												
		561SW+13	-	571SW+23	.8	--	10	18	10	--	--	--	1,278
		592SW+75	-	595SW+94	1.0	7	9	21	9	--	--	--	1,528
		598SW+95	-	603SW+75	.6	18	--	14	--	--	--	--	967
	RAMP NW												
		475NW+86	-	495NW+53	19.2	304	99	412	99	--	--	--	30,512
	RAMP NW INTERIM SLOPE												
		479NW+65	-	493NW+11	6.7	--	77	145	77	--	--	--	10,688
	RAMP WS												
		580WS+81	-	586WS+32	1.5	13	12	32	12	--	--	--	2,340
	RAMP SE												
		576SE+95	-	579SE+70	.3	10	--	15	--	--	--	--	547
	RAMP NE												
		520NE+50	-	532NE+31	2.1	62	--	46	--	--	--	--	3,400
	RAMP EN												
		524EN+75	-	529EN+50	3.4	--	39	74	--	--	--	--	5,416
	RAMP GD												
		768GD+01	-	779GD+80	4.0	36	31	85	31	--	--	--	6,284
	RAMP BB												
		822BB+41	-	823BB+32	.1	5	--	4	--	--	--	--	232
	RAMP BC												
		702BC+69	-	708BC+50	2.6	74	--	56	--	--	--	--	4,105
		720BC+46	-	721BC+90	.4	11	--	9	--	--	--	--	605
	RAMP BD												
		723BD+04	-	733BD+59	3.2	91	--	69	--	--	--	--	5,055
	RAMP WC												
		746WC+46	-	749WC+44	.2	6	--	5	--	.4	17	--	338
	RAMP SA												
		548SA+50	-	574SA+75	6.6	185	--	139	--	--	--	--	10,506
	RAMP FA												
		738FA+00	-	753FA+00	1.1	21	--	16	--	12.2	542	--	1,674
	RAMP FB												
		737FB+75	-	758FB+25	2.2	41	--	31	--	26.7	1,187	--	3,413
	RAMP FC												
		795FC+25	-	801FC+75	.4	13	--	10	--	--	--	--	683
		822FC+00	-	836FC+75	4.2	119	--	90	--	--	--	--	6,606
	RAMP FD												
		724FD+50	-	737FD+00	2.1	57	--	43	--	4.8	215	--	3,346
	RAMP FH												
		802FH+50	-	809FH+50	1.3	36	--	27	--	--	--	--	1,994

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RESTORATION ITEMS (CONTINUED)

CATEGORY	LOCATION	STATION	TO	STATION	629.0210 FERTILIZER TYPE B CWT	630.0130 SEEDING MIXTURE NO. 30 LB	630.0180 SEEDING MIXTURE NO. 80 LB	630.0200 SEEDING TEMPORARY LB	630.0400 SEEDING NURSE CROP LB	631.0300 SOD WATER MGAL	631.1000 SOD LAWN SY	SPV.0085.0200 SEEDING MIXTURE NATIVE SEED BUTTERFLY MIX LB	SPV.0180.0200 TOPSOIL SPECIAL SY
1000	W. ADLER STREET												
		984AD+00	-	996AD+00	.5	--	--	--	--	16.6	741	--	741
		996AD+00	-	1009AD+00	.5	--	--	--	--	17.1	761	--	761
		1009AD+00	-	1024AD+00	.7	--	--	--	--	24.3	1,084	--	1,084
	W. KEARNEY STREET												
		136KE+00	-	146KE+25	.3	--	--	--	--	9.2	409	--	409
	O' CONNOR STREET												
		543CR+00	-	557CR+50	1.6	41	--	31	--	5.5	246	--	2,473
	TEMPORARY ROADS												
	RAMP NSA												
		28NSA+34	-	29NSA+38	.1	2	--	2	--	--	--	--	111
	RAMP NSC												
		10NSC+00	-	23NSC+97	4.2	22	40	90	40	--	--	--	6,665
	RAMP NSF												
		17NSF+43	-	22NSF+17	1.2	34	--	26	--	--	--	--	1,867
	RAMP NEA												
		5NEA+34	-	16NEA+50	1.5	32	5	34	5	--	--	--	2,449
	RAMP NEB												
		3NEB+00	-	11NEB+25	1.6	46	--	34	--	--	--	--	2,504
	SUBTOTAL				197.3	3,639	699	4,041	816	376.1	16,742	79	334,834
	UNDISTRIBUTED				19.7	364	70	404	82	37.6	1,674	8	33,483
	TOTAL				217.0	4,003	769	4,445	898	413.7	18,416	87	368,317

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INLET PROTECTION

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	628.7005 TYPE A EACH	628.7010 TYPE B EACH	628.7015 TYPE C EACH	628.7020 TYPE D EACH
		MAINLINE							
1000	1	IH 894/USH 45 NB							
			264NS+00	-	318NS+00	20	--	--	84
			319NS+35	-	323NS+00	--	--	--	24
			323NS+00	-	338NS+00	--	--	--	32
			338NS+00	-	352NS+20	--	--	--	10
		IH 894/USH 45 SB							
			217NS+00	-	235NS+00	2	--	--	12
			264NS+00	-	318NS+00	8	--	2	66
			320NS+00	-	323NS+00	--	--	--	20
			323NS+00	-	338NS+00	--	--	--	74
			338NS+00	-	352NS+20	--	--	--	66
		IH 94 EB							
			88EW+00	-	186EW+00	--	18	--	76
			186EW+00	-	296EW+00	38	--	28	162
			245EW+00	-	279EW+25	70	--	--	80
		IH 94 WB							
			88EW+00	-	188EW+00	--	4	6	92
			188EW+00	-	296EW+00	38	--	14	130
			239EW+00	-	279EW+25	44	2	--	48
		RAMPS							
		RAMP NW							
			475NW+80	-	494NW+00	--	4	--	10
			494NW+00	-	498NW+00	6	--	--	6
		RAMP WS							
			581WS+00	-	584WS+00	--	--	--	2
			587WS+00	-	593WS+00	--	--	--	6
		RAMP ES							
			600ES+00	-	605ES+00	--	--	--	10
		RAMP SE							
			576SE+00	-	583SE+00	--	2	--	14
			593SE+00	-	597SE+00	2	--	--	4
		RAMP EN							
			529EN+00	-	533EN+00	--	--	--	2
			523EN+00	-	527EN+00	2	--	--	8
		RAMP NE							
			522NE+00	-	541NE+00	30	--	--	34
			549NE+00	-	553NE+00	4	--	--	--
		RAMP SW							
			589SW+00	-	594SW+00	--	--	--	10
		RAMP GE							
			780GE+00	-	783GE+00	4	--	2	2

INLET PROTECTION (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	628.7005 TYPE A EACH	628.7010 TYPE B EACH	628.7015 TYPE C EACH	628.7020 TYPE D EACH
1000	1	RAMP BB							
			801BB+00	-	811BB+00	2	--	--	--
		RAMP BC							
			700BC+00	-	709BC+00	34	--	--	16
		RAMP WC							
			745WC+76	-	750WC+61	2	--	--	--
		RAMP SA							
			548SA+50	-	574SA+25	12	10	16	12
		RAMP FA							
			737FA+75	-	753FA+00	4	22	2	4
			738FA+00	-	748FA+00	20	--	18	--
		RAMP FB							
			737FB+50	-	758FB+00	--	28	6	4
		RAMP FC							
			826FC+00	-	837FC+50	4	4	6	2
			803FC+50	-	993AD+00	4	--	--	--
		RAMP FD							
			726FD+00	-	737FD+50	6	8	--	--
			722FD+00	-	737FD+00	10	--	10	--
		RAMP FH							
			802FH+00	-	821FH+00	12	2	14	2
		RAMP TMC							
			774TMC+00	-	784TMC+00	6	6	2	2
		RAMP TMD							
			778TMD+00	-	790TMD+00	4	14	--	--
		LOCAL ROADS							
		W. BLUEMOUND RD							
			191BL+20	-	195BL+90	36	8	8	--
			198BL+70	-	205BL+60	32	10	16	--
		W. WISCONSIN AVENUE							
			25WX+68	-	27WX+25	--	2	12	--
			31WX+13	-	33WX+11	--	2	8	--
		N. 97TH STREET							
			40TF+20	-	47TF+73	--	2	12	2
		N. 95TH STREET							
			39TRN+80	-	49TRN+69	28	6	16	--

2

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INLET PROTECTION (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	628.7005 TYPE A EACH	628.7010 TYPE B EACH	628.7015 TYPE C EACH	628.7020 TYPE D EACH
1000	1	W. BURLEIGH STREET							
			UTILITY WORK			--	--	4	4
		N. 92ND STREET							
			60TJ+00	-	70TJ+00	2	26	--	--
		W. ADLER STREET							
			984AD+00	-	1024AD+00	4	38	44	--
			983AD+50	-	994AD+00	36	--	34	--
		W. CHESTER STREET							
			46CH+00	-	60CH+00	--	26	4	--
			45CH+50	-	54CH+75	24	--	24	--
		W. SCHLINGER AVE							
			524SCH+00	-	534SCH+00	2	--	10	--
		O' CONNOR STREET							
			544CR+00	-	582CR+00	--	38	--	--
		W. KEARNEY STREET							
			137KE+00	-	145KE+00	--	10	2	--
		S. 84TH STREET							
			35F+00	-	48F+00	4	28	--	--
			42F+00	-	48F+00	26	--	26	--
		S. 100TH STREET							
			20TD+00	-	40TD+00	--	--	24	--
		SUBTOTAL				582	320	370	1,132
									2
		MAINLINE							
1000	2	IH 894/USH 45 SB							
			228NS+00	-	229NS+00	2	--	--	--
			288NS+00	-	316NS+00	6	--	--	4
		IH 94 EB							
			136EW+00	-	186EW+00	56	12	--	44
			236EW+00	-	236EW+50	12	--	--	12
		IH 94 WB							
			136EW+00	-	190EW+00	4	--	--	--
			212EW+75	-	281EW+50	76	2	6	60
		RAMPS							
		RAMP SW							
			581SW+00	-	592SW+00	--	--	--	14
			590SW+00	-	597SW+00	14	--	2	12
		RAMP NW							
			477NW+00	-	495NW+00	26	--	--	26
		RAMP EN							
			514EN+00	-	516EN+25	4	--	2	--

INLET PROTECTION (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	628.7005 TYPE A EACH	628.7010 TYPE B EACH	628.7015 TYPE C EACH	628.7020 TYPE D EACH
1000	2	RAMP NE							
			555NE+00	-	567NE+00	26	--	--	8
		RAMP BB							
			806BB+00	-	807BB+00	--	--	--	2
		RAMP WC							
			745WC+76	-	750WC+61	4	--	--	--
		RAMP FA							
			738FA+00	-	749FA+75	6	--	4	2
		RAMP FC							
			803FC+25	-	829FC+50	48	2	14	14
		RAMP FD							
			722FD+00	-	731FD+00	6	--	6	--
		RAMP FG							
			717FG+00	-	720FG+00	8	--	--	8
		RAMP FH							
			802FH+05	-	821FH+00	18	--	16	2
		RAMP TMD							
			770TMD+00	-	788TMD+25	28	2	22	4
		LOCAL ROADS							
		N. 97TH STREET							
			40TF+00	-	46TF+00	--	--	2	4
		N. 95TH STREET							
			39TRN+80	-	49TRN+69	8	--	--	--
		N. 92ND STREET							
			67TJ+50	-	69TJ+00	12	--	12	--
		S. 84TH STREET							
			45F+00	-	48F+50	16	--	16	--
		O'CONNOR STREET							
			543CR+00	-	582CR+25	4	2	2	--
		S. 100TH STREET							
			34TD+00	-	35TD+00	--	--	4	--
		SUBTOTAL				384	20	108	216
		MAINLINE							
1000	3	IH 894/USH 45 NB							
			276NS+00	-	285NS+00	22	--	--	10
		IH 894/USH 45 SB							
			300NS+00	-	301NS+00	--	--	--	2
			323NS+00	-	338NS+00	--	--	--	36

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INLET PROTECTION (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	628.7005 TYPE A EACH	628.7010 TYPE B EACH	628.7015 TYPE C EACH	628.7020 TYPE D EACH
1000	3	IH 94 EB							
			206EW+00	-	281EW+25	48	--	--	48
		IH 94 WB							
			207EW+00	-	283EW+25	38	--	--	42
		RAMPS							
		RAMP SW							
			562SW+50	-	570SW+50	12	4	--	10
		RAMP NE							
			559NE+50	-	580NE+00	18	--	--	14
		RAMP SE							
			577SE+00	-	579SE+00	4	--	--	4
		RAMP BD							
			723BD+02	-	735BD+18	34	--	--	10
		RAMP WC							
			745WC+76	-	750WC+61	2	4	--	--
		RAMP SA							
			548SA+00	-	574SA+25	40	24	4	12
		RAMP GE							
			788GE+00	-	790GE+00	8	--	--	4
		LOCAL ROADS							
		W. BLUEMOUND RD							
			191BL+20	-	195BL+90	--	--	34	--
			198BL+70	-	205BL+60	--	--	32	--
		N. 95TH STREET							
			39TRN+80	-	49TRN+69	--	2	22	12
		S. 92ND STREET							
			62TJ+00	-	64TJ+00	10	--	10	--
		SUBTOTAL				236	34	102	204
		MAINLINE							
1000	4	IH 894/USH 45 NB							
			269NS+00	-	319NS+00	38	--	--	34
		IH 894/USH 45 SB							
			338NS+00	-	352NS+20	--	--	--	8
		IH 94 EB							
			231EW+00	-	284EW+00	40	--	6	32
		IH 94 WB							
			187EW+00	-	189EW+00	4	--	--	--
			251EW+00	-	254EW+00	8	--	--	8

INLET PROTECTION (CONTINUED)

CATEGORY	STAGE	LOCATION	STATION	TO	STATION	628.7005 TYPE A EACH	628.7010 TYPE B EACH	628.7015 TYPE C EACH	628.7020 TYPE D EACH
		RAMPS							
1000	4	RAMP WS							
			582WS+00	-	586WS+00	6	4	--	2
		RAMP NE							
			557NE+50	-	581NE+50	14	--	--	14
		RAMP SE							
			576SE+00	-	577SE+00	4	--	--	4
		RAMP BB							
			798BB+00	-	804BB+00	14	--	--	10
		RAMP BD							
			723BD+02	-	735BD+18	--	18	12	4
		RAMP WC							
			745WC+76	-	750WC+61	--	4	--	--
		RAMP FB							
			738FB+00	-	755FB+00	34	14	12	4
		RAMP FC							
			829FC+50	-	837FC+00	22	4	14	4
		RAMP TMC							
			774TMC+00	-	782TMC+50	16	--	8	2
		LOCAL ROADS							
		W. ALDER STREET							
			1011AD+00	-	1023AD+75	8	--	8	--
		S. 84TH STREET							
			36F+00	-	40F+00	18	--	16	--
		W. KEARNEY STREET							
			139KE+00	-	145KE+00	10	--	10	--
		SUBTOTAL				236	44	86	126
		TOTALS				1,438	418	666	1,678

NOTE: INLET PROTECTION IS QUANTIFIED TWICE AT EACH LOCATION 2

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TRAFFIC CONTROL ITEMS

CATEGORY	STAGE	LOCATION	STAGE DURATION DAYS	643.0200.0001 TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE 1060-33-80 DAYS	643.0300* TRAFFIC CONTROL DRUMS EACH**	643.0300* TRAFFIC CONTROL DRUMS DAY	643.0410 TRAFFIC CONTROL BARRICADES TYPE II EACH**	643.0410 TRAFFIC CONTROL BARRICADES TYPE II DAY	643.0420* TRAFFIC CONTROL BARRICADES TYPE III EACH**	643.0420* TRAFFIC CONTROL BARRICADES TYPE III DAY	643.0500 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER POSTS EACH	643.0600 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER BASES EACH	643.0705* TRAFFIC CONTROL WARNING LIGHTS TYPE A EACH**	643.0705* TRAFFIC CONTROL WARNING LIGHTS TYPE A DAY	643.0715* TRAFFIC CONTROL WARNING LIGHTS TYPE C EACH**	643.0715* TRAFFIC CONTROL WARNING LIGHTS TYPE C DAY
1000	1A	**STAGE 1A SECTION 1 AND 2**	61	61												
		IH 894/USH 45 NB			6	366	--	--	--	--	--	--	--	--	--	--
		IH 894/USH 45 SB			--	--	--	--	--	--	--	--	--	--	--	--
		IH 94 EB			13	793	--	--	--	--	--	--	--	--	--	--
		IH 94 WB			33	2,013	--	--	4	244	--	--	8	488	--	--
		RAMP WS			5	305	--	--	--	--	--	--	--	--	5	305
		W. BLUEMOUND ROAD			21	1,281	5	305	28	1,708	--	--	56	3,416	21	1,281
		W. WISCONSIN AVENUE			12	732	--	--	1	61	--	--	2	122	5	305
		N. 103RD STREET			--	--	--	--	1	61	--	--	2	122	--	--
		N. 99TH STREET			--	--	--	--	1	61	--	--	2	122	--	--
		N. 98TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		N. 97TH STREET			--	--	--	--	8	488	--	--	16	976	--	--
		N. 95TH STREET			24	1,464	--	--	7	427	--	--	14	854	--	--
		N. 94TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		N. 93RD STREET			--	--	--	--	--	--	--	--	--	--	--	--
		W. ADLER STREET			38	2,318	--	--	4	244	--	--	8	488	--	--
		W. CHESTER STREET			--	--	1	61	8	488	--	--	16	976	--	--
		S. 94TH PLACE			--	--	--	--	2	122	--	--	4	244	--	--
		S. 92ND STREET			9	549	--	--	2	122	--	--	4	244	--	--
		S. 84TH STREET			19	1,159	4	244	21	1,281	--	--	42	2,562	19	1,159
		S. 82ND STREET			--	--	--	--	5	305	--	--	10	610	--	--
		S. HONEY CREEK DRIVE			--	--	--	--	3	183	--	--	6	366	--	--
		W HONEY CREEK PARKWAY			--	--	--	--	--	--	--	--	--	--	--	--
		S. 80TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		S. 79TH STREET			--	--	--	--	--	--	--	--	--	--	--	--

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Addendum No. 2
ID 1060-33-80
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(CONTINUED ON NEXT SHEET)

TRAFFIC CONTROL ITEMS (CONTINUED)

CATEGORY	STAGE	LOCATION	STAGE DURATION DAYS	643.0200.0001 TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE 1060-33-80 DAYS	643.0300* TRAFFIC CONTROL DRUMS EACH**	643.0300* TRAFFIC CONTROL DRUMS DAY	643.0410 TRAFFIC CONTROL BARRICADES TYPE II EACH**	643.0410 TRAFFIC CONTROL BARRICADES TYPE II DAY	643.0420* TRAFFIC CONTROL BARRICADES TYPE III EACH**	643.0420* TRAFFIC CONTROL BARRICADES TYPE III DAY	643.0500 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER POSTS EACH	643.0600 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER BASES EACH	643.0705* TRAFFIC CONTROL WARNING LIGHTS TYPE A EACH**	643.0705* TRAFFIC CONTROL WARNING LIGHTS TYPE A DAY	643.0715* TRAFFIC CONTROL WARNING LIGHTS TYPE C EACH**	643.0715* TRAFFIC CONTROL WARNING LIGHTS TYPE C DAY
1000	1A	S. 78TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		S. 77TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		W. O'CONNOR STREET			21	1,281	2	122	5	305	--	--	10	610	7	427
		ZOO PARKING LOT			--	--	--	--	15	915	--	--	30	1,830	--	--
		SUBTOTALS		61		12,261	2	732		7,015	--	--		14,030		3,477
1000	1B	**STAGE 1B SECTION 1 AND 2**	90	90												
		IH 894/USH 45 NB			10	900	--	--	--	--	26	26	--	--	--	--
		IH 894/USH 45 SB			32	2,880	--	--	--	--	--	--	--	--	--	--
		IH 94 EB			59	5,310	--	--	--	--	--	--	--	--	--	--
		IH 94 WB			91	8,190	--	--	4	360	--	--	8	720	10	900
		W. BLUEMOUND ROAD			33	2,970	5	450	28	2,520	--	--	56	5,040	21	1,890
		W. WISCONSIN AVENUE			17	1,530	--	--	8	720	--	--	16	1,440	--	--
		N. 103RD STREET			--	--	--	--	1	90	--	--	2	180	--	--
		N. 99TH STREET			--	--	--	--	1	90	--	--	2	180	--	--
		N. 98TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		N. 97TH STREET			5	450	--	--	9	810	--	--	18	1,620	--	--
		N. 95TH STREET			40	3,600	--	--	3	270	--	--	6	540	--	--
		N. 94TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		N. 93RD STREET			--	--	--	--	--	--	--	--	--	--	--	--
		W. ADLER STREET			40	3,600	--	--	3	270	--	--	6	540	--	--
		W. CHESTER STREET			--	--	1	90	8	720	--	--	16	1,440	--	--
		S. 94TH PLACE			--	--	--	--	2	180	--	--	4	360	--	--
		S. 92ND STREET			9	810	--	--	2	180	--	--	4	360	--	--
		S. 84TH STREET			37	3,330	2	180	13	1,170	27	27	26	2,340	26	2,340
		S. 82ND STREET			--	--	--	--	5	450	--	--	10	900	--	--

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ID 1060-33-80
Revised Sheet 1694
August 12, 2014

(CONTINUED ON NEXT SHEET)

TRAFFIC CONTROL ITEMS (CONTINUED)

CATEGORY	STAGE	LOCATION	STAGE DURATION DAYS	643.0200.0001 TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE 1060-33-80 DAYS	643.0300* TRAFFIC CONTROL DRUMS EACH**	643.0300* TRAFFIC CONTROL DRUMS DAY	643.0410 TRAFFIC CONTROL BARRICADES TYPE II EACH**	643.0410 TRAFFIC CONTROL BARRICADES TYPE II DAY	643.0420* TRAFFIC CONTROL BARRICADES TYPE III EACH**	643.0420* TRAFFIC CONTROL BARRICADES TYPE III DAY	643.0500 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER POSTS EACH	643.0600 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER BASES EACH	643.0705* TRAFFIC CONTROL WARNING LIGHTS TYPE A EACH**	643.0705* TRAFFIC CONTROL WARNING LIGHTS TYPE A DAY	643.0715* TRAFFIC CONTROL WARNING LIGHTS TYPE C EACH**	643.0715* TRAFFIC CONTROL WARNING LIGHTS TYPE C DAY
1000	4A/4B	W. ADLER STREET			20	1,400	--	--	--	--	--	--	--	--	--	--
		S. 84TH STREET			87	6,090	2	140	22	1,540	78	78	44	3,080	18	1,260
		W. HONEY CREEK PARKWAY			--	--	--	--	--	--	--	--	--	--	--	--
		S. 75TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		S. 74TH STREET			--	--	--	--	--	--	--	--	--	--	--	--
		S. 73RD STREET			--	--	--	--	2	140	--	--	4	280	--	--
		W. O'CONNOR STREET			19	1,330	--	--	2	140	--	--	4	280	10	700
		W. KEARNEY STREET			--	--	2	140	5	350	--	--	10	700	--	--
		MITCHELL BLVD ENTRANCE RAMP			--	--	--	--	2	140	--	--	4	280	--	--
		SUBTOTALS		70		53,060		420		5,390	78	78		10,780		9,310
1000	5A	**STAGE 5A SECTION 2 (EAST LEG)**	35	35												
		IH 894/USH 45 NB			--	--	--	--	--	--	--	--	--	--	--	--
		IH 894/USH 45 SB			--	--	--	--	--	--	--	--	--	--	--	--
		IH 94 EB			174	6,090	--	--	--	--	--	--	--	--	85	2,975
		IH 94 WB			71	2,485	--	--	4	140	--	--	8	280	19	665
		RAMP SW			33	1,155	--	--	--	--	--	--	--	--	--	--
		RAMP NW			75	2,625	--	--	3	105	--	--	6	210	15	525
		RAMP WS			37	1,295	--	--	--	--	--	--	--	--	--	--
		RAMP FC			24	840	--	--	--	--	--	--	--	--	--	--
		RAMP FD			53	1,855	--	--	4	140	--	--	8	280	--	--
		W. BLUEMOUND ROAD			75	2,625	--	--	21	735	--	--	42	1,470	--	--
		W. WISCONSIN AVENUE			22	770	2	70	15	525	--	--	30	1,050	--	--
		SUBTOTALS		35		19,740		70		1,645	--	--		3,290		4,165
		UNDISTRIBUTED		--		77,964	2	1,136		10,678	65	65		21,356		13,524
		TOTALS		636		467,782		6,814		64,067	391	391		128,134		81,146

*ADDITIONAL QUANTITIES FOUND ELSEWHERE
**FOR INFORMATION ONLY

Addendum No. 2
ID 1060-33-80
Revised Sheet 1702
August 12, 2014

TRAFFIC CONTROL ITEMS

CATEGORY	STAGE	LOCATION	DAYS	643.0800* TRAFFIC CONTROL ARROW BOARDS EACH**	643.0800* TRAFFIC CONTROL ARROW BOARDS DAY	643.0900 TRAFFIC CONTROL SIGNS EACH**	643.0900 TRAFFIC CONTROL SIGNS DAY	643.0910* TRAFFIC CONTROL COVERING SIGNS TYPE I EACH	643.1050* TRAFFIC CONTROL SIGNS PCMS EACH**	643.1050* TRAFFIC CONTROL SIGNS PCMS DAY	SPV.0045.0400 TRUCK OR TRAILER MOUNTED ATTENUATOR DAY	SPV.0060.0404 TRAFFIC CONTROL COVERING SIGNS TYPE I LEFT IN PLACE EACH
1000	1A	**STAGE 1A SECTION 1 AND 2**	61									
		IH 894/USH 45 NB		--	--	47	2,867	--	1	61	--	--
		IH 894/USH 45 SB		--	--	34	2,074	--	--	--	--	--
		IH 94 EB		1	61	45	2,745	--	1	61	--	--
		IH 94 WB		--	--	48	2,928	1	1	61	--	--
		RAMP WS		--	--	1	61	--	--	--	--	--
		W. BLUEMOUND ROAD		--	--	34	2,074	--	2	122	--	--
		W. WISCONSIN AVENUE		--	--	7	427	--	--	--	--	--
		N. 103RD STREET		--	--	2	122	--	--	--	--	--
		N. 99TH STREET		--	--	2	122	--	--	--	--	--
		N. 98TH STREET		--	--	3	183	--	--	--	--	--
		N. 97TH STREET		--	--	3	183	--	--	--	--	--
		N. 95TH STREET		--	--	7	427	--	--	--	--	--
		N. 94TH STREET		--	--	1	61	--	--	--	--	--
		N. 93RD STREET		--	--	2	122	--	--	--	--	--
		W. ADLER STREET		--	--	19	1,159	--	--	--	--	--
		W. CHESTER STREET		--	--	7	427	--	--	--	--	--
		S. 94TH PLACE		--	--	1	61	--	--	--	--	--
		S. 92ND STREET		--	--	8	488	--	--	--	--	--
		S. 84TH STREET		--	--	31	1,891	--	2	122	--	--
		S. 82ND STREET		--	--	3	183	--	--	--	--	--
		S. HONEY CREEK DRIVE		--	--	3	183	--	--	--	--	--
		W HONEY CREEK PARKWAY		--	--	2	122	--	--	--	--	--
		S. 80TH STREET		--	--	1	61	--	--	--	--	--
		S. 79TH STREET		--	--	1	61	--	--	--	--	--

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ID 1060-33-80
Revised Sheet 1703
August 12, 2014

(CONTINUED ON NEXT SHEET)

STREETSCAPING ITEMS

CATEGORY	PROJECT NUMBER	632.9101 LANDSCAPE PLANTING SURVEILLANCE AND CARE CYCLES EACH
1000	1060-33-80	24
	TOTALS	24

BID ITEMS	SYM.	COMMON NAME	PLANTING LAYOUT SHEET NUMBERS 1 EACH	TOTALS EACH
		DECIDUOUS TREES (SHADE)		
632.0101.0001	HB	Buckeye, Homestead	3	3
632.0101.0003	NC	Catalpa, Northern	2	2
632.0101.0005	KC	Coffeetree, Kentucky	2	2
632.0101.0007	CH	Hackberry, Common	2	2
632.0101.0009	SH	Honeylocust, Skyline	3	3
632.0101.0011	HO	Oak, Heritage	1	1
632.0101.0013	SWO	Oak, Swamp White	2	2
632.0101.0015	BO	Oak, Bur	3	3
632.0101.0017	PR	Locust, Black Purple Robe	1	1
632.0101.0019	AB	Basswood, American	2	2
632.0101.0021	JE	Elm, Jefferson	4	4
632.0101.0023	AE	Elm, Accolade	3	3
		DECIDUOUS TREES (ORNAMENTAL)		
632.0101.0025	PF	Crabapple, Prairifire	5	5
632.0101.0027	RC	Crabapple, Robinson	9	9
632.0101.0029	TCH	Hawthorn, Thornless Cockspur	3	3
		EVERGREENS		
632.0101.0031	EC	Redcedar, Eastern	7	7
632.0101.0033	NS	Spruce,Norway	6	6
632.0101.0035	WS	Spruce, White	15	15
		SHRUBS		
632.0201.0037	CD	Dogwood, Corneliancherry (tree form)	9	9

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ID 1060-33-80
Revised Sheet 1756
August 12, 2014

TYPE I &II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
1	N/A	HOSPITAL												BLUE SIGN	12 X 4.5	54.00					A	1.2	68	600			5				
2		EXIT 2A DO NOT CROSS OVER TO 94 WEST	102 X 54	38.250					2																		4				
3	NOT USED																														
4	NOT USED																														
5	E5-1A (5)	EXIT 1B	72 X 60	30.000					2																		5				
6	PLAQUE	45 MPH	72 X 24	12.000										MOUNT UNDER SIGN # 5													5				
7	E6-1 MOD	94 WEST MADISON EXIT 45 MPH EXIT ONLY												MOUNT ON S-40-27 I BEAMS INCIDENTAL	17 X 13	221.00											4				
7A	E1-5BP	LEFT EXIT 1B												MOUNT ON SIGN # 7	9 X 4	36.00											4				
8	E6-1 MOD	94 EAST MILWAUKEE EXIT 45 MPH EXIT ONLY												MOUNT ON S-40-27 I BEAMS INCIDENTAL	16 X 12.5	200.00											4				
8A	E1-5P	EXIT 1A												MOUNT ON SIGN # 8	9 X 2.5	22.50											4				
9	E6-5.1 MOD	18 BLUEMOUND RD 1/2 MILE												MOUNT ON S-40-28 I BEAMS INCIDENTAL	18 X 10	180.00											4				
9A	E1-5P	EXIT 39												MOUNT ON SIGN # 9	9 X 2.5	22.50											4				
10	NOT USED																														
11	W1-8 (5)		36 X 48		12.000									MOUNT ON LIGHT POLE. 5 FOOT HEIGHT												4				
12	W1-8 (5)		36 X 48		12.000				1					5 FOOT HEIGHT. SEE DETAIL FOR MOUNTING TO WALL (INCIDENTAL TO POST)												4				
13	E6-5.1 MOD	100 MAYFAIR RD 108TH STREET RIGHT LANE 1/2 MILE												MOUNT ON S-40-158 I BEAMS INCIDENTAL	14 X 14.5	203.00		1									4				
13A	E1-5P	EIXT 304												MOUNT ON SIGN # 13	11 X 2.5	27.50											4				
14	W1-8 (5)		36 X 48		12.000				1					5 FOOT HEIGHT. SEE DETAIL FOR MOUNTING TO WALL (INCIDENTAL TO POST)												4				
15	W1-8 (5)		36 X 48		12.000				1					5 FOOT HEIGHT. SEE DETAIL FOR MOUNTING TO WALL (INCIDENTAL TO POST)												4				
16	W1-6 (5)		48 X 24		8.000				1					MOUNT ON BACK OF TEMP BARRIER WALL MOUNTING IS INCIDENTAL. SEE DETAIL												4				
17	W1-8 (5)		36 x 48		12.000				1					MOUNT ON BACK OF TEMP BARRIER WALL MOUNTING IS INCIDENTAL. SEE DETAIL												4				
18	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF TEMP BARRIER WALL MOUNTING IS INCIDENTAL. SEE DETAIL												4				
19	E1-1A	100 MAYFAIR ROAD 108TH ST 1/2 MILE													17 X 13.5	229.50					C	1.8	100	1200			3				
19A	E1-5P	EXIT 304												MOUNT ON SIGN # 19	10 X 2.5	25.00											3				
20	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL												3				
21	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL												3				
22	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL												3				
23	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL												3				
24	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL												3				
25	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL												3				

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Revised Sheet 1774
August 12, 2014

SHEET: 1 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1774	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCA

TYPE I &II PERMANENT SIGNING -

Category Code 1000

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1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.] x [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
26	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL														3				
27	W1-8 (5)		36 X 48		12.000				1					MOUNT ON BACK OF BARRIER WALL. MOUNTING IS INCIDENTAL. SEE DETAIL														3				
28	R2-1(5)	SPEED LIMIT 55	48 X 60	20.000					1					COVER PLAQUE INCIDENTAL.														5				
29	J4-1(6)		72 X 54	27.000					2																			1				
	MB3-1		36 X 18																													
	M1-1	IH 41	36 X 36																													
	M3-1		36 X 18																													
	M1-4	USH 45	36 X 36																													
30	E5-1A (5)	EXIT 38 A-B	96 X 84	56.000					3																			4				
31	E1-1A	59 GREENFIELD AVE 1/2 MILE													22 X 10.5	231.00					D	2.7	168	1400				4				
31A	E1-5P	EXIT 1D												MOUNT ON SIGN # 31	9 X 2.5	22.50												4				
32	E6-1 MOD	94 WEST MADISON EXIT 40 MPH EXIT ONLY												MOUNT ON S-40-43 . I BEAMS INCIDENTAL	16 X 12.5	200.00												3				
32A	E1-5P	EXIT 38B												MOUNT ON SIGN # 32	11 X 2.5	27.50												3				
33	E6-1 MOD	94 EAST MILWAUKEE EXIT 45 MPH EXIT ONLY												MOUNT ON S-40-43 I BEAMS INCIDENTAL	17 X 13	221.00		1.00										3				
33A	E1-5BP	LEFT EXIT 38A												MOUNT ON SIGN 33	11 X 4	44.00												3				
34	E5-1A MOD	EXIT 38A EXIT 38B	8 X 10	80.000						2				SEE DETAIL FOR MOUNTING TO BARRIER WALL														3				
35	E8-1	WATERTOWN PLK RD 1/2 MAYFAIR ROAD 1 3/4 NORTH AVE WEST 2 1/4												MOUNT ON S-40-44 I BEAMS INCIDENTAL TO SIGN	23 X 7.5	172.50												4				
36	D1-65 MOD	BLUEMOUND ROAD EAST - WEST	78 X 24	13.000					2																			2				
37	R2-1 (5)	SPEED LIMIT 55	48 X 60	20.000					1																			5				
38	R2-1 (5)	SPEED LIMIT 55	48 X 60	20.000										MOUNT ON COLUMN OF S-40-47 - SEE DETAIL FOR SPECIAL MOUNTING. INCIDENTAL														5				
39	NONE	MILW CO ZOO ARROW	48 X 36	12.000					1																			2				
40	NONE	CIS ARROW	36 X 36	9.000					1																			2				
41	NONE	SITE 39 CIS SYMBOL	42 X 36	10.500					1																			2				
42	NONE	2 HOUR LIMIT	24 X 18	3.000									43															2				
43	NONE	NO PARKING EXCEPT CRASH INVESTIGATION VEHICLES	42 X 36	10.500					1																			2				
44	E6-51 MOD	41 894 45 SOUTH BYPASS CHICAGO ARROWS												MOUNT ON S-40-47 I BEAMS INCIDENTAL	29 X 12	348.00		1										4				
45	E6-1 MOD	94 EAST MILWAUKEE 1/4 MILE EXIT ONLY												MOUNT ON S-40-47 I BEAMS INCIDENTAL	17 X 14	238.00												4				
45A	E1-5BP	LEFT EXIT 38A												MOUNT ON SIGN 45	11 X 4	44.00												4				
46	E6-1 MOD	94 WEST MADISON 1/4 MILE EXIT ONLY												MOUNT ON S-40-47 I BEAMS INCIDENTAL	16 X 12.5	200.00												4				
46A	E1-5P	EXIT 38B												MOUNT ON SIGN 46	11 X 2.5	27.50												4				
47	E5-1A (5)	EXIT 39 ARROW	72 X 60	30.000					2																			2				

Addendum No. 2
ID 1060-33-80
Revised Sheet 1775
August 12, 2014

SHEET: 2 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1775	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I &II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
48	W5-54 (2M)		18 X 18	2.250										MOUNT UNDER SIGN 47. SEE DETAIL														2				
49	W5-54 (2M)		18 X 18	2.250										MOUNT UNDER SIGN 47. SEE DETAIL														2				
50	W3-3 (2M)		36 X 36	9.000										MOUNT ON LIGHT POLE														2				
51	W3-3 (2M)		36 X 36	9.000					1																			2				
52	W12-1D (2M)		24 X 24	4.000					1					2 FOOT MOUNTING HEIGHT														2				
53	M1-94	BLUEMOUND ROAD	108 X 21	15.750										MOUNT ON BRIDGE . SEE DETAIL														5				
54	M1-94	BLUEMOUND ROAD	109 X 21	15.750					1					MOUNT ON BRIDGE . SEE DETAIL														5				
55	R1-1F (3)		36 X 36			7.460								ON SIGNAL POLE														2				
56	R6-3 (2M)		30 X 24	5.000									55															2				
57	R1-1F (3)					7.460								ON SIGNAL POLE														2				
58	R6-3 (2M)		30 X 24	5.000										MOUNT UNDER SIGN 55														2				
59	E6-1 MOD	94 WEST												MOUNT ON S-40-44	16 X 10.5	168.00												4				
		MADISON												I BEAMS INCIDENTAL																		
		EXIT ONLY																														
59A	E1-5P	EXIT 38B												MOUNT ON SIGN 59	11 X 2.5	27.50												4				
60	E6-1 MOD	94 EAST												MOUNT ON S-40-44	18 X 11.5	207.00		1										4				
		MILWAUKEE												I BEAMS INCIDENTAL																		
		EXIT ONLY																														
60A	E1-5BP	LEFT												MOUNT ON SIGN 60	11 X 4	44.00												4				
		EXIT 38A																														
61	NONE	41 894 45												MOUNT ON S-40-44	29 X 12	348.00		1										4				
		BYPASS												I BEAMS INCIDENTAL																		
		CHICAGO																														
		DOWN ARROWS																														
62	R1-2 (2S)		36 X 31	3.880					1																			2				
63	W1-6 (3)		60 X 30		12.500				1																			4				
64	JV2-1(2S)		96 X 24	16.000						1		1		COVER SIGN . LEAVE IN PLACE														2				
	MB4-5		24 X 12																													
	MB3-3		24 X 12																													
	M1-1	IH 41	24 X 24																													
	M1-6	USH 45	24 X 24																													
	M4-20L	USE LEFT LANE	24 X 24																													
65	R7-1D (2S)		18 X 24	3.000							1																	2				
66	R1-1 (3)		36 X 36	7.460							1																	2				
67	R1-1 (3)		36 X 36	7.460							1																	2				
68	R7-1D (2S)		18 X 24	3.000							1																	2				
69	NONE	NORTH 41 45												MOUNT ON S-40-99 1 I BEAMS INCIDENTAL	5 X 9.5	47.50		1.00										2				
		ONLY																														
		ARROW																														
70	R5-1(3)		36 X 36	9.000					1																			2				
71	R5-1(3)		36 X 36	9.000					1																			2				
72	JV2-1 (2S)		81 X 24	13.500					1			1		COVER PLAQUE TO REMAIN AT END OF PROJECT														2				
	MB3-1		24 X 12																													
	M1-1	IH 41	24 X 24																													
	M1-4	USH 45	24 X 24																													
	MB5-1L		21 X 21																													
73	R5-1(3)		36 X 36						1																			2				
74	R5-1(3)		36 X 36						1																			2				
75	J3-1(2S)		81 X 24	13.500					1			1		COVER PLAQUE TO REMAIN AT END														2				
	MB3-1		24 X 12											OF PROJECT																		
	M1-1	IH 41	24 X 24																													
	M1-6	USH 45	24 X 24																													
	MB6-1		21 X 21																													
76	R5-1(3)		36 X 36	9.000					1																			2				
77	R5-1(3)		36 X 36	9.000					1																			2				
78	R5-1A (3)		42 X 30	8.750										MOUNT UNDER SIGN 80 AT 3 FOOT MOUNTING HEIGHT														2				
79	R5-1A (3)		42 X 30	8.750										MOUNT UNDER SIGN 81 AT 3 FOOT MOUNTING HEIGHT														2				
80	R5-1 (3)		36 X 36	9.000					1																			2				
81	R5-1 (3)		36 X 36	9.000										ON SIGNAL POLE														2				
82	R6-2L (2M)		24 X 30	5.000										ON SIGNAL POLE														2				

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TYPE I&II PERMANENT SIGNING -

Category Code 1000

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1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.] x [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.] x [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
83	W5-56(2S)		18 X 18	2.250							1			5 FOOT MOUNTING HEIGHT													2				
84	W5-56(2S)		18 X 18	2.250							1			5 FOOT MOUNTING HEIGHT													2				
85	JV4-1 (2S)		93 X 24	15.500					1																		2				
	MB4-5		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB6-1		21 X 21																												
	M3-4		24 X 12																												
	M1-4	USH 18	24 X 24																												
86	R4-7 (2S)		24 X 30	5.000							1																2				
87	R4-7 (2S)		24 X 30	5.000							1																2				
88	R5-1 (2S)		30 X 30	6.250							1			MOUNT NEXT TO STOP SIGN NOT ON BACK													2				
89	R7-1D (2S)		18 X 24	3.000							1																2				
90	J3-1 (2S)		81 X 24	13.500					1			1		LEAVE COVER PLAQUE IN PLACE													2				
	MB3-3		24 X 12											AFTER PROJECT																	
	M1-1	IH 41	24 X 24																												
	M1-4	USH 45	24 X 24																												
	MB6-1		21 X 21																												
91	R3-1 (2M)		36 X 36	9.000							1																2				
92	J3-1(2S)		57 X 24	9.500					1					MOUNT ACROSS FROM ZOO EXIT													2				
	MB4-5		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB6-1		21 X 21																												
93	R7-1D (2S)		18 X 24	3.000							1																2				
94	J3-1 (2S)		57 X 24	9.500					1																		2				
	MB4-5		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB6-1		21 X 21																												
95	R1-1 (2S)		30 X 30	5.180							1																2				
96	R2-1(2S)	SPEED LIMIT 35	24 X 30	5.000							1																2				
97	D1-61(2S)	95TH STREET	54 X 24	9.000							2																2				
		ARROWS																													
98	J4-1 (2S)		36 X 24	6.000										ON LIGHT POLE													2				
	M3-2		24 X 12																												
	M1-4	USH 18	24 X 24																												
99	W3-3 (2S)		36 X 36		9.000						1																2				
100	W3-3 (2S)		36 X 36		9.000									ON LIGHT POLE													2				
101	R1-1(2S)		30 X 30	5.180							1																2				
102	J2-2 (2S)		93 X 48	31.000						2		1															2				
	MB4-5		24 X 12																												
	MB3-3		24 X 12																												
	M1-1	IH 41	24 X 24																												
	M1-6	USH 45	24 X 24																												
	MB6-1		21 X 21																												
	MB4-5		24 X 12																												
	MB3-1		24 X 12																												
	M1-1	IH 41	24 X 24																												
	M1-4	USH 45	24 X 24																												
	MB6-1		21 X 21																												
103	J3-1 (2S)		57 X 24	9.500					1																		2				
	MB4-5		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB6-1		21 X 21																												
104	R4-7(2S)		24 X 30	5.000							1																2				
105	R1-1(2S)		30 X 30	5.180										ON BACK OF SIGN 104													2				
106	R1-1(2S)		30 X 30	5.180							1																2				
107	NONE	SOUTH												MOUNT ON S-40-992	5 X 9.5	47.50		1.00								2				
		41-45												I BEAMS INCIDENTAL																	
		ONLY																													
		ARROW																													
108	R5-1 (2S)		30 X 30	5.000										MOUNT ON BACK OF STOP SIGN. TRIM TO OCTAGON SHAPE INCIDENTAL													2				

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TYPE I&II PERMANENT SIGNING -

Category Code 1000

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1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W [IN.] x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22'	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W [FT.] x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
109	J3-1 (2S)		81 X 24	13.500					1			1		COVER SIGN AND LEAVE COVERED AT												2				
	M83-1		24 X 12											END OF PROJECT																
	M1-1	IH 41	24 X 24																											
	M1-4	USH 45	24 X 24																											
	M86-1		21 X 21																											
110	R4-7 (2S)		24 X 30	5.000							1															2				
111	R4-7 (2S)		24 X 30	5.000							1															2				
112	R6-2R (2S)		24 X 30	5.000							1															2				
113	R1-1 (2S)		30 X 30	5.180							1															2				
114	R6-3A (2S)		30 X 24	5.000									113													2				
115	JV4-2 (5)		108 X 36	27.000										MOUNT ON COLUMN OF S-40-50												3				
	M83-3		36 X 18											SEE DETAIL																
	M1-1	IH 41	36 X 36																											
	M3-3		36 X 18																											
	M1-4	USH 45	36 X 36																											
116	NOT USED																													
116A	NOT USED																													
117	E6-1 MOD	18												MOUNT ON S-40-51	15 X 12.5	187.50										3				
		BLUEMOUND RD												I BEAMS INCIDENTAL																
		EXIT ONLY																												
117A	E5-1P	EXIT 39												MOUNT ON SIGN 117	9 X 2.5	22.50										3				
118	NOT USED																													
119	R3-33R													MOUNT UNDER SIGN 120	6.5 X 3	19.50										3				
120	NONE	BLUEMOUND RD												11 FOOT MOUNT HEIGHT	22 X 7	154.00						B	1.6	98	1000	3				
		2 RIGHT LANES																												
121	NONE	18												MOUNT ON S-40-50	27 X 12	324.00										3				
		BLUEMOUND RD												I BEAMS INCIDENTAL																
		EXIT ONLY - OPTION LANE																												
121A	E1-5P	EXIT 39												MOUNT ON SIGN 121	9 X 2.5	22.50										3				
122	W14-2(2S)		30 X 30		6.250						1															2				
123	W4-3L (5)		48 X 48		16.000									ON LIGHT POLE												3				
124	W4-3R (5)		48 X 48		16.000				1																	3				
125	E1-1A	100 NORTH													23 X 14	322.00						D	1.8	112	1400	5				
		NORTH AVE EAST																												
		3/4 MILE																												
125A	E1-5P	EXIT 42A												MOUNT ON SIGN 125	11 X 2.5	27.50										5				
126	E6-51 MOD	WATERTOWN PLK RD												MOUNT ON S-40-65	20 X 6.5	130.00										2				
		EXIT ONLY												I BEAMS INCIDENTAL																
126A	E1-5P	EXIT 40 A-B												MOUNT ON SIGN 126	14 X 2.5	35.00										2				
127	NOT USED		54 X 36																											
	NOT USED		36 X 18																											
	NOT USED	IH 94	36 X 36																											
128	NOT USED													ON LIGHT POLE																
129	NOT USED																													
130	NOT USED																													
130A	NOT USED																													
131	NOT USED																													
131A	NOT USED																													

Addendum No. 2
ID 1060-33-80
Revised Sheet 1778
August 12, 2014

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1778	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I&II PERMANENT SIGNING -

Category Code 1000

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1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.] x [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.] x [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
132	E8-1	84TH STREET 3/4												MOUNT ON S-40-788	21 X 7.5	157.50											2				
		68TH-70TH ST 2 1/4												I BEAMS INCIDENTAL																	
		HAWLEY RD 3																													
133		TO GREENFIELD AVE	78 X 39	21.250					2	2															2		5				
134		NOT USED																													
135	NONE	TO GEN MITCHELL					3			3				PLACE ON WOOD POST					1								2				
		INTL AIRPORT												SEE STATE PLATE A5-7																	
		EXIT 305A																													
136	NONE	RAMP												BEACONS - SEE ELECTRICAL PLAN	14 X 6	84.00											3				
		25 MPH												MOUNT ON S-40-146																	
		LOOP ARROW												I BEAMS INCIDENTAL																	
137	W1-8(5)						1	1	1					MOUNT AT 5' HEIGHT													3				
138	W1-8 (5)						1	1	1																		3				
139	W3-3						1	1	1																		3				
140	NONE	MILW CO					2	1	2																		3				
		ZOO (ARROW LEFT)																													
141	J4-1(5)		54 X 36	13.500					1																		4				
	MB3-4		36 X 18																												
	M1-1	IH 94	36 X 36																												
142	NONE	GAS - FOOD	48 X 42	14.000					2																		3				
		LODGING																													
		ARROWS																													
143	NONE	100 SOUTH												MOUNT ON S-40-87	14 X 10	140.00											3				
		108TH STREET												I BEAMS INCIDENTAL																	
		DOWN ARROW																													
144	NONE	100 NORTH												MOUNT ON S-40-87	14 X 10	140.00											3				
		MAYFAIR RD												I BEAMS INCIDENTAL																	
		DOWN ARROW																													
145	W13-2A (2M)	25 MPH	48 X 90		30.000					1																	3				
146	W1-13RL (5)		48 X 48		16.000				1																		4				
147	W13-1 (5)		36 X 36		9.000								146														4				
148	E5-1A (5)		114 X 60	47.500						3																	4				
149	W1-8 (5)		36 X 48		12.000				1					5 FOOT MOUNTING HEIGHT ON BACK													4				
														OF TEMP BARRIER WALL . SEE DETAIL																	
150	W1-8(5)		36 X 48		12.000				1					5 FOOT MOUNTING HEIGHT ON BACK													4				
														OF TEMP BARRIER WALL . SEE DETAIL																	
151	W1-8 (5)		36 X 48		12.000				1					5 FOOT MOUNTING HEIGHT ON BACK													4				
														OF TEMP BARRIER WALL . SEE DETAIL																	
152	W1-8 (5)		36 X 48		12.000						1			5 FOOT MOUNTING HEIGHT ON TOP													4				
														OF BARRIER WALL - SEE DETAIL																	
153	W1-8 (5)		36 X 48		12.000						1			5 FOOT MOUNTING HEIGHT ON TOP													4				
														OF BARRIER WALL - SEE DETAIL																	
154	W1-8 (5)		36 X 48		12.000						1			5 FOOT MOUNTING HEIGHT ON TOP													4				
														OF BARRIER WALL - SEE DETAIL																	
155	NONE	MERGING TRAFFIC	96 X 48		32.000					2																	4				
156	E6-1 MOD	100												MOUNT ON S-40-104	16 X 12.5	200.00											3				
		MAYFAIR RD												I BEAMS INCIDENTAL																	
		108TH STREET																													
		EXIT ONLY																													
156A	E1-5P	EXIT 304												MOUNT ON SIGN 156	11 X 2.5	27.50											3				
157	E6-1 MOD	94 WEST												MOUNT ON S-40-104	18 X 10	180.00											3				
		MADISON												I BEAMS INCIDENTAL																	
		DOWN ARROWS																													
158	W1-8 (5)		36 X 48		12.000				1					5 FOOT HEIGHT ON BACK OF BARRIER													1				
														WALL - SEE DETAIL																	
159	W1-8 (5)		36 X 48		12.000				1					5 FOOT HEIGHT ON BACK OF BARRIER													1				
														WALL - SEE DETAIL																	
160	W1-8 (5)		36 X 48		12.000				1					5 FOOT HEIGHT ON BACK OF BARRIER													1				
														WALL - SEE DETAIL																	

Addendum No. 2
ID 1060-33-80
Revised Sheet 1779
August 12, 2014

SHEET: 6 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1779	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCAL

TYPE I &II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.] x [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.] x [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
161	E5-1B (5)	EXIT 1A	78 X 60		32.500					2																	1				
162	PLAQUE	25 MPH	72 X 24		12.000								161														1				
163	R3-3 (5)		48 X 48	16.000					1																		1				
164	W1-8(5)		36 X 48		12.000				1					5 FOOT HEIGHT ON BACK OF BARRIER WALL - SEE DETAIL													1				
165	W1-8 (5)		36 X 48		12.000				1					5 FOOT HEIGHT ON BACK OF BARRIER WALL - SEE DETAIL													1				
166	W1-6(2S)		48 X 24		8.000						2																3				
167	R7-1D (2S)		18 X 24	3.000										MOUNT ON NOISE WALL - SEE DETAIL													3				
168	W1-6(4)		60 X 30		12.500				2																		2				
169	R7-1D (2S)		18 X 24	3.000										MOUNT ON NOISE WALL - SEE DETAIL													3				
170	W14-1(2S)		30 X 30		6.250						1																3				
171	R1-1 (2S)		30 X 30	5.180							1																3				
172	W14-1(2S)		30 X 30		6.250						1																3				
173	R1-1 (2S)		30 X 30	5.180							1																3				
174	W14-1(2S)		30 X 30		6.250						1																3				
175	R1-1 (2S)		30 X 30	5.180							1																3				
176	R7-1D (2S)		18 X 24	3.000							1																3				
177	R1-1 (2S)		30 X 30	5.180							1																3				
178	R1-3P (2M)		24 X 9	1.500									177														3				
179	R1-1 (2S)		30 X 30	5.180							1																3				
180	R1-3P (2M)		24 X 9	1.500									179														3				
181	R1-1 (2S)		30 X 30	5.180							1																3				
182	R1-3P (2M)		24 X 9	1.500									181														3				
183	R1-1 (2S)		30 X 30	5.180							1																3				
184	R1-3P (2M)		24 X 9	1.500									183														3				
185	R1-1 (2S)		30 X 30	5.180							1																3				
186	R1-3P (2M)		24 X 9	1.500									185														3				
187	R4-7(2S)		24 X 30	5.000										MOUNT ON BACK OF STOP SIGN													3				
188	R4-7(2S)		24 X 30	5.000										MOUNT ON BACK OF STOP SIGN													3				
189	W5-52L (2S)		12 X 36		3.000								187														3				
190	W5-52L (2S)		12 X 36		3.000								188														3				
191	R1-1(2S)		30 X 30	5.180							1																3				
192	R1-3P (2M)		24 X 9	1.500									191														3				
193	R2-1(2S)	25 MPH	24 X 30	5.000							1																3				
194	R1-1(2S)		30 X 30	5.180							1																3				
195	W14-1(2S)		30 X 30		6.250						1																3				
196	R5-1(2S)		30 X 30	6.250							1			SHEET 27A													3				
197	R5-1A(2S)		36 X 24	6.000							1			SHEET 27A													3				
198	NOT USED																														
199	R2-1(2S)	SPEED LIMIT 25	24 X 30	5.000							1																3				
200	J4-1(5)		54 X 36	13.500					1					BACK OF BARRIER WALL - SEE DETAIL													2				
	MB3-2		36 X 18																												
	M1-1	IH 94	36 X 36																												
201	E6-1 MOD	41 45 NORTH FOND DU LAC EXIT ONLY												MOUNT ON S-40-117 I BEAMS INCIDENTAL	17 X 11.5	195.50		1									3				
201A	E1-5P	EXIT 305B												MOUNT ON SIGN 201	13 X 2.5	32.50											3				
202	E6-1 MOD	41 894 45 SOUTH CHICAGO EXIT ONLY												MOUNT ON S-40-117 I BEAMS INCIDENTAL	19 X 10.5	199.50		1									3				
202A	E1-5BP	LEFT EXIT 305A												MOUNT ON SIGN 202	13 X 4	52.00											3				
203	E6-1 MOD	94 WEST MADISON DOWN ARROWS												MOUNT ON S-40-117 I BEAMS INCIDENTAL	17 X 10	170.00											3				
204		NO WESTERLY OUTLET					1	1			1																3				

Addendum No. 2
ID 1060-33-80
Revised Sheet 1780
August 12, 2014

SHEET: 7 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1780	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I&II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W [IN.] x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W [FT.] x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
205	J3-1(S)		120 X 36	30.000										MOUNT ON LIGHT POLE													3				
	MB4-5		36 X 18																												
	M1-1	IH 41	36 X 36																												
	M1-4	USH 45	36 X 36																												
	M6-2		30 X 30																												
206	E5-1B(5)	EXIT 305B	114 X 60	47.500						3																	2				
207	M1-9-4	92ND STREET	96 X 21	14.000										MOUNT ON BRIDGE SEE DETAIL													4				
208	M1-9-4	92ND STREET	96 X 21	14.000										MOUNT ON BRIDGE SEE DETAIL													4				
209	W14-2(2S)(MOD)	NO THROUGH STREET	30 X 30		6.250						1																3				
210	R1-1(2S)		30 X 30	5.180							1																3				
211	R1-3P (2M)		24 X 9	1.500									210														3				
212	R1-1(2S)		30 X 30	5.180							1																3				
213	R1-3P (2M)		24 X 9	1.500									212														3				
214	R4-7(2S)		24 X 30	5.000										MOUNT ON BACK OF STOP SIGN													4				
215	W5-52L (2S)		12 X 36		3.000								214														4				
216	R4-7(2S)		24 X 30	5.000										MOUNT ON BACK OF STOP SIGN													4				
217	W5-52L (2S)		12 X 36		3.000								216														4				
218	R2-1 (2S)	30 MPH	24 X 30	5.000							1																3				
219	R1-1(2S)		30 X 30	5.180							1																3				
220	R1-3P (2M)		24 X 9	1.500									219														3				
221	R1-1(2S)		30 X 30	5.180							1																3				
222	R1-3P (2M)		24 X 9	1.500									221														3				
223	R1-1(2S)		30 X 30	5.180							1																3				
224	R1-3P (2M)		24 X 9	1.500									223														3				
225	R5-1(2S)		30 X 30	6.250							1			SHEET 27B													3				
226	W1-6 (2S)		48 X 24		8.000						2																3				
227	E5-1A (5)	EXIT 306	90 X 60	37.500					2																		4				
228	W14-1 (2S)		30 X 30		6.250						1																3				
229	W14-1 (2S)		30 X 30		6.250						1																3				
230	R1-1(2S)		30 X 30	5.180							1																3				
231	R1-1(2S)		30 X 30	5.180							1																3				
232	W14-1 (2S)		30 X 30		6.250						1																3				
233	R1-1(2S)		30 X 30	5.180							1																3				
234	E8-1	68TH - 70TH ST 1 HAWLEY RD 1 3/4 MITCHELL BLVD LEFT 2 1/4												MOUNT ON S-40-789 I BEAMS INCIDENTAL	24 X 7.5	180.00											3				
235	R1-1 (2S)		30 X 30	5.180							1																3				
236	W3-3(2M)		36 X 36		9.000				1																		3				
237	W14-1(2S)		30 X 30		6.250						1																3				
238	R1-1 (2S)		30 X 30	5.180							1																3				
239	W9-63 MODIFIED	3/4 MILE												MOUNT ON S-40-118 I BEAMS INCIDENTAL USE TYPE I SIGN IN LIEU OF TYPE II	6 X 7.5		67.50										4				
240	W4-2 (2M)		36 X 36		9.000									MOUNT ON UPRIGHT OF OVERHEAD SIGN SUPPORT													2				
241	NONE	GREEN BAY TRAFFIC FOLLOW 41 45 NORTH												MOUNT ON S-40-121 I BEAMS INCIDENTAL	19 X 11.5	218.50		1									3				
242	E6-1 MOD	94 WEST MADISON DOWN ARROW												MOUNT ON S-40-121 I BEAMS INCIDENTAL	12 X 10	120.00											3				
243	E6-1 MOD	41 894 45 CHICAGO FOND DU LAC DOWN ARROW												MOUNT ON S-40-121 I BEAMS INCIDENTAL	14 X 12.5	175.00		1									3				
244	R10-65C (2M)		24 X 30	5.000										MOUNT ON S-40-989													2				
												1		MOUNTING BRACKETS INCIDENTAL																	
245	R10-65R(2M)		24 X 30	5.000										MOUNT ON S-40-989 MOUNTING BRACKETS INCIDENTAL													2				
246	NONE	DO NOT CROSS OVER TO HWY 41/ 894 SOUTH												MOUNT ON S-40-116 I BEAMS INCIDENTAL	16 X 9	144.00											3				

Addendum No. 2
ID 1060-33-80
Revised Sheet 1781
August 12, 2014

TYPE I&II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.] x [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W [FT.] x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
247	E6-1 MOD	41 45 NORTH FOND DU LAC EXIT ONLY												MOUNT ON S-40-116 I BEAMS INCIDENTAL	17 X 11.5	195.50		1									3				
247A	E1-5P	EXIT 305B												MOUNT ON SIGN 247	13 X 2.5	32.50											3				
248	E6-1 MOD	41 894 45 SOUTH CHICAGO EXIT ONLY												MOUNT ON S-40-116 I BEAMS INCIDENTAL	19 X 10.5	199.50		1									3				
248A	E1-5BP	LEFT EXIT 305A												MOUNT ON SIGN 248	13 X 4	52.00											3				
249	E6-1 MOD	94 WEST MADISON DOWN ARROWS												MOUNT ON S-40-116 I BEAMS INCIDENTAL	17 X 10	170.00											3				
250	J4-1 (5) MB3-4 M1-1	IH 94	54 X 36 36 X 18 36 X 36	13.500										ON LIGHT POLE													3				
251	NOT USED																														
252	NOT USED																														
253	NONE	3-6 PM	24 X 12	2.000									254														3				
254	R3-1(2S)		24 X 24	4.000							1																3				
255	R1-1 (2S)		30 X 30	5.180							1																3				
256	W14-1 (2S)		30 X 30		6.250						1																3				
257	R1-1 (2S)		30 X 30	5.180							1																3				
258	W1-6(2S)		48 X 24		8.000						2																3				
259	R2-1(2S)	25 MPH	24 X 30	5.000							1																3				
260	W14-1 (2S)		30 X 30		6.250						1																3				
261	R1-1 (2S)		30 X 30	5.180							1																3				
262	R3-5R		42 X 48	14.000										MOUNT ON S-40-147													4				
263	R3-6		42 X 48	14.000										MOUNTING BRACKETS INCIDENTAL MOUNTING BRACKETS INCIDENTAL MOUNT ON S-40-147													4				
264	R3-5L		42 X 48	14.000										MOUNT ON S-40-147 MOUNTING BRACKETS INCIDENTAL													4				
265	W1-8(2S)		18 X 24		3.000						1																3				
266	W1-8(2S)		18 X 24		3.000						1																3				
267	W1-8(2S)		18 X 24		3.000						1																3				
268	W9-6 2 MODIFIED													TYPE I SIGN IN LIEU OF TYPE II SIGN I BEAMS INCIDENTAL	6 X 7.5		45.00										4				
269	E1-1A	68TH STREET 70TH STREET 3/4 MILE													19 X 9.5	180.50						B	1.6	98	1000			4				
269A	E1-5P	EXIT 307A												MOUNT ON SIGN 269	12 X 2.5	30.00											4				
270	W5-58L (2M)		36 X 36		9.000									MOUNT ON FRONT OF CRASH CUSHION												2				
271	W3-8		48 X 48		16.000									MOUNT ON SIGNAL POLE												4				
272	W5-58L (2M)		36 X 36		9.000									MOUNT ON FRONT OF CRASH CUSHION												4				
273	R7-1D (2S)		18 X 24		3.000						1																4				
274	NONE	KEARNEY ST ARROW RIGHT												GROUND MOUNT	10.5 X 4	42.00						A	1.2	68	600			4				
275	E6-1 MOD	94 EAST MILWAUKEE DOWN ARROWS												MOUNT ON S-40-124 I BEAMS INCIDENTAL	16 X 9	144.00											4				
276	NONE	CIS	36 X 36	9.000					1																		4				
277	D4-2R(2M)		30 X 36	7.500					1																		4				
278	R1-1(3)		36 X 36	7.460							1																4				
279	R7-1D(2S)		18 X 24	3.000							1																4				
280	D9-2(2S)		24 X 24	4.000									282														2				
281	MB6-1(2S)		21 X 21	3.060									282														2				
282	NONE	WISCONSIN LUTHERAN COLL.	42 X 48	14.000					2																		2				
283	M1-94	ARROW RIGHT 84TH STREET	96 X 21	14.000										MOUNT ON BRIDGE - SEE DETAIL													5				
284	M1-94	84TH STREET	96 X 21	14.000										MOUNT ON BRIDGE - SEE DETAIL													5				
285	E6-1 MOD	NORTH 41 45 FOND DU LAC 1/2 MILE DOWN ARROW												MOUNT ON S-40-122 I BEAMS INCIDENTAL	14 X 14.5	203.00		1									2				

Addendum No. 2
ID 1060-33-80
Revised Sheet 1782
August 12, 2014

SHEET: 9 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1782	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I&II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
285A	E1-5P	EXIT 305B												MOUNT ON SIGN 285	13 X 2.5	32.50											2				
286	E6-1 MOD	SOUTH 41 894 45 CHICAGO 1/2 MILE DOWN ARROW												MOUNT ON S-40-122 I BEAMS INCIDENTAL	14 X 14.5	203.00		1									2				
286A	E1-5BP	LEFT EXIT 305A												MOUNT ON SIGN 286	13 X 4	52.00											2				
287	E6-1 MOD	94 WEST MADISON DOWN ARROWS												MOUNT ON S-40-122 I BEAMS INCIDENTAL	18 X 10	180.00											2				
288	W4-1(5)		48 X 48		16.000									MOUNT ON UPRIGHT OF S-40-119													2				
289	E6-5.1 MOD	100 MAYFAIR RD 108TH STREET 1 MILE												SEE DETAIL MOUNT ON S-40-119 I BEAMS INCIDENTAL	14 X 12	168.00											2				
289A	E1-5P	EXIT 304																									2				
290	R5-57(3)		36 X 36	9.000					1					MOUNT ON SIGN 289	11 X 2.5	27.50											4				
291	R3-5L(2M)		42 X 48	14.000										MOUNT ON S-40-148													2				
292	R3-5A(2M)		42 X 48	14.000										MOUNTING BRACKETS INCIDENTAL MOUNT ON S-40-148													2				
293	R3-5R(2M)		42 X 48	14.000										MOUNTING BRACKETS INCIDENTAL MOUNT ON S-40-148													2				
294	D4-2A(2M)		30 X 36	7.500						1				MOUNTING BRACKETS INCIDENTAL													4				
295	NONE	CIS	36 X 36	9.000									294														4				
296	NONE	STATE FAIR ARROW RIGHT	90 X 66	41.250						2																	4				
297	D9-2(2S)		24 X 24	4.000									296														4				
298	MB6-1		21 X 21	3.060									296														4				
299	D1-60	84TH STREET	90 X 24	15.000						2																	4				
300	J3-1(2S) M1-6 M6-4	NORTH SOUTH	45 X 24 24 X 24 21 X 21	7.500									299														4				
301	NONE	PETTIT CENTER ARROW RIGHT	66 X 42	19.250					2																		4				
302	W12-1D(2M)		24 X 24		4.000				1					2 FOOT MOUNTING HEIGHT													4				
303	S1-1 (2M)		36 X 36		6.750									UP HIGH ON SIGNAL POLE													4				
304	S16-7L (2M)		30 X 18		3.750								303														4				
305	W12-1D(2M)		24 X 24		4.000				1					2 FOOT MOUNTING HEIGHT													4				
306	R1-1F(3)		36 X 36			7.460								MOUNT ON SIGNAL POLE													4				
307	R1-1F(3)		36 X 36			7.460								MOUNT ON SIGNAL POLE													4				
308	S1-1 (2M)		36 X 36		6.750									UP HIGH ON SIGNAL POLE													4				
309	S16-7L (2M)		30 X 18		3.750								308														4				
310	S1-1 (2M)		36 X 36		6.750									ON UPRIGHT OF S-40-147													4				
311	S16-9P (2M)		30 X 18		3.750								310														4				
312	S1-1 (2M)		36 X 36		6.750									ON UPRIGHT OF S-40-147													4				
313	S16-9P (2M)		30 X 18		3.750								312														4				
314	R5-57(3)		36 X 36	9.000										ON LIGHT POLE													2				
315	R10-6(2S)		24 X 36	6.000										MOUNT ON SIGNAL POLE													2				
316	R10-10(2S)		24 X 30	5.000										MOUNT ON SIGNAL POLE													2				
317	J4-1(2S)		36 X 24	6.000					1																		4				
318	M3-3 M1-6 R6-2L (2S)	STH 181	24 X 12 24 X 24 24 X 30	5.000										MOUNT ON SIGNAL POLE													4				
319	R6-2R (2S)		24 X 30	5.000					1																		4				
320	R3-2(2S)		24 X 24	4.000							1																4				
321	R1-1F(3)		36 X 36			7.460								ON SIGNAL POLE													4				
322	R1-1F(3)		36 X 36			7.460								ON SIGNAL POLE													4				
323	J3-1 (2S) MB3-2 M1-1 M1-6	IH 94	57 X 24 24 X 12 24 X 24 21 X 21	9.500 4.000					1																		4				

Addendum No. 2
ID 1060-33-80
Revised Sheet 1783
August 12, 2014

SHEET: 10 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1783	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCAL

TYPE I&II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W [IN.] x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.] x [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
324	R4-7(2S)		24 X 30	5.000							1																4				
325	R7-1D (2S)		18 X 24	3.000							1																4				
326	NONE	WEST 94 ONLY ARROW DOWN	60 X 84	35.000										MOUNT ON S-40-993 I BEAMS INCIDENTAL												4				
327	R1-2(2S)		36 X 31	3.880							1																4				
328	R4-7(2S)		24 X 30	5.000										ON SIGNAL POLE													4				
329	W12-2(2S)		36 X 36		9.000						2																4				
330	W5-52L(2S)		18 X 36		3.000								324														4				
331	R6-2L(2S)		24 X 30	5.000									329														4				
332	R4-7(2S)		24 X 30	5.000							1																4				
333	W5-52L(2S)		18 X 36		3.000								332														4				
334	J2-3(2S)		60 X 48	20.000					2																		4				
	MB3-2		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB5-1R		21 X 21																												
	M3-1		24 X 12																												
	M6-1	STH 181	24 X 24																												
	M6-1		21 X 21																												
	MB3-4		24 X 12																												
	M1-1	IH 94	24 X 24																												
	M4-20L		24 X 24																												
335	J3-1(2S)		57 X 24	9.500					1																		4				
	MB3-2		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB6-1		21 X 21																												
336	R6-2L(2S)		24 X 30	5.000							1																4				
337	R5-1 (3)		36 X 36	9.000										ON SIGNAL POLE													4				
338	R5-1A(2S)		36 X 24	6.000										ON SIGNAL POLE 3 FOOT MOUNTING HEIGHT													4				
339	R5-1(3)		36 X 36	9.000										ON SIGNAL POLE													4				
340	R5-1A(2S)		36 X 24	6.000										ON SIGNAL POLE 3 FOOT MOUNTING HEIGHT													4				
341	R3-1(2S)		24 X 24	4.000							1																4				
342	R4-7(2S)		24 X 30	5.000										ON SIGNAL POLE													4				
343	R7-1D (2S)		18 X 24	3.000							1																4				
344	R5-1(2S)		30 X 30	6.250							1																4				
345	R4-7(2S)		24 X 30	5.000										ON SIGNAL POLE													4				
346	R3-2(2S)		24 X 24	4.000										ON SIGNAL POLE UNDER R4-7													4				
347	J2-1 (2S)		57 X 24	9.500					1																		4				
	MB3-2		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB5-1L		21 X 21																												
348	J2-1 (2S)		57 X 24	9.500					1																		4				
	MB3-4		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB5-1L		21 X 21																												
349	J3-1(2S)		57 X 24	9.500					1																		4				
	MB3-4		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB6-1		21 X 21																												
350	R3-1 (2S)		24 X 24	4.000							1																2				
351	R6-2L(2S)		24 X 30	5.000										ON SIGNAL POLE													2				
352	R3-2(2S)		24 X 24	4.000									350														2				
353	R7-1D (2S)		18 X 24	3.000							1																4				
354	R1-1F (3)		36 X 36			7.460								ON SIGNAL POLE													2				
355	R1-1F (3)		36 X 36			7.460			1																		2				
356		NO ENGINE BRAKING					1	1			1																4				
357	D1-60	84TH STREET SOUTH NORTH	90 X 24	15.000					2																		2				

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1784
August 12, 2014

SHEET: 11 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1784	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I&II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.] x [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.] x [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
358	J2-2 (2S)		57 X 48	19.000					1																	2				
	M3-3		24 X 12																												
	M1-6	STH 181	24 X 24																												
	M5-1L		21 X 21																												
	M3-1		24 X 12																												
	M1-6	STH 181	24 X 24																												
	M5-1R		21 X 21																												
359	R5-1A(3)		42 X 30	8.750					1					MOUNT ON LIGHT POLE												2				
360	R5-1A(3)		42 X 30	8.750																						2				
361	R1-2 (2S)		36 X 31	3.880					1																	2				
362	W12-1D (2S)		24 X 24		4.000				1					2 FOOT MOUNTING HEIGHT												2				
363	R3-18(2S)		24 X 24	4.000										ON SIGNAL POLE												4				
364	R1-1F (3)		36 X 36			7.460								ON SIGNAL POLE												2				
365	R1-1F (3)		36 X 36			7.460								ON SIGNAL POLE												2				
366	J3-1 (2S)		60 X 24	10.000					1																	2				
	MB3-2		24 X 12																												
	M1-1	IH 94	24 X 24																												
	M4-20L		24 X 24																												
367	R1-2 (2S)		36 X 31	3.880					1																	2				
368	J3-1 (2S)		57 X 24	9.500					1																	2				
	MB3-4		24 X 12																												
	M1-1	IH 94	24 X 24																												
	MB6-1		21 X 21																												
369	R5-1(3)		36 X 36	9.000										ON SIGNAL POLE												2				
370	R5-1A(2S)		36 X 24	6.000										ON SIGNAL POLE												2				
														3 FOOT MOUNTING HEIGHT																
371	R5-1 (3)		36 X 36	9.000										ON SIGNAL POLE												2				
372	R5-1A (2S)		36 X 24	6.000										ON SIGNAL POLE												2				
														3 FOOT MOUNTING HEIGHT																
373	R3-51R(2M)		48 X 78	26.000										ON LIGHT POLE												4				
374	R2-1(2S)		24 X 30	5.000							1															4				
375	R10-10(2S)		24 X 30	5.000										ON SIGNAL POLE												4				
376	R10-6(2S) MODIFIED	ARROW DOWN LEFT	24 X 30	5.000										ON SIGNAL POLE												4				
377	R10-6(2S)		24 X 30	5.000										ON SIGNAL POLE												4				
378	R10-10R(2S)		24 X 30	5.000										ON SIGNAL POLE												4				
379	W4-3(5)		48 X 48		16.000					1																4				
380	R7-1D(2S)		18 X 24	3.000										ON LIGHT POLE												4				
381	R8-7(S)		48 X 36	12.000										ON LIGHT POLE												4				
382	R8-7(S)		48 X 36	12.000										ON LIGHT POLE												4				
383	E8-1	68TH - 70TH ST 1/4												MOUNT ON S-40-790	23 X 8	184.00										4				
		HAWLEY RD 1												I BEAMS INCIDENTAL																
		MITCHELL BLVD LEFT 1 1/2																												
384	W4-3L (2M)		36 X 36		9.000						1															4				
385	R7-1D (2S)		18 X 24	3.000							1															4				
386	R6-2R(2S)		24 X 30	5.000										ON LIGHT POLE												2				
387	NONE	WISCONSIN												MOUNT ON S-40-134	17 X 7	119.00										2				
		LUTHERN COLLEGE												I BEAMS INCIDENTAL																
		EXIT 306																												
388	R1-1(2S)		30 X 30	5.180							1															2				
389	R2-1(2S)	SPEED LIMIT 30	24 X 30	5.000							1															2				
390	E8-1	84TH ST 1/4												MOUNT ON S-40-790	23 X 8	184.00		1								4				
		41 894 45 1												I BEAMS INCIDENTAL																
		100 MAYFAIR ROAD 1 1/2																												
391	R1-1 (2S)		36 X 36	5.180							1															2				
392	E6-1 MOD	181												MOUNT ON S-40-129	16 X 11	176.00										2				
		84TH STREET												I BEAMS INCIDENTAL																
		EXIT ONLY																												
392A	E1-5P	EXIT 306												MOUNT ON SIGN 392	11 X 2.5	27.50										2				
393	R2-1(2S)	SPEED LIMIT 30	24 X 30	5.000							1															2				
394	NONE	MILWAUKEE REGIONAL												MOUNT ON S-40-130	20 X 11.5	230.00										2				
		MEDICAL CENTER												I BEAMS INCIDENTAL																
		MEDICAL COLLEGE																												
		OF WISCONSIN																												
		EXIT 305B																												

Addendum No. 2
ID 1060-33-80
Revised Sheet 1785
August 12, 2014

SHEET: 12 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1785	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I &II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W [IN.] x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W [FT.] x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
395	W3-3(2M)		36 X 36		9.000				1																		2				
396	R1-1 (2S)		30 X 30	5.180							1																2				
397	R7-1D(2S)		18 X 24								1																2				
398	R6-2R (2S)		24 X 30	5.000							1																2				
399	R7-1D(2S)		18 X 24	3.000							1																2				
400	W12-1D(2M)		24 X 24		4.000									4 FOOT MOUNTING HEIGHT ON LIGHT POLE													4				
401	W5-58(2S)		36 X 36		9.000									MOUNT ON END OF CRASH CUSHION													4				
402	R1-2(2S)		36 X 31	3.880							1																2				
403	W4-3L(2M)		36 X 36		9.000									ON LIGHT POLE													2				
404	R7-1D(2S)		18 X 24	3.000							1																2				
405	R1-1 (2S)		30 X 30	5.180							1																2				
406	R6-2R (2S)		24 X 30	5.000							1																2				
407	E5-1A(MOD)	EXIT 306	30 X 72	15.000					2					MOUNT TO BARRIER WALL													2				
408	R1-1(2S)	NARROWER SIGN	30 X 30	5.180							1			SEE DETAIL													2				
409	R2-1(2S)	SPEED LIMIT 30	24 X 30	5.000							1																2				
410	R6-2R(2S)		24 X 30	5.000										MOUNT ON WALL, INCIDENTAL - SEE DETAIL													2				
411	R6-2L(2S)		24 X 30	5.000							1																2				
412	W5-58(2M)		36 X 36		9.000									MOUNT ON END OF CRASH CUSHION													4				
413	R5-60		138 X 60	57.500						3																	4				
414	W9-63 (5) MODIFIED	LANE ENDS 1/2 MILE												MOUNT ON S-40-132 I BEAMS INCIDENTAL	6 X 7.5		45.00										4				
415	R2-1(5)	SPEED LIMIT 55	48 X 60	20.000										USE TYPE I IN LIEU OF TYPE II SIGN ON LIGHT POLE													5				
416	E6-1 MOD	68TH STREET 70TH STREET 1/4 MILE EXIT ONLY												MOUNT ON S-40-132 I BEAMS INCIDENTAL	16 X 11	176.00											4				
416A	E1-5P	EXIT 307A												MOUNT ON SIGN 416	12 X 2.5	30.00											4				
417	J4-1(5)		54 X 36	13.500										MOUNT ON LIGHT POLE													3				
	MB3-4		36 X 18																												
	M1-1	IH 94	36 X 36																												
418	NOT USED																														
419	J4-1(5)		54 X 36	13.500										ON LIGHT POLE													3				
	MB3-2		36 X 18																												
	M1-1	IH 94	36 X 36																												
420	R2-1(5)		48 X 60	20.000										ON LIGHT POLE													5				
421	W9-63 (5)	LANE ENDS												MOUNT ON S-40-136	6 X 7.5		45.00										4				
	MODIFIED - TYPE I	1/3 MILE												I BEAMS INCIDENTAL. TYPE I SIGN IN LIEU OF TYPE II SIGN																	
422	E6-5:1 MOD	68TH STREET 70TH STREET EXIT ONLY												MOUNT ON S-40-136 I BEAMS INCIDENTAL	16 X 9.5	152.00											4				
422A	E1-5P	EXIT 307A												MOUNT ON SIGH 422	12 X 2.5	30.00											4				
423	E6-1 MOD	181 84TH STREET 1/2 MILE ARROW DOWN EXIT ONLY												MOUNT ON S-40-135 I BEAMS INCIDENTAL	16 X 12.5	200.00											3				
423A	E1-5P	EXIT 306												MOUNT ON SIGN 423	11 X 2.5	27.50											3				
424	E6-1 MOD	41 894 45 CHICAGO FOND DU LAC 1 MILE DOWN ARROWS												MOUNT ON S-40-135 I BEAMS INCIDENTAL	18 X 15	270.00		1									3				
424A	E1-5P	EXITS 305 A-B												MOUNT ON SIGN 424	16 X 2.5	40.00											3				
425	E6-1 MOD	94 WEST MADISON DOWN ARROWS												MOUNT ON S-40-135 I BEAMS INCIDENTAL	18 X 10	180.00											3				

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FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCAL

TYPE I &II PERMANENT SIGNING -

Category Code 1000

2

1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO.1 LENGTH [FT]	POST NO.2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
426	NOT USED																													
427	NOT USED																													
428	NOT USED																										4				
429	NOT USED																										4				
430	R6-2R (2S)		24 X 30	5.000							1																4				
431	R7-1D(2S)		18 X 24	3.000							1																4				
432	W3-3(2M)		36 X 36		9.000				1					ON LIGHT POLE													4				
433	E5-1A(MODIFIED)	EXIT 307A	36 X 72	18.000						2				MODIFIED NARROW SIGN. MOUNT TO BACK OF WALL													4				
434	R7-1D(2S)		18 X 24	3.000										MOUNT ON LIGHT POLE													4				
435	R7-1D(2S)		18 X 24	3.000							1																4				
436	E1-1A	HAWLEY ROAD												MOVE TYPE I SIGN. NEW STEEL POSTS					1	2	B	1.6	98	1000			4				
		1/2 MILE																													
436A	E1-5P	EXIT 307B												MOUNT ON SIGN 436	16 X 2.5	40.00										4				
437	M1-9-4	70TH STREET	96 X 21	14.000										MOUNT ON BRIDGE. SEE DETAIL												5				
438	M1-9-4	70TH STREET	96 X 21	14.000										MOUNT ON BRIDGE. SEE DETAIL												5				
439	R5-5-7(3)		36 X 36	9.000					1																	2				
440	R7-1D(2S)		18 X 24	3.000							1															2				
441	NOT USED																													
442	R3-1(2S)		24 X 24	4.000									443													2				
443	R6-2R(2S)		24 X 30	5.000							1															2				
444	NONE	O CONNER STREET												MOUNT ON S-40-149	8.5 X 7	59.50										2				
		ONLY												I BEAMS INCIDENTAL																
		ARROW DOWN																												
445	R3-6T													TYPE I IN LIEU OF TYPE II SIGN	3.5 X 4	14.00										2				
	USE TYPE I													I BEAMS INCIDENTAL. S-40-149																
446	NONE	WEST												MOUNT ON S-40-149	5 X 7	35.00										2				
		94												I BEAMS INCIDENTAL																
		ONLY																												
		ARROW DOWN																												
447	NONE	STATE FAIR (ARROW RIGHT)					1	1	1																	2				
448	W4-3R(5)		48 X 48		16.000				1																	2				
449	NOT USED																													
450	W4-3L (2M)		36 X 36		9.000									ON LIGHT POLE												2				
451	NONE	HOSPITAL EXIT 306												MOUNT ON SIGN BRIDGE S-40-137	12 X 4.5	54.00										2				
														I BEAMS INCIDENTAL																
452	W4-3(2M)		36 X 36		9.000									MOUNT ON LIGHT POLE												4				
453	R5-1A(3)		42 X 30	8.750									433													4				
454	R5-1A(3)		42 X 30	8.750									432													4				
455	R6-2R(2S)		24 X 30	5.000							1															2				
456	R7-1D(2S)		18 X 24	3.000									474													2				
457	R7-1D(2S)		18 X 24	3.000							1															2				
458	W3-8(3)		48 X 48		16.000									MOUNT ON SIGNAL POLE												2				
459	J3-1(2S)		57 X 24	9.500										ON UPRIGHT OF OVERHEAD SIGN SUPPORT												2				
	M83-4		24 X 12											SEE MOUNTING DETAIL																
	M1-1	IH 94	24 X 24																											
	M86-2		21 X 21																											
460	D4-2A(2S)		30 X 36	7.500							1															2				
461	R7-1D(2S)		18 X 24	3.000							1															2				
462	R2-1(2S)	SPEED LIMIT 30	24 X 30	5.000							1															2				
463	W4-2L(2S)		36 X 36		9.000					1																2				
464	R1-1(2S)		30 X 30	5.180							1															2				
465	S1-1(2S)		36 X 36		6.750					1																2				
466	S16-9P(2S)		30 X 18		3.750								465													2				
467	R10-6(2S)		24 X 30	5.000										MOUNT ON SIGNAL POLE												2				
468	R10-10(2S)		24 X 30	5.000										MOUNT ON SIGNAL POLE												2				
469	R7-1D(2S)		18 X 24	3.000							1															2				
470	S4-51(2S)	SPEED LIMIT 15	24 X 48		8.000						1															2				
471	R10-10-(2S)		24 X 30	5.000										MOUNT ON SIGNAL POLE												2				
472	R5-5-7(3)		36 X 36	9.000										MOUNT ON LIGHT POLE												2				
473	R10-6 MODIFIED	ARROW DOWN RIGHT	24 X 30	5.000										MOUNT ON SIGNAL POLE												2				
474	R6-2R(2S)		24 X 30	5.000										MOUNT ON LIGHT POLE												2				
475	R1-1(2S)		30 X 30	5.180							1															2				
476	R2-1(2S)	SPEED LIMIT 30	24 X 30	5.000							1															2				
477	W12-1D(2M)		24 X 24		4.000								465													2				
														MOUNT UNDER THE S1-1 SIGN																

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TYPE I&II PERMANENT SIGNING -

Category Code 1000

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1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
478	NOT USED																													
478A	NOT USED	EXITS 305 A-B												MOUNT ON SIGN 478	16 X 2.5	40.00															
479	R6-1R(2S)		24 X 30	5.000										MOUNT ON LIGHT POLE													2				
480	R7-1D (2S)		18 X 24	3.000							1																2				
481	NONE	DOWNTOWN WEST ALLIS ARROW LEFT	60 X 39	16.250					2																		2				
482	R5-1A(2M)		36 X 24	6.000										ON LIGHT POLE													2				
483	R5-1A(2M)		36 X 24	6.000							1																2				
484	D12-2B(5)		114 X 48	38.000						2																	2				
485	D12-2B(5)		114 X 48	38.000						2																	4				
486	NONE	PARK AND RIDE (EXIT 307A)													9 X 7	63.00						B	1.6	98	1000		2				
487	E8-1 MOD	WEST ALLIS EXITS HAWLEY ROAD 1/4 70TH STREET DOWNTOWN- 1 84TH STREET 1 1/2													23 X 10.5	241.50						B	1.6	98	1000		2				
488	E8-1	HAWLEY ROAD 1/4 68TH - 70TH ST- 3/4 84TH STREET 1 1/4												MOUNT ON S-40-313 EXISTING SIGN BRIDGE PROVIDE NEW I BEAMS INCIDENTAL TO SIGN	20 X 7.5	150.00											2				
489	R9-3A(2S)		24 X 24	4.000							1			SHEET 29A													2				
490	R9-3BR(2S)		18 X 12	1.500										SHEET 29A													2				
491	R1-1(2S)		30 X 30	5.180							1			SHEET 13A													2				
492	W5-52R(5)		18 X 54		6.750									MOUNT ON LIGHT POLE. SHEET 28													3				
493	J4-1(5)		54 X 36	13.500										MOUNT ON LIGHT POLE. SHEET 28													3				
	MB3-2		36 X 18																												
	M1-1	IH 94	36 X 36																												
494	J3-1(2S)		60 X 24	10.000					1					SHEET 29													2				
	MB3-2		24 X 12																												
	M1-1	IH 94	24 X 24																												
	M4-20L		24 X 24																												
495	R7-1D (2S)		18 X 24	3.000										ON LIGHT POLE SHEET 30													4				
496	W4-2R(2M)		36 X 36		9.000									MOUNT ON LIGHT POLE . SHEET 30													4				
497	R5-1(2S)		30 X 30	6.250							1			SHEET 30													2				
498	NOT USED																										4				
499	NOT USED																										4				
500	R7-1D(2S)		18 X 24	3.000							1																2				
501	NONE	SOUTH 41-45 ONLY [ARROW DOWN]												I-BEAMS INCIDENTAL MOUNT ON S-40-992	5 X 9.5	47.50		1									2				
502	E8-1	HAWLEY RD 1/4 MITCHELL BLVD [LEFT] 3/4 [175] MILLER PKWY LEFT 3/4												MOUNT EB ON S-40-443 I-BEAMS INCIDENTAL	24 X 7.5	180.00											2				
503	W1-8(5)		36 X 48		12.000									MOUNT ON L.P. '5' HEIGHT. SHEET 10 OF 36													4				
504	W1-8(5)		36 X 48		12.000									4' VERTICAL CLEARANCE. SHEET 12 OF 36													3				
505	R7-1D(2S)		18 X 24	3.000										MOUNT ON LIGHT POLE													4				
506	R7-1D(2S)		18 X 24	3.000							1																2				
507	R10-6(MOD)		24 X 36	6.000					1					MOUNT ON SIGNAL POLE													2				
508	R10-6(2S)		24 X 36	6.000										MOUNT ON POST													2				
509	R10-10L(2S)		24 X 30	5.000										MOUNT ON SIGNAL POLE													2				
510	NONE	94 WEST MADISON EXIT ONLY												MOUNT ON S-40-22 I-BEAMS INCIDENTAL	18 X 11.5	207.00											2				

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PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1788	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I&II PERMANENT SIGNING -

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1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W x H [IN.] x [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W x H [FT.] x [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR: POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
510A	LEFT EXIT 1B													MOUNT ON S-40-22	9 X 4	36.00											2				
511	NONE	94 EAST MILWAUKEE EXIT ONLY												MOUNT ON S-40-22 I BEAMS INCIDENTAL	16 X 10.5	168.00											2				
511A	EXIT 1A													MOUNT ON S-40-22	9 X 2.5	22.50											2				
512		SHERIFF SUBSTATION NEXT RIGHT					2	1		2																	1				
513		CRASH INVESTIGATION SITE	120 X 48	40.000										MOUNT UNDER SIGN #512													1				
514	R11-54F(2S)		48 X 30			10.000			2					SHEET 29C													4				
515	R11-54F(2S)		48 X 30			10.000			2					SHEET 29D													2				
516	R11-54F(2S)		48 X 30			10.000			2					SHEET 29D													2				
517	R11-54F(2S)		48 X 30			10.000			2					SHEET 13A													2				
518	R11-54F(2S)		48 X 30			10.000			2					SHEET 13A													2				
519	R11-54F(2S)		48 X 30			10.000			2					SHEET 13B													2				
520	R11-54F(2S)		48 X 30			10.000			2					SHEET 13B													2				
521		LINCOLN AVE 3/4 MILE					3			3				MOVE ONTO NEW WOOD POSTS FOR MAINTENANCE PURPOSES SEE A5-7 STATE PLATE, INCIDENTAL MOUNTINGS SHEET 8		1.00													5				
522	NOT USED																														
523	W4-3						1	1	1					SHEET 23													2				
524	W13-2(MOD)						2	1	2					SHEET 23													3				
525	E8-1									4				SHEET 20 SEE A5-7 STATE PLATE FOR INSTALLATION SIGN WILL BE REMOVED UNDER CORE 2												2				
526	W1-3R(5)		48 X 48		16.000					1				SHEET 10													1				
526A	W13-1	45 MPH	36 X 36		9.000									UNDER SIGN #526													1				
527	W13-2C		48 X 90		30.000									SHEET 10													1				
528	W14-2		30 X 30		6.250						1			SHEET 27A													3				
529	R47-1D(2S)		18 X 24	3.000										SHEET 27B - ON WALL, SEE DETAIL, INCIDENTAL													3				
530	R47-1D(2S)		18 X 24	3.000							1			SHEET 27B													3				
531	W11-2(2S)		30 X 30		6.250						1			SHEET 29C													4				
531A	W16-7L(2S)		24 X 12		2.000								531	SHEET 29C													4				
532	W11-2(2S)		30 X 30		6.250						1			SHEET 29C													4				
532A	W16-7L(2S)		24 X 12		2.000								532	SHEET 29C													4				
533	R7-1D(2S)		18 X 24	3.000							1			SHEET 29D													2				
534	R7-1D(2S)		18 X 24	3.000							1			SHEET 29D													2				
535														MOUNT ON S-40-97.1 I-BEAMS INCIDENTAL SHEET 29D	5 X 7	35.00											2				
536	W4-2R(2S)		30 X 30		6.250						1			SHEET 30													2				
537	W9-1R(2S)		30 X 30		6.250						1			SHEET 30													2				
538	R6-2R(2S)		24 X 30	5.000							1			SHEET 30													4				
539	R6-2R(2S)		24 X 30	5.000							1			SHEET 30													2				
540	R7-1D(2S)		18 X 24	3.000							1			SHEET 32A													2				
541	R5-1A(5)		42 X 30	8.750										SHEET 29A - ON POLE UPRIGHT													4				
542	R5-1A(5)		42 X 30	8.750										SHEET 29A - ON POLE UPRIGHT													4				
543	J3-2	STH 181					1	1	1					SHEET 29B													4				
544		NO ENGINE BRAKING					1	1			1			SHEET 29C													4				
545	R3-18							1						SHEET 29C													4				
546	R10-3E							1						SHEET 29C													4				
547	R10-3E							1						SHEET 29C													4				
548	R3-18							1						SHEET 29C													4				
549	W11-8							1						SHEET 29D													2				
550	D9-54(2S)	519 N. 97TH ST	18 X 24	3.000										ON WALL, SEE DETAIL, SHEET 13													2				
551	NONE	BLANK	36 X 6	1.500										ON WALL, SEE DETAIL, SHEET 13													2				
552	D9-54(2S)	S. 92ND ST & ADLER ST	18 X 24	3.000										MOUNT UP HIGH ON RETAINING WALL.													5				
553	D9-54(2S)	S. 92ND ST & ADLER ST	18 X 24	3.000										MOUNT UP HIGH ON RETAINING WALL BACK SIDE.													5				
554	D9-54(2S)	S. 92ND ST & ADLER ST	18 X 24	3.000										ON RETAINING WALL UP HIGH.													5				

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ID 1060-33-80
Revised Sheet 1789
August 12, 2014

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1789	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE

TYPE I&II PERMANENT SIGNING -

Category Code 1000

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1060-33-80 zoo interchange phase 1

SIGN NO.	SIGN CODE & SIZE	SIGN MESSAGE	SIGN SIZE W [IN.] x H [IN.]	637.2210 SIGNS TYPE II REFLECTIVE H [SF]	637.2230 SIGNS TYPE II RELFECTIVE F [SF]	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING [SF]	638.3000 REM SMALL SIGN SUP [EA]	638.2102 MOVING SIGNS TYPE II [EA]	634.0618 WOOD POSTS 4"X 6"x18' [EA]	634.0622 WOOD POSTS 4" X 6" X 22' [EA]	634.0816 POSTS TUBULAR STEEL 2" X 2" X 16' [EA]	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II [EA]	MOUNT ON SAME POST AS SIGN #	REMARKS / NEW SIGN LOCATION	TYPE I SIGN SIZE W [FT.] x H [FT.]	637.1220 SIGNS TYPE I REFLECTIVE SH [SF]	637.1230 SIGNS TYPE I REFLECTIVE F [SF]	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I [EA]	638.2101 MOVING SIGNS TYPE I [EA]	638.3100 REM STR STEEL SIGN SUP [EA]	STEEL POST TYPE	636.0100 SIGN NO. SUPPORTS CONCRETE MASONRY [CY]	636.0500 SIGN SUPPORTS STEEL REINF. [LBS]	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS [EST.LBS]	635.0300 SIGN SUPPORTS REPLACING BASE CONN. BOLTS [EA]	SPV.0060.0153 SIGN SUPPORT SPECIAL MOUNTING [EA]	PHASE SIGN TO BE INSTALLED	INFO ONLY-POST LENGTHS TO BE VERIFIED BY CONTRACTOR POST NO 1 LENGTH [FT]	POST NO 2 LENGTH [FT]	OFF SET DISTANCE [FT]	DIST BTWN POSTS "S" [FT]
555	D9-54(2S)	S. 92ND ST & ADLER ST	18 X 24	3.000										ON RETAINING WALL UP HIGH - BACK SIDE.														5				
556	D9-54(2S)	S. 94TH ST @ W. ADLER ST	18 X 24	3.000										MOUNT ON NOISE WALL NEXT TO OPENING IN WALL FWY SIDE.														5				
557	D9-54(2S)	S. 94TH ST @ W. ADLER ST	18 X 24	3.000										BACK SIDE - OVER OPENING PER DETAIL.														5				
558	D9-54(2S)	S. 94TH ST @ W. ADLER ST	18 X 24	3.000										ON RETAINING WALL 15 FEET ABOVE ROADWAY FWY SIDE.														5				
559	D9-54(2S)	S. 89TH ST @ W. ADLER ST	18 X 24	3.000										MOUNT ON NOISE WALL FWY SIDE.														5				
560	D9-54(2S)	87TH PL & W. ADLER ST	18 X 24	3.000										MOUNT ON NOISE WALL FWY SIDE.														5				
561	D9-54(2S)	87TH PL & W. ADLER ST	18 X 24	3.000										MOUNT ON NOISE WALL BACK SIDE.														5				
562	D9-54(2S)	S. 84TH ST & W. ADLER ST	18 X 24	3.000						1				GROUND MOUNT AT FWY NEAR OVERPASS.														5				
563	D9-54(2S)	9300 W. CHESTER ST	18 X 24	3.000										ON NOISE WALL RIGHT OF OPENING FWY SIDE.														5				
564	D9-54(2S)	9300 W. CHESTER ST	18 X 24	3.000										ON NOISE WALL BACK SIDE OVER OPENING.														5				
565	D9-54(2S)	S. 92ND ST & W. CHESTER ST	18 X 24	3.000										ON RETAINING WALL 12 FEET ABOVE ROADWAY FWY SIDE.														5				
566	D9-54(2S)	S. 92ND ST & W. CHESTER ST	18 X 24	3.000										ON RETAINING WALL 12 FEET ABOVE ROADWAY FWY SIDE.														5				
567	D9-54(2S)	9100 W. CHESTER ST	18 X 24	3.000										ON NOISE WALL NEXT TO OPENING FWY SIDE.														5				
568	D9-54(2S)	9100 W. CHESTER ST	18 X 24	3.000										ON BACK SIDE NOISE WALL OVER OPENING.														5				
569	D9-54(2S)	9000 W. CHESTER ST	18 X 24	3.000							1			ON STEEL POST NEXT TO FENCE FWY SIDE.														5				
570	D9-54(2S)	S. 84TH ST & W. O'CONNER ST	18 X 24	3.000										END OF NOISE WALL FWY SIDE.														5				
571	D9-54(2S)	S. 84TH ST & W. O'CONNER ST	18 X 24	3.000										END OF NOISE WALL BACK SIDE.														5				
572	D9-54(2S)	S. 80TH ST & W. O'CONNER ST	18 X 24	3.000										ON WALL FWY SIDE.														5				
573	D9-54(2S)	S. 80TH ST & W. O'CONNER ST	18 X 24	3.000										ON WALL BACK SIDE.														5				
574	D9-54(2S)	S. 73RD ST & W. O'CONNER ST	18 X 24	3.000										ON NOISE WALL FWY SIDE.														5				
575	D9-54(2S)	S. 73RD ST & W. O'CONNER ST	18 X 24	3.000										ON NOISE WALL BACK SIDE.														5				
576	D9-54(2S)	S. 70TH ST & W. O'CONNER ST	18 X 24	3.000							1			ON STEEL POST.														5				
577	D9-54(2S)	S. 73RD ST & W. ADLER ST	18 X 24	3.000										ON NOISE WALL FWY SIDE.														5				
578	D9-54(2S)	S. 73RD ST & W. ADLER ST	18 X 24	3.000										ON NOISE WALL BACK SIDE.														5				
579	D9-54(2S)	332 S. 70TH ST	18 X 24	3.000							1			ON STEEL POST.														5				
580	W14-1(2S)		30 X 30	6.250							1			ON SHEET 28 OF 36														3				
581	R2-1		24 X 30	5.000							1			ON SHEET 29A OF 36														4				
581	R5-1A(5)		42 X 30	8.750					1					ON SHEET 13 OF 36														5				
582	R5-1A(5)		42 X 30	8.750					1					ON SHEET 13 OF 36														5				
UNDISTRIBUTED				--			5	3	5			2	--	--	x	0.00		1	1	2	--	5.0	200	1000	2	2		--	--	--	--
TOTALS				2850.130	1060.000	144.600	26	20	142	49	155	9	--	--		12879.000	202.500	19	3	4	--	21.7	1206	11200	2	2					

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1790
August 12, 2014

SHEET: 17 OF 17

PROJECT NO:1060-33-80	HWY: IH 94, IH 894, USH 45	COUNTY:MILWAUKEE	MISCELLANEOUS QUANTITIES – PERMANENT SIGNING	SHEET: 1790	E

FILE NAME : N:\SPO\Operations\Traffic_Ops\Signing\Miscellaneous Quantities\1060-33-80\030502_mq.pptx PLOT DATE : 16-APR-2014 PLOT BY : msccrb PLOT NAME : 030502_mq.pdf PLOT SCALE : 1:1

CITY OF MILWAUKEE-WATER

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	612.0902.S* INSULATION BOARD POLYSTYRENE 4-INCH SY	SPV.0060.5000 REMOVING HYDRANT EACH	SPV.0060.5001 INSTALL HYDRANT EACH	SPV.0060.5002 CONNECT ORIGINAL SERVICE (C.O.S.) EACH	SPV.0060.5003 REPLACE ORIGINAL SERVICE (R.O.S.) EACH	SPV.0060.5005 ROADWAY SERVICE BOX (R.S.B.) EACH	SPV.0060.5014 BENTONITE TRENCH DAM EACH	SPV.0090.5000 STEEL CASING W/ DUCTILE IRON 12-INCH CARRIER LF	SPV.0090.5001 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER LF	SPV.0090.5002 STEEL CASING W/ DUCTILE IRON 24-INCH CARRIER LF
7060		W. CHESTER ST.															
			44CH+67.9	9.1'LT		49CH+85.0	21.7'LT	--	--	--	--	--	--	--	--	--	--
			45CH+20.7	19.6'LT		--	--	--	--	--	--	1	--	--	--	--	--
			45CH+64.0	19.6'LT		--	--	--	--	--	--	1	--	--	--	--	--
			46CH+14.6	19.6'LT		--	--	--	--	--	--	1	--	--	--	--	--
			46CH+52.0	7.9'LT		--	--	--	1	--	--	--	--	--	--	--	--
			46CH+55.6	17.3'LT		--	--	--	--	1	--	--	--	--	--	--	--
			46CH+63.8	21.2'LT		--	--	--	--	--	--	1	--	--	--	--	--
			47CH+18.1	23.4'LT		--	--	--	--	--	--	1	--	--	--	--	--
			47CH+66.5	24.7'LT		--	--	--	--	--	--	1	--	--	--	--	--
			49CH+48.7	22.0'LT		--	--	--	--	1	--	--	--	--	--	--	--
			49CH+53.7	22.0'LT		--	--	--	--	--	--	--	--	--	--	--	--
			49CH+53.2	30.5'LT		--	--	--	1	--	--	--	--	--	--	--	--
			49CH+57.2	22.0'LT		49CH+60.2	37.9'LT	--	--	--	--	--	--	--	--	--	--
			10CHWM+00.0	--		15CHWM+50.0	--	--	--	--	--	--	--	--	--	--	--
			10CHWM+24.7	9.6'LT		10CHWM+26.6	--	--	--	--	--	--	--	--	--	--	--
			10CHWM+68.4	--		--	--	--	--	--	--	--	--	--	--	--	--
			14CHWM+01.7	--		14CHWM+07.0	--	--	--	--	--	--	--	--	--	--	--
			14CHWM+23.6	57.8'RT		--	--	--	1	--	--	--	--	--	--	--	--
			14CHWM+24.5	20.4'LT		--	--	--	--	1	--	--	--	--	--	--	--
			15CHWM+50.0	--		16CHWM+46.9	--	--	--	--	--	--	--	--	--	--	--
			16CHWM+46.9	--		20CHWM+21.1	--	--	--	--	--	--	--	--	--	--	--
			16CHWM+74.4	--		--	--	--	--	--	--	1	--	--	--	--	--
			17CHWM+94.8	23.5'RT		--	--	--	1	--	--	--	--	--	--	--	--
			18CHWM+13.5	--		18CHWM+14.4	12.7'LT	--	--	--	--	--	--	--	--	--	--
			18CHWM+53.5	--		--	--	--	--	--	--	1	--	--	--	--	--
		SUBTOTALS						--	4	3	--	8	--	--	--	--	--
7060		W. 92ND ST.															
			50TJWM+00.0	--		50TJWM+29.5	--	--	--	--	--	--	--	--	--	--	--
			50TJWM+29.5	--		53TJWM+46.3	--	--	--	--	--	--	--	--	--	317	--
			53TJWM+46.3	--		54TJWM+05.1	--	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						--	--	--	--	--	--	--	--	317	--
7060		W. ADLER ST.															
			983AD+60.0	11.7'RT		989AD+00.0	4.0'RT	--	--	--	--	--	--	--	--	--	--
			983AD+70.9	9.6'RT		--	--	--	--	1	--	--	--	--	--	--	--
			983AD+80.6	27.0'RT		--	--	--	1	--	--	--	--	--	--	--	--
			984AD+24.1	4.3'RT		--	--	--	--	--	1	--	--	--	--	--	--
			985AD+49.1	2.1'RT		--	--	--	--	--	1	--	--	--	--	--	--
			986AD+02.3	2.5'RT		--	--	--	--	--	1	--	--	--	--	--	--
			987AD+75.5	2.7'RT		987AD+78.2	10.9'RT	--	--	--	--	--	--	--	--	--	--
			988AD+38.0	3.6'RT		--	--	--	--	--	1	--	--	--	--	--	--
			988AD+75.9	3.4'RT		--	--	--	--	--	1	--	--	--	--	--	--

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1856
August 12, 2014

(CONTINUED ON NEXT SHEET)

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	612.0902.S* INSULATION BOARD POLYSTYRENE 4-INCH SY	SPV.0060.5000 REMOVING HYDRANT EACH	SPV.0060.5001 INSTALL HYDRANT EACH	SPV.0060.5002 CONNECT ORIGINAL SERVICE (C.O.S.) EACH	SPV.0060.5003 REPLACE ORIGINAL SERVICE (R.O.S.) EACH	SPV.0060.5005 ROADWAY SERVICE BOX (R.S.B.) EACH	SPV.0060.5014 BENTONITE TRENCH DAM EACH	SPV.0090.5000 STEEL CASING W/ DUCTILE IRON 12-INCH CARRIER LF	SPV.0090.5001 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER LF	SPV.0090.5002 STEEL CASING W/ DUCTILE IRON 24-INCH CARRIER LF
7060			989AD+00.0	4.0'RT		993AD+50.0	.5'LT	--	--	--	--	--	--	--	--	--	--
			989AD+12.3	2.8'RT		--	--	--	--	--	1	--	--	--	--	--	--
			989AD+52.1	2.2'RT		--	--	--	--	--	1	--	--	--	--	--	--
			989AD+77.5	1.8'RT		--	--	--	--	--	1	--	--	--	--	--	--
			990AD+23.5	1.6'RT		990AD+40.0	32.7'RT	--	--	--	--	--	--	--	--	--	--
			990AD+52.6	1.6'RT		--	--	--	--	1	--	--	--	--	--	--	--
			990AD+57.6	17.6'LT		--	--	--	1	--	--	--	--	--	--	--	--
			990AD+74.9	1.5'RT		--	--	--	--	--	1	--	--	--	--	--	--
			991AD+06.5	1.5'RT		--	--	--	--	--	1	--	--	--	--	--	--
			991AD+38.9	1.4'RT		--	--	--	--	--	1	--	--	--	--	--	--
			992AD+04.9	1.2'RT		--	--	--	--	--	1	--	--	--	--	--	--
			992AD+37.2	1.2'RT		--	--	--	--	--	1	--	--	--	--	--	--
			992AD+86.7	1.1'RT		992AD+98.7	23.0'RT	--	--	--	--	--	--	--	--	--	--
			993AD+50.0	.5'LT		997AD+00.0	11.2'RT	--	--	--	--	--	--	--	--	--	--
			993AD+66.2	--		--	--	--	--	--	1	--	--	--	--	--	--
			993AD+98.7	.4'LT		--	--	--	--	--	1	--	--	--	--	--	--
			994AD+31.9	.7'LT		--	--	--	--	--	1	--	--	--	--	--	--
			994AD+62.6	1.0'LT		--	--	--	--	--	1	--	--	--	--	--	--
			996AD+09.6	24.3'LT		--	--	--	1	--	--	--	--	--	--	--	--
			996AD+38.0	11.3'RT		--	--	--	--	--	1	--	--	--	--	--	--
			996AD+49.3	11.2'RT		--	--	--	--	1	--	--	--	--	--	--	--
			996AD+97.0	11.0'RT		--	--	--	--	--	1	--	--	--	--	--	--
			997AD+00.0	11.2'RT		999AD+50.0	10.3'RT	--	--	--	--	--	--	--	--	--	--
			998AD+57.7	10.4'RT		998AD+55.4	26.6'RT	--	--	--	--	--	--	--	--	--	--
			998AD+76.3	23.4'LT		--	--	--	1	--	--	--	--	--	--	--	--
			998AD+77.3	10.3'RT		--	--	--	--	1	--	--	--	--	--	--	--
			999AD+50.0	10.3'RT		1002AD+35.0	11.8'LT	--	--	--	--	--	--	--	--	--	--
			999AD+61.11	10.3'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1000AD+27.4	10.2'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1001AD+16.2	10.2'RT		1001AD+14.5	26.9'RT	--	--	--	--	--	--	--	--	--	--
			1001AD+36.5	22.8'RT		--	--	--	--	1	--	--	--	--	--	--	--
			1001AD+44.9	23.3'LT		--	--	--	1	--	--	--	--	--	--	--	--
			1003AD+70.8	11.6'LT		1003AD+76.8	11.9'LT	--	--	--	--	--	--	--	--	--	--
			1003AD+73.6	22.9'LT		--	--	--	1	--	--	--	--	--	--	--	--
			1003AD+73.8	11.6'LT		1003AD+73.8	8.6'LT	--	--	--	--	--	--	--	--	--	--
			1003AD+95.4	13.2'LT		1004AD+05.4	13.1'LT	--	--	--	--	--	--	--	--	--	--
			1003AD+98.4	13.2'LT		--	--	--	1	1	--	--	--	--	--	--	--
			1006AD+53.1	12.5'LT		1006AD+60.1	12.5'LT	--	--	--	--	--	--	--	--	--	--
			1006AD+56.6	12.5'LT		--	--	--	1	1	--	--	--	--	--	--	--
			1008AD+94.7	19.0'RT		1008AD+94.7	26.0'RT	--	--	--	--	--	--	--	--	--	--
			1009AD+14.7	22.4'RT		--	--	--	--	1	--	--	--	--	--	--	--
			1009AD+19.4	23.2'LT		--	--	--	1	--	--	--	--	--	--	--	--
			1010AD+82.8	11.8'LT		1010AD+92.6	11.7'LT	--	--	--	--	--	--	--	--	--	--
			1010AD+87.7	11.7'LT		1015AD+00.0	6.6'RT	--	--	--	--	--	--	--	--	--	--

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1857
August 12, 2014

(CONTINUED ON NEXT SHEET)

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	612.0902.S* INSULATION BOARD POLYSTYRENE 4-INCH SY	SPV.0060.5000 REMOVING HYDRANT EACH	SPV.0060.5001 INSTALL HYDRANT EACH	SPV.0060.5002 CONNECT ORIGINAL SERVICE (C.O.S.) EACH	SPV.0060.5003 REPLACE ORIGINAL SERVICE (R.O.S.) EACH	SPV.0060.5005 ROADWAY SERVICE BOX (R.S.B.) EACH	SPV.0060.5014 BENTONITE TRENCH DAM EACH	SPV.0090.5000 STEEL CASING W/ DUCTILE IRON 12-INCH CARRIER LF	SPV.0090.5001 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER LF	SPV.0090.5002 STEEL CASING W/ DUCTILE IRON 24-INCH CARRIER LF
7060			1011AD+78.6	10.1'RT		--	--	--	--	1	--	--	--	--	--	--	--
			1011AD+79.4	22.9'LT		--	--	--	1	--	--	--	--	--	--	--	--
			1012AD+24.3	10.0'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1012AD+58.8	9.9'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1013AD+24.0	9.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1013AD+60.9	9.6'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1014AD+37.7	24.6'LT		--	--	--	1	--	--	--	--	--	--	--	--
			1014AD+38.5	11.5'RT		--	--	--	--	1	--	--	--	--	--	--	--
			1015AD+00.0	6.6'RT		1019AD+59.0	12.9'LT	--	--	--	--	--	--	--	--	--	--
			1015AD+26.0	4.9'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1019AD+29.5	22.7'LT		1019AD+29.9	26.7'LT	--	--	--	--	--	--	--	--	--	--
			1019AD+49.0	21.6'LT		1019AD+49.2	25.6'LT	--	--	--	--	--	--	--	--	--	--
			1019AD+51.8	13.1'LT		1019AD+63.8	12.7'LT	--	--	--	--	--	--	--	--	--	--
			1023AD+34.6	17.4'LT		1023AD+42.9	18.6'LT	--	--	--	--	--	--	--	--	--	--
			1023AD+39.9	18.2'LT		--	--	--	--	1	2	--	--	--	--	--	--
			1023AD+77.3	21.4'LT		1023AD+84.8	21.5'LT	--	--	--	--	--	--	--	--	--	--
			1023AD+79.8	37.0'LT		--	--	--	1	--	--	--	--	--	--	--	--
			35F+61.6	49.6'RT		--	--	--	1	1	--	--	--	--	--	--	--
		SUBTOTALS						--	13	12	26	--	--	--	--	--	--
7060		S. 87TH PL.															
			1011AD+55.4	10.1'RT		1011AD+51.5	328.8'RT	--	--	--	--	--	--	--	--	--	--
			1011AD+55.1	31.5'RT		--	--	--	--	--	--	--	--	--	--	--	--
			1011AD+54.4	81.5'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+54.2	94.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+53.0	175.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+53.0	178.8'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+52.0	246.2'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+52.0	248.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+51.5	284.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+51.3	295.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+51.1	312.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1011AD+51.5	328.8'RT		--	--	--	--	1	--	--	--	--	--	--	--
			1011AD+49.6	335.4'RT		--	--	--	1	--	--	--	--	--	--	--	--
		SUBTOTALS						--	1	1	9	--	--	--	--	--	--
7060		S. 87TH ST.															
			1014AD+13.2	11.7'RT		1015AD+60.3	330.6'RT	--	--	--	--	--	--	--	--	--	--
			1014AD+12.4	91.8'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1014AD+10.9	160.4'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1014AD+10.3	181.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1014AD+09.2	243.4'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1014AD+09.1	248.8'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1015AD+50.0	308.8'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1015AD+53.0	315.3'RT		--	--	--	--	--	1	--	--	--	--	--	--
														2			

Addendum No. 2
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Revised Sheet 1858
August 12, 2014

(CONTINUED ON NEXT SHEET)

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	612.0902.S* INSULATION BOARD POLYSTYRENE 4-INCH SY	SPV.0060.5000 REMOVING HYDRANT EACH	SPV.0060.5001 INSTALL HYDRANT EACH	SPV.0060.5002 CONNECT ORIGINAL SERVICE (C.O.S.) EACH	SPV.0060.5003 REPLACE ORIGINAL SERVICE (R.O.S.) EACH	SPV.0060.5005 ROADWAY SERVICE BOX (R.S.B.) EACH	SPV.0060.5014 BENTONITE TRENCH DAM EACH	SPV.0090.5000 STEEL CASING W/ DUCTILE IRON 12-INCH CARRIER LF	SPV.0090.5001 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER LF	SPV.0090.5002 STEEL CASING W/ DUCTILE IRON 24-INCH CARRIER LF
7060			1015AD+60.0	330.0'RT		1015AD+69.0	325.7'RT	--	--	1	--	--	--	--	--	--	--
			1015AD+70.3	327.4'RT		--	--	--	1	--	--	--	--	--	--	--	--
		SUBTOTALS						--	1	1	7	--	--	--	--	--	--
7060		S. 86TH ST.															
			1016AD+96.0	4.4'LT		1019AD+57.7	233.5'RT	--	--	--	--	--	--	--	--	--	--
			1017AD+13.2	38.8'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1017AD+23.5	60.9'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1017AD+38.4	92.6'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1017AD+53.6	125.1'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1017AD+56.7	131.5'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1017AD+69.4	158.6'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1017AD+75.0	170.5'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1017AD+88.5	199.4'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1018AD+81.8	211.8'RT		--	--	--	1	--	--	--	--	--	--	--	--
			1018AD+85.1	222.1'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1019AD+43.5	226.7'RT		--	--	--	--	--	1	--	--	--	--	--	--
			1019AD+57.1	233.1'RT		--	--	--	--	1	--	--	--	--	--	--	--
			1019AD+71.0	243.2'RT		--	--	--	--	--	--	1	1	--	--	--	--
		SUBTOTALS						--	1	1	10	1	1	--	--	--	--
7060		ZOOLOGICAL SOCIETY															
			24BCWM+09.9	--		28BCWM+30.2	--	--	--	--	--	--	--	--	--	--	336
		SUBTOTALS						--	--	--	--	--	--	--	--	--	336
7060		I-94 CROSSING															
			10WM+05.5	--		10WM+19.0	--	--	--	--	--	--	--	--	--	--	--
			10WM+19.0	--		10WM+45.0	--	--	--	--	--	--	--	--	26	--	--
			12WM+43.4	--		13WM+33.6	--	--	--	--	--	--	--	--	17	--	--
			13WM+33.6	--		13WM+79.8	--	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						--	--	--	--	--	--	--	43	--	--
7060		O' CONNOR STREET															
			738FA+08.7	45.8'LT		--	--	--	1	--	--	--	--	--	--	--	--
			740FA+20.2	6.8'LT		741FA+94.2	5.2'LT	--	--	--	--	--	--	--	--	--	--
			740FA+98.2	4.5'LT		741FA+03.0	39.4'LT	--	--	--	--	--	--	--	--	--	--
			741FA+48.6	5.2'LT		--	--	--	1	--	--	--	--	--	--	--	--
			741FA+57.8	4.6'LT		--	--	--	--	1	--	--	--	--	--	--	--
			544CR+94.4	22.6'LT		--	--	--	1	1	--	--	--	--	--	--	--
			579CR+26.1	22.6'LT		--	--	--	1	1	--	--	--	--	--	--	--
		SUBTOTALS						--	4	3	--	--	--	--	--	--	--
7060		N. 95TH STREET															
			203BL+12.8	51.4'RT		--	--	--	1	1	--	--	--	--	--	--	--
		SUBTOTALS						--	1	1	--	--	--	--	--	--	--

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(CONTINUED ON NEXT SHEET)

Addendum No. 2
ID 1060-33-80
Revised Sheet 1859
August 12, 2014

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	612.0902.S* INSULATION BOARD POLYSTYRENE 4-INCH SY	SPV.0060.5000 REMOVING HYDRANT EACH	SPV.0060.5001 INSTALL HYDRANT EACH	SPV.0060.5002 CONNECT ORIGINAL SERVICE (C.O.S.) EACH	SPV.0060.5003 REPLACE ORIGINAL SERVICE (R.O.S.) EACH	SPV.0060.5005 ROADWAY SERVICE BOX (R.S.B.) EACH	SPV.0060.5014 BENTONITE TRENCH DAM EACH	SPV.0090.5000 STEEL CASING W/ DUCTILE IRON 12-INCH CARRIER LF	SPV.0090.5001 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER LF	SPV.0090.5002 STEEL CASING W/ DUCTILE IRON 24-INCH CARRIER LF
7060		W. DIXON STREET															
			10CRWM+50.0	--		10CRWM+94.5	--	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						--	--	--	--	--	--	--	--	--	--
7060		W. BLUEMOUND ROAD															
			10BLWM+55	--		12BLWM+15	--	--	--	--	--	--	--	--	--	--	--
			12BLWM+15	--		12BLWM+37	--	--	--	--	--	--	--	--	--	--	--
			10BLWM+74	--		--	--	--	--	1	--	--	--	--	--	--	--
			11BLWM+17	--		11BLWM+20	14.04' RT	--	--	--	--	--	--	--	--	--	--
			11BLWM+42	18.50' LT		--	--	--	1	--	--	--	--	--	--	--	--
			12BLWM+37	--		15BLWM+11	--	--	--	--	--	--	--	--	--	--	--
			15BLWM+11	--		15BLWM+41	--	--	--	--	--	--	--	--	--	--	--
			15BLWM+36	2' LT		15BLWM+36	2' RT	--	--	--	--	--	--	1	--	--	--
			15BLWM+41	--		17BLWM+49	--	--	--	--	--	--	--	--	--	--	--
			16BLWM+16	2' LT		16BLWM+16	2' RT	--	--	--	--	--	--	1	--	--	--
			17BLWM+20	3.72' RT		--	--	--	1	--	--	--	--	--	--	--	--
			17BLWM+28	--		--	--	--	--	1	--	--	--	--	--	--	--
		SUBTOTALS						--	2	2	--	--	--	2	--	--	--
7060		CATEGORY TOTAL						--	27	24	52	9	1	2	43	317	336
7065		I-94 CROSSING															
			12WM+43.4	--		13WM+33.6	--	--	--	--	--	--	--	--	73	--	--
			13WM+33.6	--		13WM+79.8	--	--	--	--	--	--	--	--	--	--	--
		SUBTOTAL						--	--	--	--	--	--	--	73	--	--
7065		ZOOLOGICAL SOCIETY															
			11BCWM+17.2	--		16BCWM+00.0	--	--	--	--	--	--	--	--	--	--	--
			11BCWM+30	--		--	--	--	--	1	--	--	--	--	--	--	--
			15BCWM+50	--		--	--	--	--	1	--	--	--	--	--	--	--
			15BCWM+82.1	207.6'RT		--	--	--	1	--	--	--	--	--	--	--	--
			16BCWM+00.0	--		22BCWM+00.0	--	--	--	--	--	--	--	--	--	--	--
			19BCWM+50	--		--	--	--	--	1	--	--	--	--	--	--	--
			22BCWM+00.0	--		24BCWM+00.0	--	--	--	--	--	--	--	--	--	--	--
			23BCWM+50	--		--	--	--	--	1	--	--	--	--	--	--	--
			24BCWM+00.0	--		24BCWM+04.9	--	--	--	--	--	--	--	--	--	--	--
			24BCWM+04.9	--		24BCWM+09.9	--	--	--	--	--	--	--	--	--	--	--
			24BCWM+09.9	--		28BCWM+30.2	--	5	--	--	--	--	--	--	--	--	85
			24BCWM+96.9	20.0'RT		--	--	--	1	--	--	--	--	--	--	--	--
			28BCWM+30.2	--		28BCWM+64.3	--	--	--	--	--	--	--	--	--	--	--
		SUBTOTAL						5	2	4	--	--	--	--	--	--	85

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1860
August 12, 2014

(CONTINUED ON NEXT SHEET)

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	612.0902.S* INSULATION BOARD POLYSTYRENE 4-INCH SY	SPV.0060.5000 REMOVING HYDRANT EACH	SPV.0060.5001 INSTALL HYDRANT EACH	SPV.0060.5002 CONNECT ORIGINAL SERVICE (C.O.S.) EACH	SPV.0060.5003 REPLACE ORIGINAL SERVICE (R.O.S.) EACH	SPV.0060.5005 ROADWAY SERVICE BOX (R.S.B.) EACH	SPV.0060.5014 BENTONITE TRENCH DAM EACH	SPV.0090.5000 STEEL CASING W/ DUCTILE IRON 12-INCH CARRIER LF	SPV.0090.5001 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER LF	SPV.0090.5002 STEEL CASING W/ DUCTILE IRON 24-INCH CARRIER LF
7065		W. CHESTER ST.															
			16CHWM+46.9	--		20CHWM+21.1	--	--	--	--	--	--	--	--	--	--	--
			19CHWM+98.4	--		--	--	--	--	1	--	--	--	--	--	--	--
		SUBTOTAL						--	--	1	--	--	--	--	--	--	--
7065		O' CONNOR STREET															
			740FA+20.2	6.8'LT		741FA+94.2	5.2'LT	--	--	--	--	--	--	--	--	--	--
		SUBTOTAL						--	--	--	--	--	--	--	--	--	--
7065		CATEGORY TOTAL						5	2	5	--	--	--	--	73	--	85
		PROJECT TOTAL						5	29	29	52	9	1	2	116	317	421

2 2

*ADDITIONAL QUANTITIES SHOWN ELSEWHERE

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ID 1060-33-80
Added Sheet 1860A
August 12, 2014

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	SPV.0090.5003 DUCTILE IRON HYDRANT BRANCH 6-INCH LF	SPV.0090.5004 DUCTILE IRON WATER MAIN 6-INCH LF	SPV.0090.5005 DUCTILE IRON WATER MAIN 8-INCH LF	SPV.0090.5006 DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT LF	SPV.0090.5007 DUCTILE IRON WATER MAIN 16-INCH LF	SPV.0090.5008 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT LF	SPV.0090.5009 DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT LF	SPV.0090.5013 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY LF	SPV.0090.5014 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER W/BACKFILL SLURRY LF
7060		W. CHESTER ST.														
			44CH+67.9	9.1'LT		49CH+85.0	21.7'LT	--	--	--	--	516	--	--	--	--
			45CH+20.7	19.6'LT		--	--	--	--	--	--	--	--	--	--	--
			45CH+64.0	19.6'LT		--	--	--	--	--	--	--	--	--	--	--
			46CH+14.6	19.6'LT		--	--	--	--	--	--	--	--	--	--	--
			46CH+52.0	7.9'LT		--	--	--	--	--	--	--	--	--	--	--
			46CH+55.6	17.3'LT		--	--	7	--	--	--	--	--	--	--	--
			46CH+63.8	21.2'LT		--	--	--	--	--	--	--	--	--	--	--
			47CH+18.1	23.4'LT		--	--	--	--	--	--	--	--	--	--	--
			47CH+66.5	24.7'LT		--	--	--	--	--	--	--	--	--	--	--
			49CH+48.7	22.0'LT		--	--	8	--	--	--	--	--	--	--	--
			49CH+53.7	22.0'LT		--	--	--	--	--	--	--	--	--	--	--
			49CH+53.2	30.5'LT		--	--	--	--	--	--	--	--	--	--	--
			49CH+57.2	22.0'LT		49CH+60.2	37.9'LT	--	--	17	--	--	--	--	--	--
			10CHWM+00.0	--		15CHWM+50.0	--	--	--	--	--	550	--	--	--	--
			10CHWM+24.7	9.6'LT		10CHWM+26.6	--	--	--	--	--	10	--	--	--	--
			10CHWM+68.4	--		--	--	--	--	--	--	--	--	--	--	--
			14CHWM+01.7	--		14CHWM+07.0	--	--	--	35	--	--	--	--	--	--
			14CHWM+23.6	57.8'RT		--	--	--	--	--	--	--	--	--	--	--
			14CHWM+24.5	20.4'LT		--	--	23	--	--	--	--	--	--	--	--
			15CHWM+50.0	--		16CHWM+46.9	--	--	--	--	--	97	--	--	--	--
			16CHWM+46.9	--		20CHWM+21.1	--	--	--	295	--	--	--	--	--	--
			16CHWM+74.4	--		--	--	--	--	--	--	--	--	--	--	--
			17CHWM+94.8	23.5'RT		--	--	--	--	--	--	--	--	--	--	--
			18CHWM+13.5	--		18CHWM+14.4	12.7'LT	--	--	13	--	--	--	--	--	--
			18CHWM+53.5	--		--	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						38	--	360	--	1,173	--	--	--	--
7060		W. 92ND ST.														
			50TJWM+00.0	--		50TJWM+29.5	--	--	--	--	--	--	35	--	--	--
			50TJWM+29.5	--		53TJWM+46.3	--	--	--	--	--	--	--	--	--	--
			53TJWM+46.3	--		54TJWM+05.1	--	--	--	--	--	--	65	--	--	--
		SUBTOTALS						--	--	--	--	--	100	--	--	--
7060		W. ADLER ST.														
			983AD+60.0	11.7'RT		989AD+00.0	4.0'RT	--	--	411	--	125	--	--	--	--
			983AD+70.9	9.6'RT		--	--	13	--	--	--	--	--	--	--	--
			983AD+80.6	27.0'RT		--	--	--	--	--	--	--	--	--	--	--
			984AD+24.1	4.3'RT		--	--	--	--	--	--	--	--	--	--	--
			985AD+49.1	2.1'RT		--	--	--	--	--	--	--	--	--	--	--
			986AD+02.3	2.5'RT		--	--	--	--	--	--	--	--	--	--	--
			987AD+75.5	2.7'RT		987AD+78.2	10.9'RT	--	--	9	--	--	--	--	--	--
			988AD+38.0	3.6'RT		--	--	--	--	--	--	--	--	--	--	--
			988AD+75.9	3.4'RT		--	--	--	--	--	--	--	--	--	--	--

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1861
August 12, 2014

(CONTINUED ON NEXT SHEET)

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	SPV.0090.5003 DUCTILE IRON HYDRANT BRANCH 6-INCH LF	SPV.0090.5004 DUCTILE IRON WATER MAIN 6-INCH LF	SPV.0090.5005 DUCTILE IRON WATER MAIN 8-INCH LF	SPV.0090.5006 DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT LF	SPV.0090.5007 DUCTILE IRON WATER MAIN 16-INCH LF	SPV.0090.5008 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT LF	SPV.0090.5009 DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT LF	SPV.0090.5013 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY LF	SPV.0090.5014 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER W/BACKFILL SLURRY LF
7060			989AD+00.0	4.0'RT		993AD+50.0	.5'LT	--	--	--	--	450	--	--	--	--
			989AD+12.3	2.8'RT		--	--	--	--	--	--	--	--	--	--	--
			989AD+52.1	2.2'RT		--	--	--	--	--	--	--	--	--	--	--
			989AD+77.5	1.8'RT		--	--	--	--	--	--	--	--	--	--	--
			990AD+23.5	1.6'RT		990AD+40.0	32.7'RT	--	--	39	--	--	--	--	--	--
			990AD+52.6	1.6'RT		--	--	23	--	--	--	--	--	--	--	--
			990AD+57.6	17.6'LT		--	--	--	--	--	--	--	--	--	--	--
			990AD+74.9	1.5'RT		--	--	--	--	--	--	--	--	--	--	--
			991AD+06.5	1.5'RT		--	--	--	--	--	--	--	--	--	--	--
			991AD+38.9	1.4'RT		--	--	--	--	--	--	--	--	--	--	--
			992AD+04.9	1.2'RT		--	--	--	--	--	--	--	--	--	--	--
			992AD+37.2	1.2'RT		--	--	--	--	--	--	--	--	--	--	--
			992AD+86.7	1.1'RT		992AD+98.7	23.0'RT	--	27	--	--	--	--	--	--	--
			993AD+50.0	.5'LT		997AD+00.0	11.2'RT	--	--	--	--	357	--	--	--	--
			993AD+66.2	--		--	--	--	--	--	--	--	--	--	--	--
			993AD+98.7	.4'LT		--	--	--	--	--	--	--	--	--	--	--
			994AD+31.9	.7'LT		--	--	--	--	--	--	--	--	--	--	--
			994AD+62.6	1.0'LT		--	--	--	--	--	--	--	--	--	--	--
			996AD+09.6	24.3'LT		--	--	--	--	--	--	--	--	--	--	--
			996AD+38.0	11.3'RT		--	--	--	--	--	--	--	--	--	--	--
			996AD+49.3	11.2'RT		--	--	12	--	--	--	--	--	--	--	--
			996AD+97.0	11.0'RT		--	--	--	--	--	--	--	--	--	--	--
			997AD+00.0	11.2'RT		999AD+50.0	10.3'RT	--	--	--	--	251	--	--	--	--
			998AD+57.7	10.4'RT		998AD+55.4	26.6'RT	--	17	--	--	--	--	--	--	--
			998AD+76.3	23.4'LT		--	--	--	--	--	--	--	--	--	--	--
			998AD+77.3	10.3'RT		--	--	12	--	--	--	--	--	--	--	--
			999AD+50.0	10.3'RT		1002AD+35.0	11.8'LT	--	--	--	--	295	--	--	--	--
			999AD+61.11	10.3'RT		--	--	--	--	--	--	--	--	--	--	--
			1000AD+27.4	10.2'RT		--	--	--	--	--	--	--	--	--	--	--
			1001AD+16.2	10.2'RT		1001AD+14.5	26.9'RT	--	18	--	--	--	--	--	--	--
			1001AD+36.5	22.8'RT		--	--	13	--	--	--	--	--	--	--	--
			1001AD+44.9	23.3'LT		--	--	--	--	--	--	--	--	--	--	--
			1003AD+70.8	11.6'LT		1003AD+76.8	11.9'LT	--	--	--	--	6	--	--	--	--
			1003AD+73.6	22.9'LT		--	--	--	--	--	--	--	--	--	--	--
			1003AD+73.8	11.6'LT		1003AD+73.8	8.6'LT	--	3	--	--	--	--	--	--	--
			1003AD+95.4	13.2'LT		1004AD+05.4	13.1'LT	--	--	--	--	10	--	--	--	--
			1003AD+98.4	13.2'LT		--	--	36	--	--	--	--	--	--	--	--
			1006AD+53.1	12.5'LT		1006AD+60.1	12.5'LT	--	--	--	--	7	--	--	--	--
			1006AD+56.6	12.5'LT		--	--	35	--	--	--	--	--	--	--	--
			1008AD+94.7	19.0'RT		1008AD+94.7	26.0'RT	--	7	--	--	--	--	--	--	--
			1009AD+14.7	22.4'RT		--	--	20	--	--	--	--	--	--	--	--
			1009AD+19.4	23.2'LT		--	--	--	--	--	--	--	--	--	--	--
			1010AD+82.8	11.8'LT		1010AD+92.6	11.7'LT	--	--	--	--	12	--	--	--	--
			1010AD+87.7	11.7'LT		1015AD+00.0	6.6'RT	--	--	--	--	431	--	--	--	--

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Addendum No. 2
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Revised Sheet 1862
August 12, 2014

(CONTINUED ON NEXT SHEET)

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	SPV.0090.5003 DUCTILE IRON HYDRANT BRANCH 6-INCH LF	SPV.0090.5004 DUCTILE IRON WATER MAIN 6-INCH LF	SPV.0090.5005 DUCTILE IRON WATER MAIN 8-INCH LF	SPV.0090.5006 DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT LF	SPV.0090.5007 DUCTILE IRON WATER MAIN 16-INCH LF	SPV.0090.5008 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT LF	SPV.0090.5009 DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT LF	SPV.0090.5013 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY LF	SPV.0090.5014 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER W/BACKFILL SLURRY LF
7060			1011AD+78.6	10.1'RT		--	--	12	--	--	--	--	--	--	--	--
			1011AD+79.4	22.9'LT		--	--	--	--	--	--	--	--	--	--	--
			1012AD+24.3	10.0'RT		--	--	--	--	--	--	--	--	--	--	--
			1012AD+58.8	9.9'RT		--	--	--	--	--	--	--	--	--	--	--
			1013AD+24.0	9.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1013AD+60.9	9.6'RT		--	--	--	--	--	--	--	--	--	--	--
			1014AD+37.7	24.6'LT		--	--	--	--	--	--	--	--	--	--	--
			1014AD+38.5	11.5'RT		--	--	12	--	--	--	--	--	--	--	--
			1015AD+00.0	6.6'RT		1019AD+59.0	12.9'LT	--	--	--	--	477	--	--	--	--
			1015AD+26.0	4.9'RT		--	--	--	--	--	--	--	--	--	--	--
			1019AD+29.5	22.7'LT		1019AD+29.9	26.7'LT	--	--	--	--	4	--	--	--	--
			1019AD+49.0	21.6'LT		1019AD+49.2	25.6'LT	--	--	--	--	4	--	--	--	--
			1019AD+51.8	13.1'LT		1019AD+63.8	12.7'LT	--	--	--	--	12	--	--	--	--
			1023AD+34.6	17.4'LT		1023AD+42.9	18.6'LT	--	--	--	--	8	--	--	--	--
			1023AD+39.9	18.2'LT		--	--	7	--	--	--	--	--	--	--	--
			1023AD+77.3	21.4'LT		1023AD+84.8	21.5'LT	--	--	--	--	7	--	--	--	--
			1023AD+79.8	37.0'LT		--	--	--	--	--	--	--	--	--	--	--
			35F+61.6	49.6'RT		--	--	12	--	--	--	--	--	--	--	--
		SUBTOTALS						207	72	459	--	2,456	--	--	--	--
7060		S. 87TH PL.														
			1011AD+55.4	10.1'RT		1011AD+51.5	328.8'RT	--	319	--	--	--	--	--	--	--
			1011AD+55.1	31.5'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+54.4	81.5'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+54.2	94.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+53.0	175.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+53.0	178.8'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+52.0	246.2'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+52.0	248.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+51.5	284.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+51.3	295.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+51.1	312.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1011AD+51.5	328.8'RT		--	--	6	--	--	--	--	--	--	--	--
			1011AD+49.6	335.4'RT		--	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						6	319	--	--	--	--	--	--	--
7060		S. 87TH ST.														
			1014AD+13.2	11.7'RT		1015AD+60.3	330.6'RT	--	322	--	--	--	--	--	--	--
			1014AD+12.4	91.8'RT		--	--	--	--	--	--	--	--	--	--	--
			1014AD+10.9	160.4'RT		--	--	--	--	--	--	--	--	--	--	--
			1014AD+10.3	181.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1014AD+09.2	243.4'RT		--	--	--	--	--	--	--	--	--	--	--
			1014AD+09.1	248.8'RT		--	--	--	--	--	--	--	--	--	--	--
			1015AD+50.0	308.8'RT		--	--	--	--	--	--	--	--	--	--	--
			1015AD+53.0	315.3'RT		--	--	--	--	--	--	--	--	--	--	--

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1863
August 12, 2014

(CONTINUED ON NEXT SHEET)

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\030247_mq_uti.ppt PLOT DATE : 8/7/2014 3:18:34 PM PLOT BY : MSCCEJ PLOT NAME : 030247_mq_uti9 PLOT SCALE : 1:1

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	SPV.0090.5003 DUCTILE IRON HYDRANT BRANCH 6-INCH LF	SPV.0090.5004 DUCTILE IRON WATER MAIN 6-INCH LF	SPV.0090.5005 DUCTILE IRON WATER MAIN 8-INCH LF	SPV.0090.5006 DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT LF	SPV.0090.5007 DUCTILE IRON WATER MAIN 16-INCH LF	SPV.0090.5008 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT LF	SPV.0090.5009 DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT LF	SPV.0090.5013 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY LF	SPV.0090.5014 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER W/BACKFILL SLURRY LF
7060			1015AD+60.0	330.0'RT		1015AD+69.0	325.7'RT	10	--	--	--	--	--	--	--	--
			1015AD+70.3	327.4'RT		--	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						10	322	--	--	--	--	--	--	--
7060		S. 86TH ST.														
			1016AD+96.0	4.4'LT		1019AD+57.7	233.5'RT	--	273	--	--	--	--	--	--	--
			1017AD+13.2	38.8'RT		--	--	--	--	--	--	--	--	--	--	--
			1017AD+23.5	60.9'RT		--	--	--	--	--	--	--	--	--	--	--
			1017AD+38.4	92.6'RT		--	--	--	--	--	--	--	--	--	--	--
			1017AD+53.6	125.1'RT		--	--	--	--	--	--	--	--	--	--	--
			1017AD+56.7	131.5'RT		--	--	--	--	--	--	--	--	--	--	--
			1017AD+69.4	158.6'RT		--	--	--	--	--	--	--	--	--	--	--
			1017AD+75.0	170.5'RT		--	--	--	--	--	--	--	--	--	--	--
			1017AD+88.5	199.4'RT		--	--	--	--	--	--	--	--	--	--	--
			1018AD+81.8	211.8'RT		--	--	--	--	--	--	--	--	--	--	--
			1018AD+85.1	222.1'RT		--	--	--	--	--	--	--	--	--	--	--
			1019AD+43.5	226.7'RT		--	--	--	--	--	--	--	--	--	--	--
			1019AD+57.1	233.1'RT		--	--	8	--	--	--	--	--	--	--	--
			1019AD+71.0	243.2'RT		--	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						8	273	--	--	--	--	--	--	--
7060		ZOOLOGICAL SOCIETY														
			24BCWM+09.9	--		28BCWM+30.2	--	--	--	--	--	--	--	--	--	--
		SUBTOTALS						--	--	--	--	--	--	--	--	--
7060		I-94 CROSSING														
			10WM+05.5	--		10WM+19.0	--	--	--	--	16	--	--	--	--	--
			10WM+19.0	--		10WM+45.0	--	--	--	--	--	--	--	--	--	--
			12WM+43.4	--		13WM+33.6	--	--	--	--	--	--	--	--	--	--
			13WM+33.6	--		13WM+79.8	--	--	--	--	6	--	--	--	--	--
		SUBTOTALS						--	--	--	22	--	--	--	--	--
7060		O' CONNOR STREET														
			738FA+08.7	45.8'LT		--	--	--	--	--	--	--	--	--	--	--
			740FA+20.2	6.8'LT		741FA+94.2	5.2'LT	--	--	--	--	135	--	--	--	--
			740FA+98.2	4.5'LT		741FA+03.0	39.4'LT	--	--	38	--	--	--	--	--	--
			741FA+48.6	5.2'LT		--	--	--	--	--	--	--	--	--	--	--
			741FA+57.8	4.6'LT		--	--	19	--	--	--	--	--	--	--	--
			544CR+94.4	22.6'LT		--	--	12	--	--	--	--	--	--	--	--
			579CR+26.1	22.6'LT		--	--	11	--	--	--	--	--	--	--	--
		SUBTOTALS						42	--	38	--	135	--	--	--	--
7060		N. 95TH STREET														
			203BL+12.8	51.4'RT		--	--	6	--	--	--	7	--	--	--	--
		SUBTOTALS						6	--	--	--	7	--	--	--	--

Addendum No. 2
ID 1060-33-80
Revised Sheet 1864
August 12, 2014

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(CONTINUED ON NEXT SHEET)

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	SPV.0090.5003 DUCTILE IRON HYDRANT BRANCH 6-INCH LF	SPV.0090.5004 DUCTILE IRON WATER MAIN 6-INCH LF	SPV.0090.5005 DUCTILE IRON WATER MAIN 8-INCH LF	SPV.0090.5006 DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT LF	SPV.0090.5007 DUCTILE IRON WATER MAIN 16-INCH LF	SPV.0090.5008 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT LF	SPV.0090.5009 DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT LF	SPV.0090.5013 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY LF	SPV.0090.5014 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER W/BACKFILL SLURRY LF
7060		W. DIXON STREET														
			10CRWM+50.0	--		10CRWM+94.5	--	--	3	42	--	--	--	--	--	--
		SUBTOTALS						--	3	42	--	--	--	--	--	--
7060		W. BLUEMOUND ROAD														
			10BLWM+55	--		12BLWM+15	--	--	--	--	--	161	--	--	--	--
			12BLWM+15	--		12BLWM+37	--	--	--	--	--	--	--	--	30	--
			10BLWM+74	--		--	--	10	--	--	--	--	--	--	--	--
			11BLWM+17	--		11BLWM+20	14.04' RT	--	15	--	--	--	--	--	--	--
			11BLWM+42	18.50' LT		--	--	--	--	--	--	--	--	--	--	--
			12BLWM+37	--		15BLWM+11	--	--	--	--	--	--	--	--	--	275
			15BLWM+11	--		15BLWM+41	--	--	--	--	--	--	--	--	41	--
			15BLWM+36	2' LT		15BLWM+36	2' RT	--	--	--	--	--	--	--	--	--
			15BLWM+41	--		17BLWM+49	--	--	--	--	--	208	--	--	--	--
			16BLWM+16	2' LT		16BLWM+16	2' RT	--	--	--	--	--	--	--	--	--
			17BLWM+20	3.72' RT		--	--	--	--	--	--	--	--	--	--	--
			17BLWM+28	--		--	--	12	--	--	--	--	--	--	--	--
		SUBTOTALS						22	15	--	--	369	--	--	71	275
7060		CATEGORY TOTAL						339	1,004	899	22	4,140	100	--	71	275
7065		I-94 CROSSING														
			12WM+43.4	--		13WM+33.6	--	--	--	--	--	--	--	--	--	--
			13WM+33.6	--		13WM+79.8	--	--	--	--	49	--	--	--	--	--
		SUBTOTAL						--	--	--	49	--	--	--	--	--
7065		ZOOLOGICAL SOCIETY														
			11BCWM+17.2	--		16BCWM+00.0	--	--	--	--	--	483	--	--	--	--
			11BCWM+30	--		--	--	4	--	--	--	--	--	--	--	--
			15BCWM+50	--		--	--	4	--	--	--	--	--	--	--	--
			15BCWM+82.1	207.6'RT		--	--	--	--	--	--	--	--	--	--	--
			16BCWM+00.0	--		22BCWM+00.0	--	--	--	--	--	600	--	--	--	--
			19BCWM+50	--		--	--	4	--	--	--	--	--	--	--	--
			22BCWM+00.0	--		24BCWM+00.0	--	--	--	--	--	200	--	--	--	--
			23BCWM+50	--		--	--	4	--	--	--	--	--	--	--	--
			24BCWM+00.0	--		24BCWM+04.9	--	--	--	--	--	5	--	--	--	--
			24BCWM+04.9	--		24BCWM+09.9	--	--	--	--	--	--	--	5	--	--
			24BCWM+09.9	--		28BCWM+30.2	--	--	--	--	--	--	--	--	--	--
			24BCWM+96.9	20.0'RT		--	--	--	--	--	--	--	--	--	--	--
			28BCWM+30.2	--		28BCWM+64.3	--	--	--	--	--	--	--	37	--	--
		SUBTOTAL						16	--	--	--	1,288	--	42	--	--

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Addendum No. 2
ID 1060-33-80
Revised Sheet 1865
August 12, 2014

CITY OF MILWAUKEE-WATER (CONTINUED)

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO	STATION	OFFSET	SPV.0090.5003 DUCTILE IRON HYDRANT BRANCH 6-INCH LF	SPV.0090.5004 DUCTILE IRON WATER MAIN 6-INCH LF	SPV.0090.5005 DUCTILE IRON WATER MAIN 8-INCH LF	SPV.0090.5006 DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT LF	SPV.0090.5007 DUCTILE IRON WATER MAIN 16-INCH LF	SPV.0090.5008 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT LF	SPV.0090.5009 DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT LF	SPV.0090.5013 DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY LF	SPV.0090.5014 STEEL CASING W/ DUCTILE IRON 16-INCH CARRIER W/BACKFILL SLURRY LF
7065		W. CHESTER ST.														
			16CHWM+46.9	--		20CHWM+21.1	--	--	--	80	--	--	--	--	--	--
			19CHWM+98.4	--		--	--	6	--	--	--	--	--	--	--	--
		SUBTOTAL						6	--	80	--	--	--	--	--	--
7065		O' CONNOR STREET														
			740FA+20.2	6.8'LT		741FA+94.2	5.2'LT	--	--	--	--	41	--	--	--	--
		SUBTOTAL						--	--	--	--	41	--	--	--	--
7065		CATEGORY TOTAL						22	--	80	49	1,329	--	42	--	--
		PROJECT TOTAL						361	1,004	979	71	5,469	100	42	71	275

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*ADDITIONAL QUANTITIES SHOWN ELSEWHERE

Addendum No. 2
ID 1060-33-80
Added Sheet 1865A
August 12, 2014

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	MISCELLANEOUS QUANTITIES	SHEET: 1865A	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\030247_mq_uti.ppt PLOT DATE : 8/7/2014 3:18:34 PM PLOT BY : MSCCEJ PLOT NAME : 030247_mq_uti12 PLOT SCALE : 1:1

MMSD

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	TO STATION	OFFSET	SPV.0060.5106 ABANDONING MMSD SANITARY MANHOLE EACH	SPV.0060.5107 PARTIAL ABANDONMENT OF MMSD SANITARY MANHOLE EACH	SPV.0060.5108 ABANDONING MMSD ACCESS PANEL EACH	SPV.0060.5109 MMSD SANITARY SEWER MANHOLE, 48-INCH EACH	SPV.0060.5110 MMSD SANITARY MANHOLE VACUUM TEST EACH	SPV.0090.5120 ABANDONING SANITARY SEWER, 24-INCH LF
1000	4	S. 84TH STREET										
			37F+33	10' RT	--	--	--	1	--	--	--	--
			41F+57	13' RT	--	--	1	--	--	--	--	--
			41F+57	13' RT	43F+32	13' RT	--	--	--	--	--	184
			43F+32	13' RT	--	--	--	--	--	1	1	--
		CATEGORY TOTAL					1	1	--	1	1	184
7047	4	S. 84TH STREET										
			37F+24	37' RT	--	--	--	--	1	--	--	--
		CATEGORY TOTAL					--	--	1	--	--	--
		PROJECT TOTAL					1	1	1	1	1	184

BOOSTER STATIONS

CATEGORY	STAGE	ROADWAY	STATION	OFFSET	SPV.0105.5000 ADLER WATER BOOSTER STATION LS	SPV.0105.5001 REMOVING OLD BOOSTER STATION LS	SPV.0105.5002 BURLEIGH WATER BOOSTER STATION LS
7060	1	ADLER STREET					
			1019AD+41	36' LT	1	--	--
			1010AD+96	28' LT	--	1	--
		CATEGORY TOTAL			1	1	--
7030	1	BURLEIGH STREET					
			--	--	--	--	1
		CATEGORY TOTAL			--	--	1
		PROJECT TOTAL			1	1	1

Addendum No. 2
ID 1060-33-80
Revised Sheet 1881
August 12, 2014

Division 1 USH 45 NB R-40-557

STATION		Real Station	Distance	AREA (SF) Cut	AREA (SF) Salvaged/ Unusable Pavement Material	AREA (SF) Fill	AREA (SF) EBS	Incremental Vol (CY) (Unadjusted) Cut Note 1	Incremental Vol (CY) (Unadjusted) Salvaged/ Unusable Pavement Material Note 2	Incremental Vol (CY) (Unadjusted) Fill Note 3	Incremental Vol (CY) (Unadjusted) EBS	Cumulative Vol (CY) Cut 1.0	Cumulative Vol (CY) Expanded Fill 1.2	Cumulative Vol (CY) Expanded EBS Backfill 1.3 Note 4	Cumulative Vol (CY) Reduced EBS In Fill 0.8 Note 5	Mass Ordinate Note 6
317+04	AH	31704.00	0.00	144.00	0.00	315.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
317+50		31750.00	46.00	151.00	0.00	341.00	0.00	251.30	0.00	558.81	0.00	251.30	670.58	0.00	0.00	-419.28
318+00		31800.00	50.00	160.00	0.00	379.00	0.00	287.96	0.00	666.67	0.00	539.26	1470.58	0.00	0.00	-931.32
318+50		31850.00	50.00	87.00	0.00	385.00	0.00	228.70	0.00	707.41	0.00	767.96	2319.47	0.00	0.00	-1551.50
319+00		31900.00	50.00	119.00	0.00	382.00	0.00	190.74	0.00	710.19	0.00	958.70	3171.69	0.00	0.00	-2212.99
319+50		31950.00	50.00	157.00	0.00	387.00	0.00	255.56	0.00	712.04	0.00	1214.26	4026.13	0.00	0.00	-2811.87
320+00		32000.00	50.00	217.00	0.00	436.00	0.00	346.30	0.00	762.04	0.00	1560.56	4940.58	0.00	0.00	-3380.02
320+50		32050.00	50.00	278.00	0.00	657.00	0.00	458.33	0.00	1012.04	0.00	2018.89	6155.02	0.00	0.00	-4136.13
321+00		32100.00	50.00	356.00	0.00	914.00	0.00	587.04	0.00	1454.63	0.00	2605.93	7900.58	0.00	0.00	-5294.65
321+50		32150.00	50.00	328.00	0.00	694.00	0.00	633.33	0.00	1488.89	0.00	3239.26	9687.24	0.00	0.00	-6447.99
322+00		32200.00	50.00	324.00	0.00	700.00	0.00	603.70	0.00	1290.74	0.00	3842.96	11236.13	0.00	0.00	-7393.17
322+50		32250.00	50.00	0.00	0.00	561.00	0.00	300.00	0.00	1167.59	0.00	4142.96	12637.24	0.00	0.00	-8494.28
323+00		32300.00	50.00	0.00	0.00	616.00	0.00	0.00	0.00	1089.81	0.00	4142.96	13945.02	0.00	0.00	-9802.06
323+50		32350.00	50.00	0.00	0.00	653.00	0.00	0.00	0.00	1175.00	0.00	4142.96	15355.02	0.00	0.00	-11212.06
324+00		32400.00	50.00	138.00	0.00	656.00	0.00	127.78	0.00	1212.04	0.00	4270.74	16809.47	0.00	0.00	-12538.73
324+50		32450.00	50.00	0.00	0.00	621.00	0.00	127.78	0.00	1182.41	0.00	4398.52	18228.36	0.00	0.00	-13829.84
324+97	BK	32497.00	47.00	0.00	0.00	362.00	0.00	0.00	0.00	855.57	0.00	4398.52	19255.04	0.00	0.00	-14856.53
						Column totals		4398.52	0.00	16045.87	0.00					

2

Addendum No. 2
ID 1060-33-80
Revised Sheet 3406
August 12, 2014

Notes:	
1 - Cut	Cut includes Salvaged/Unusable Pavement material
2 - Salvaged/Unusable Pavement Material	This does not show up in cross sections nor is it shown in these sheets. Refer to Summary Table for this roadway's quantity.
3 - Fill	Does not include Unusable Pavement Exc volume
4 - Expanded EBS	Will be backfilled with Borrow
5 - Reduced EBS in Fill	Reduced EBS Excavation that can be used in Fill
6 - Mass Ordinate	If EBS to be backfilled with Cut or Borrow: [(Cut + EBS) - ((Fill) - (Reduced EBS in Fill)) * Fill Factor)]

PROJECT NO: 1060-33-80	HWY: USH 45 /IH 94/ IH 894	COUNTY: MILWAUKEE	EARTHWORK	SHEET: 3406	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\090101_ew.ppt PLOT DATE : 8/7/2014 11:02:49 AM PLOT BY : MSCCEJ PLOT NAME : 090101_ew1 PLOT SCALE : 1:1

Division 1 NSC

STATION	Real Station	Distance	AREA (SF)				Incremental Vol (CY) (Unadjusted)				Cumulative Vol (CY)				Mass Ordinate
			Cut	Salvaged/ Unusable Pavement Material	Fill	EBS	Cut	Salvaged/ Unusable Pavement Material	Fill	EBS	Cut 1.0	Expanded Fill 1.2	Expanded EBS Backfill 1.3	Reduced EBS In Fill 0.8	
							Note 1	Note 2	Note 3				Note 4	Note 5	Note 6
10+00 AH	1000.47	0.00	328.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10+50	1050.00	49.53	678.51	0.00	0.00	0.00	923.74	0.00	0.00	0.00	923.74	0.00	0.00	0.00	923.74
11+00	1100.00	50.00	883.71	0.00	0.00	0.00	1446.50	0.00	0.00	0.00	2370.24	0.00	0.00	0.00	2370.24
11+50	1150.00	50.00	323.43	0.00	0.00	0.00	1117.72	0.00	0.00	0.00	3487.97	0.00	0.00	0.00	3487.97
12+00	1200.00	50.00	411.30	0.00	0.00	0.00	680.31	0.00	0.00	0.00	4168.27	0.00	0.00	0.00	4168.27
12+50	1250.00	50.00	498.09	0.00	0.00	0.00	842.03	0.00	0.00	0.00	5010.30	0.00	0.00	0.00	5010.30
13+00	1300.00	50.00	579.51	0.00	0.00	0.00	997.78	0.00	0.00	0.00	6008.08	0.00	0.00	0.00	6008.08
13+50	1350.00	50.00	705.15	0.00	0.00	0.00	1189.50	0.00	0.00	0.00	7197.58	0.00	0.00	0.00	7197.58
14+00	1400.00	50.00	1098.40	0.00	0.00	0.00	1669.95	0.00	0.00	0.00	8867.53	0.00	0.00	0.00	8867.53
14+50	1450.00	50.00	1066.96	0.00	0.00	0.00	2004.96	0.00	0.00	0.00	10872.49	0.00	0.00	0.00	10872.49
15+00	1500.00	50.00	922.37	0.00	0.00	0.00	1841.97	0.00	0.00	0.00	12714.47	0.00	0.00	0.00	12714.47
15+50	1550.00	50.00	986.46	0.00	0.00	0.00	1767.44	0.00	0.00	0.00	14481.90	0.00	0.00	0.00	14481.90
16+00	1600.00	50.00	1087.64	0.00	0.00	0.00	1920.46	0.00	0.00	0.00	16402.36	0.00	0.00	0.00	16402.36
16+50	1650.00	50.00	806.80	0.00	0.00	0.00	1754.11	0.00	0.00	0.00	18156.48	0.00	0.00	0.00	18156.48
17+00	1700.00	50.00	824.52	0.00	0.00	0.00	1510.48	0.00	0.00	0.00	19666.96	0.00	0.00	0.00	19666.96
17+50	1750.00	50.00	957.51	0.00	0.00	0.00	1650.03	0.00	0.00	0.00	21316.98	0.00	0.00	0.00	21316.98
18+00	1800.00	50.00	1113.10	0.00	0.00	0.00	1917.23	0.00	0.00	0.00	23234.22	0.00	0.00	0.00	23234.22
18+50	1850.00	50.00	1207.19	0.00	0.00	0.00	2148.42	0.00	0.00	0.00	25382.63	0.00	0.00	0.00	25382.63
19+00	1900.00	50.00	1172.05	0.00	0.00	0.00	2203.00	0.00	0.00	0.00	27585.63	0.00	0.00	0.00	27585.63
19+50	1950.00	50.00	618.00	0.00	60.03	0.00	1657.45	0.00	55.58	0.00	29243.09	66.70	0.00	0.00	29176.39
20+00	2000.00	50.00	779.06	0.00	28.07	0.00	1293.57	0.00	81.57	0.00	30536.66	164.59	0.00	0.00	30372.07
20+50	2050.00	50.00	891.87	0.00	8.94	0.00	1547.16	0.00	34.27	0.00	32083.82	205.71	0.00	0.00	31878.11
21+00	2100.00	50.00	1049.38	0.00	0.00	0.00	1797.45	0.00	8.28	0.00	33881.27	215.64	0.00	0.00	33665.63
21+50	2150.00	50.00	1746.83	0.00	0.00	0.00	2589.08	0.00	0.00	0.00	36470.35	215.64	0.00	0.00	36254.71

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Addendum No. 2
ID 1060-33-80
Revised Sheet 3418
August 12, 2014

Notes:	
1 - Cut	Cut includes Salvaged/Unusable Pavement material
2 - Salvaged/Unusable Pavement Material	This does not show up in cross sections nor is it shown in these sheets. Refer to Summary Table for this roadway's quantity.
3 - Fill	Does not include Unusable Pavement Exc volume
4 - Expanded EBS	Will be backfilled with Borrow
5 - Reduced EBS in Fill	Reduced EBS Excavation that can be used in Fill
6 - Mass Ordinate	If EBS to be backfilled with Cut or Borrow: [(Cut + EBS) - ((Fill) - (Reduced EBS in Fill)) * Fill Factor)]

(CONTINUED ON NEXT PAGE)

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\090101_ew.ppt PLOT DATE : 7/23/2014 8:17:18 AM PLOT BY : MSCCEJ PLOT NAME : 090101_ew13 PLOT SCALE : 1:1

(CONTINUED)

Division 1 NSC

STATION		Real Station	Distance	AREA (SF) Cut	AREA (SF) Salvaged/ Unusable Pavement Material	AREA (SF) Fill	AREA (SF) EBS	Incremental Vol (CY) (Unadjusted) Cut Note 1	Incremental Vol (CY) (Unadjusted) Salvaged/ Unusable Pavement Material Note 2	Incremental Vol (CY) (Unadjusted) Fill Note 3	Incremental Vol (CY) (Unadjusted) EBS	Cumulative Vol (CY) Cut 1.0	Cumulative Vol (CY) Expanded Fill 1.2	Cumulative Vol (CY) Expanded EBS Backfill 1.3 Note 4	Cumulative Vol (CY) Reduced EBS In Fill 0.8 Note 5	Mass Ordinate Note 6
22+00		2200.00	50.00	1729.72	0.00	0.00	0.00	3219.03	0.00	0.00	0.00	39689.38	215.64	0.00	0.00	39473.74
22+50		2250.00	50.00	1639.61	0.00	0.00	0.00	3119.75	0.00	0.00	0.00	42809.13	215.64	0.00	0.00	42593.49
23+00		2300.00	50.00	1250.73	0.00	0.00	0.00	2676.24	0.00	0.00	0.00	45485.37	215.64	0.00	0.00	45269.73
23+50		2350.00	50.00	837.41	0.00	0.00	0.00	1933.46	0.00	0.00	0.00	47418.84	215.64	0.00	0.00	47203.19
24+00		2400.00	50.00	873.03	0.00	0.00	0.00	1583.74	0.00	0.00	0.00	49002.58	215.64	0.00	0.00	48786.93
24+50		2450.00	50.00	484.18	0.00	0.00	0.00	1256.68	0.00	0.00	0.00	50259.25	215.64	0.00	0.00	50043.61
25+00		2500.00	50.00	356.57	0.00	0.00	0.00	778.47	0.00	0.00	0.00	51037.73	215.64	0.00	0.00	50822.08
25+50		2550.00	50.00	257.35	0.00	0.00	0.00	568.44	0.00	0.00	0.00	51606.17	215.64	0.00	0.00	51390.53
26+00		2600.00	50.00	188.58	0.00	0.00	0.00	412.90	0.00	0.00	0.00	52019.07	215.64	0.00	0.00	51803.42
26+50		2650.00	50.00	145.71	0.00	0.00	0.00	309.53	0.00	0.00	0.00	52328.60	215.64	0.00	0.00	52112.95
27+00		2700.00	50.00	137.78	0.00	0.00	0.00	262.49	0.00	0.00	0.00	52591.09	215.64	0.00	0.00	52375.44
27+50		2750.00	50.00	173.02	0.00	0.00	0.00	287.78	0.00	0.00	0.00	52878.86	215.64	0.00	0.00	52663.22
28+00		2800.00	50.00	193.92	0.00	0.00	0.00	339.76	0.00	0.00	0.00	53218.62	215.64	0.00	0.00	53002.98
28+50		2850.00	50.00	143.95	0.00	0.00	0.00	312.84	0.00	0.00	0.00	53531.47	215.64	0.00	0.00	53315.82
29+00		2900.00	50.00	83.11	0.00	0.00	0.00	210.24	0.00	0.00	0.00	53741.71	215.64	0.00	0.00	53526.06
29+50		2950.00	50.00	67.93	0.00	0.00	0.00	139.85	0.00	0.00	0.00	53881.56	215.64	0.00	0.00	53665.91
30+00		3000.00	50.00	50.46	0.00	0.00	0.00	109.62	0.00	0.00	0.00	53991.18	215.64	0.00	0.00	53775.53
30+50		3050.00	50.00	45.12	0.00	0.00	0.00	88.50	0.00	0.00	0.00	54079.68	215.64	0.00	0.00	53864.03
31+00		3100.00	50.00	41.08	0.00	0.00	0.00	79.81	0.00	0.00	0.00	54159.49	215.64	0.00	0.00	53943.85
31+50		3150.00	50.00	38.84	0.00	0.00	0.00	74.00	0.00	0.00	0.00	54233.49	215.64	0.00	0.00	54017.85
32+00		3200.00	50.00	38.85	0.00	0.00	0.00	71.94	0.00	0.00	0.00	54305.43	215.64	0.00	0.00	54089.78
32+46	BK	3246.27	46.27	51.78	0.00	0.00	0.00	77.66	0.00	0.00	0.00	54383.09	215.64	0.00	0.00	54167.44
						Column totals		54383.09	0.00	179.70	0.00					

2

Addendum No. 2
ID 1060-33-80
Revised Sheet 3419
August 12, 2014

Notes:	
1 - Cut	Cut includes Salvaged/Unusable Pavement material
2 - Salvaged/Unusable Pavement Material	This does not show up in cross sections nor is it shown in these sheets. Refer to Summary Table for this roadway's quantity.
3 - Fill	Does not include Unusable Pavement Exc volume
4 - Expanded EBS	Will be backfilled with Borrow
5 - Reduced EBS in Fill	Reduced EBS Excavation that can be used in Fill
6 - Mass Ordinate	If EBS to be backfilled with Cut or Borrow: [(Cut + EBS) - ((Fill) - (Reduced EBS in Fill)) * Fill Factor)]

9

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\090101_ew.ppt PLOT DATE : 7/23/2014 8:17:18 AM PLOT BY : MSCCEJ PLOT NAME : 090101_ew14 PLOT SCALE : 1:1

Division 2 IH94 CORE GRADING

STATION		Real Station	Distance	AREA (SF) Cut	AREA (SF) Salvaged/ Unusable Pavement Material	AREA (SF) Fill	AREA (SF) EBS	Incremental Vol (CY) (Unadjusted) Cut Note 1	Incremental Vol (CY) (Unadjusted) Salvaged/ Unusable Pavement Material Note 2	Incremental Vol (CY) (Unadjusted) Fill Note 3	Incremental Vol (CY) (Unadjusted) EBS	Cumulative Vol (CY) Cut 1.00	Cumulative Vol (CY) Expanded Fill 1.2	Cumulative Vol (CY) Expanded EBS Backfill 1.30 Note 4	Cumulative Vol (CY) Reduced EBS In Fill 0.80 Note 5	Mass Ordinate Note 6
178+85	AH	17885.00	0.00	5.33	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
179+00		17900.00	15.00	7.56	0.00	2.89	0.00	3.58	0.00	0.90	0.00	3.58	1.08	0.00	0.00	2.50
179+50		17950.00	50.00	24.23	0.00	8.20	0.00	29.44	0.00	10.27	0.00	33.02	13.40	0.00	0.00	19.61
180+00		18000.00	50.00	73.90	0.00	17.65	0.00	90.86	0.00	23.94	0.00	123.88	42.12	0.00	0.00	81.75
180+50		18050.00	50.00	216.50	0.00	14.30	0.00	268.89	0.00	29.58	0.00	392.77	77.62	0.00	0.00	315.14
181+00		18100.00	50.00	476.09	0.00	14.28	0.00	641.29	0.00	26.46	0.00	1034.05	109.38	0.00	0.00	924.67
181+50		18150.00	50.00	897.67	0.00	33.49	0.00	1272.00	0.00	44.23	0.00	2306.05	162.46	0.00	0.00	2143.60
182+00		18200.00	50.00	1484.88	0.00	24.70	0.00	2206.06	0.00	53.88	0.00	4512.12	227.11	0.00	0.00	4285.00
182+50		18250.00	50.00	2380.58	0.00	3.19	0.00	3579.13	0.00	25.82	0.00	8091.25	258.10	0.00	0.00	7833.15
183+00		18300.00	50.00	3135.82	0.00	0.18	0.00	5107.78	0.00	3.12	0.00	13199.03	261.85	0.00	0.00	12937.18
183+50		18350.00	50.00	3647.45	0.00	0.26	0.00	6280.81	0.00	0.41	0.00	19479.83	262.34	0.00	0.00	19217.50
184+00		18400.00	50.00	4079.17	0.00	0.00	0.00	7154.28	0.00	0.24	0.00	26634.11	262.62	0.00	0.00	26371.48
184+50		18450.00	50.00	4535.25	0.00	0.36	0.00	7976.31	0.00	0.33	0.00	34610.42	263.02	0.00	0.00	34347.40
185+00		18500.00	50.00	5558.39	0.00	0.00	0.00	9345.96	0.00	0.33	0.00	43956.39	263.42	0.00	0.00	43692.96
185+50		18550.00	50.00	4564.64	0.00	0.67	0.00	9373.18	0.00	0.62	0.00	53329.56	264.17	0.00	0.00	53065.39
186+00		18600.00	50.00	1036.41	0.00	0.15	0.00	5186.16	0.00	0.76	0.00	58515.72	265.08	0.00	0.00	58250.64
186+35	BK	18635.00	35.00	0.25	0.00	0.00	0.00	671.91	0.00	0.10	0.00	59187.63	265.20	0.00	0.00	58922.43
							Column totals	59187.63	0.00	221.00	0.00					

2

Addendum No. 2
ID 1060-33-80
Revised Sheet 3499
August 12, 2014

Notes:	
1 - Cut	Cut includes Salvaged/Unusable Pavement material
2 - Salvaged/Unusable Pavement Material	This does not show up in cross sections nor is it shown in these sheets. Refer to Summary Table for this roadway's quantity.
3 - Fill	Does not include Unusable Pavement Exc volume
4 - Expanded EBS	Will be backfilled with Borrow
5 - Reduced EBS in Fill	Reduced EBS Excavation that can be used in Fill
6 - Mass Ordinate	If EBS to be backfilled with Cut or Borrow: [(Cut + EBS) - ((Fill) - (Reduced EBS in Fill)) * Fill Factor)]

PROJECT NO: 1060-33-80	HWY: USH 45 /IH 94/ IH 894	COUNTY: MILWAUKEE	EARTHWORK	SHEET: 3499	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\090101_ew.ppt PLOT DATE : 8/5/2014 8:58:27 AM PLOT BY : MSCCEJ PLOT NAME : 090101_ew94 PLOT SCALE : 1:1

Division 4 WSA

STATION	Real Station	Distance	AREA (SF) Cut	AREA (SF) Salvaged/ Unusable Pavement Material	AREA (SF) Fill	AREA (SF) EBS	Incremental Vol (CY) (Unadjusted) Cut Note 1	Incremental Vol (CY) (Unadjusted) Salvaged/ Unusable Pavement Material Note 2	Incremental Vol (CY) (Unadjusted) Fill Note 3	Incremental Vol (CY) (Unadjusted) EBS	Cumulative Vol (CY) Cut 1.0	Cumulative Vol (CY) Expanded Fill 1.2	Cumulative Vol (CY) Expanded EBS Backfill 1.3 Note 4	Cumulative Vol (CY) Reduced EBS In Fill 0.8 Note 5	Mass Ordinate Note 6
11+50 AH	1150.00	0.00	41.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12+00	1200.00	50.00	51.37	0.00	12.78	0.00	85.63	0.00	11.83	0.00	85.63	14.20	0.00	0.00	71.43
12+50	1250.00	50.00	1.09	0.00	82.75	0.00	48.57	0.00	88.45	0.00	134.20	120.34	0.00	0.00	13.86
13+00	1300.00	50.00	0.00	0.00	89.25	0.00	1.01	0.00	159.26	0.00	135.21	311.46	0.00	0.00	-176.24
13+50	1350.00	50.00	0.55	0.00	41.97	0.00	0.51	0.00	121.50	0.00	135.72	457.26	0.00	0.00	-321.53
14+00	1400.00	50.00	13.34	0.00	95.63	0.00	12.86	0.00	127.41	0.00	148.58	610.14	0.00	0.00	-461.56
14+50	1450.00	50.00	24.49	0.00	25.06	0.00	35.03	0.00	111.75	0.00	183.61	744.24	0.00	0.00	-560.63
15+00	1500.00	50.00	46.41	0.00	11.18	0.00	65.65	0.00	33.56	0.00	249.26	784.51	0.00	0.00	-535.25
15+50	1550.00	50.00	77.29	0.00	3.47	0.00	114.54	0.00	13.56	0.00	363.80	800.79	0.00	0.00	-436.99
16+00	1600.00	50.00	87.22	0.00	8.17	0.00	152.32	0.00	10.78	0.00	516.12	813.72	0.00	0.00	-297.60
16+49 BK	1648.59	48.59	23.72	0.00	32.37	0.00	99.83	0.00	36.48	0.00	615.95	857.50	0.00	0.00	-241.55
					Column totals		615.95	0.00	714.58	0.00					

2

Notes:	
1 - Cut	Cut includes Salvaged/Unusable Pavement material
2 - Salvaged/Unusable Pavement Material	This does not show up in cross sections nor is it shown in these sheets. Refer to Summary Table for this roadway's quantity.
3 - Fill	Does not include Unusable Pavement Exc volume
4 - Expanded EBS	Will be backfilled with Borrow
5 - Reduced EBS in Fill	Reduced EBS Excavation that can be used in Fill
6 - Mass Ordinate	If EBS to be backfilled with Cut or Borrow: [(Cut + EBS) - ((Fill) - (Reduced EBS in Fill)) * Fill Factor)]

Addendum No. 2
ID 1060-33-80
Revised Sheet 3561
August 12, 2014

PROJECT NO: 1060-33-80	HWY: USH 45 /IH 94/ IH 894	COUNTY: MILWAUKEE	EARTHWORK	SHEET: 3561	E

FILE NAME : W:\Cadd\Final\10603380_Z1\Roads\cds\090101_ew.ppt PLOT DATE : 7/23/2014 8:17:18 AM PLOT BY : MSCCEJ PLOT NAME : 090101_ew156 PLOT SCALE : 1:1

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SECTION 0001 ROADWAY ITEMS					
0005	108.3100.S INCENTIVE/DISINCENTIVE FOR INTERIM COMPLETION OF WORK	0.100 CD	10000.00000		1000.00	
0010	201.0105 CLEARING	269.000 STA	.		.	
0015	201.0120 CLEARING	1,219.000 ID	.		.	
0020	201.0205 GRUBBING	269.000 STA	.		.	
0025	201.0220 GRUBBING	1,219.000 ID	.		.	
0030	203.0200 REMOVING OLD STRUCTURE (STATION) 0001. 280+00 NS	LUMP	LUMP		.	
0035	203.0200 REMOVING OLD STRUCTURE (STATION) 0002. 586SW+76.79	LUMP	LUMP		.	
0040	203.0200 REMOVING OLD STRUCTURE (STATION) 0003. 590SW+89.63	LUMP	LUMP		.	
0045	203.0200 REMOVING OLD STRUCTURE (STATION) 0004. 591SW+15.01	LUMP	LUMP		.	

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0050	203.0200 REMOVING OLD STRUCTURE (STATION) 0005. 64+02.9	LUMP	LUMP			.
0055	203.0200 REMOVING OLD STRUCTURE (STATION) 0006. 237+50	LUMP	LUMP			.
0060	203.0200 REMOVING OLD STRUCTURE (STATION) 0007. 237+60	LUMP	LUMP			.
0065	203.0200 REMOVING OLD STRUCTURE (STATION) 0008. 196+88	LUMP	LUMP			.
0070	203.0200 REMOVING OLD STRUCTURE (STATION) 0009. 197+06	LUMP	LUMP			.
0075	203.0200 REMOVING OLD STRUCTURE (STATION) 0010. 201+60	LUMP	LUMP			.
0080	203.0200 REMOVING OLD STRUCTURE (STATION) 0011. 572SA+25	LUMP	LUMP			.
0085	203.0200 REMOVING OLD STRUCTURE (STATION) 0012. 559SA+50	LUMP	LUMP			.
0090	203.0200 REMOVING OLD STRUCTURE (STATION) 0013. 26+25.00	LUMP	LUMP			.
0095	203.0200 REMOVING OLD STRUCTURE (STATION) 0014. 587SW+01.22	LUMP	LUMP			.
0100	203.0200 REMOVING OLD STRUCTURE (STATION) 0015. 2FCV+72	LUMP	LUMP			.

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CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0105	203.0200 REMOVING OLD STRUCTURE (STATION) 0016. 233EW+84	LUMP	LUMP			.
0110	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0001. B-40-88	LUMP	LUMP			.
0115	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0002. B-40-90	LUMP	LUMP			.
0120	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0003. B-40-91	LUMP	LUMP			.
0125	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0004. B-40-92	LUMP	LUMP			.
0130	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0005. B-40-0093	LUMP	LUMP			.
0135	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0006. B-40-95	LUMP	LUMP			.
0140	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0007. B-40-98	LUMP	LUMP			.
0145	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0008. B-40-99	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0150	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0009. B-40-106	LUMP	LUMP			.
0155	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0010. B-40-129	LUMP	LUMP			.
0160	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0011. B-40-130	LUMP	LUMP			.
0165	203.0210.S ABATEMENT OF ASBESTOS CONTAINING MATERIAL (STRUCTURE) 0012. B-40-131	LUMP	LUMP			.
0170	204.0100 REMOVING PAVEMENT **P**	289,718.000 SY		.		.
0175	204.0109.S REMOVING CONCRETE SURFACE PARTIAL DEPTH **P**	14,097.000 SF		.		.
0180	204.0110 REMOVING ASPHALTIC SURFACE **P**	13,409.000 SY		.		.
0185	204.0125 REMOVING ASPHALTIC SURFACE MILLING	642.000 TON		.		.
0190	204.0150 REMOVING CURB & GUTTER **P**	9,465.000 LF		.		.
0195	204.0155 REMOVING CONCRETE SIDEWALK **P**	9,825.000 SY		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0200	204.0157 REMOVING CONCRETE BARRIER **P**	41,661.000 LF		.		.
0205	204.0165 REMOVING GUARDRAIL **P**	4,064.000 LF		.		.
0210	204.0170 REMOVING FENCE **P**	28,757.000 LF		.		.
0215	204.0195 REMOVING CONCRETE BASES	194.000 EACH		.		.
0220	204.0210 REMOVING MANHOLES	137.000 EACH		.		.
0225	204.0220 REMOVING INLETS	535.000 EACH		.		.
0230	204.0245 REMOVING STORM SEWER (SIZE) 0001. 12-INCH **P**	21,289.000 LF		.		.
0235	204.0245 REMOVING STORM SEWER (SIZE) 0002. 15-INCH **P**	2,052.000 LF		.		.
0240	204.0245 REMOVING STORM SEWER (SIZE) 0003. 18-INCH **P**	1,912.000 LF		.		.
0245	204.0245 REMOVING STORM SEWER (SIZE) 0004. 21-INCH **P**	286.000 LF		.		.
0250	204.0245 REMOVING STORM SEWER (SIZE) 0005. 24-INCH **P**	921.000 LF		.		.

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CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0255	204.0245 REMOVING STORM SEWER (SIZE) 0006. 30-INCH **P**	414.000 LF		.		.
0260	204.0245 REMOVING STORM SEWER (SIZE) 0007. 36-INCH **P**	439.000 LF		.		.
0265	204.0245 REMOVING STORM SEWER (SIZE) 0008. 42-INCH **P**	3,219.000 LF		.		.
0270	204.0245 REMOVING STORM SEWER (SIZE) 0009. 48-INCH **P**	2,181.000 LF		.		.
0275	204.0245 REMOVING STORM SEWER (SIZE) 0010. 54-INCH **P**	668.000 LF		.		.
0280	204.0245 REMOVING STORM SEWER (SIZE) 0013. 72-INCH **P**	225.000 LF		.		.
0285	204.0245 REMOVING STORM SEWER (SIZE) 0100. 8-INCH **P**	135.000 LF		.		.
0290	204.0280 SEALING PIPES	121.000 EACH		.		.
0295	204.9060.S REMOVING (ITEM DESCRIPTION) 0001. CRASH BARRELS	2.000 EACH		.		.
0300	204.9060.S REMOVING (ITEM DESCRIPTION) 0002. APRON ENDWALL	1.000 EACH		.		.
0305	204.9090.S REMOVING (ITEM DESCRIPTION) 0001. NOISE BARRIER **P**	1,895.000 LF		.		.

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CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0310	204.9090.S REMOVING (ITEM DESCRIPTION) 0002. RETAINING WALL **P**	802.000 LF		.		.
0315	204.9090.S REMOVING (ITEM DESCRIPTION) 0003. DECORATIVE FENCE **P**	58.000 LF		.		.
0320	204.9090.S REMOVING (ITEM DESCRIPTION) 0005. DRAIN SLOTTED VANE **P**	917.000 LF		.		.
0325	205.0100 EXCAVATION COMMON **P**	938,979.000 CY		.		.
0330	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0001. B-40-537	LUMP	LUMP			.
0335	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0002. B-40-538	LUMP	LUMP			.
0340	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0003. B-40-789	LUMP	LUMP			.
0345	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0004. B-40-791	LUMP	LUMP			.
0350	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0005. B-40-798	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0355	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0006. B-40-849	LUMP	LUMP			.
0360	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0007. B-40-852	LUMP	LUMP			.
0365	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0009. B-40-857	LUMP	LUMP			.
0370	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0010. B-40-862	LUMP	LUMP			.
0375	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0011. B-40-863	LUMP	LUMP			.
0380	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0012. B-40-864	LUMP	LUMP			.
0385	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0013. B-40-866	LUMP	LUMP			.
0390	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0014. B-40-891	LUMP	LUMP			.

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CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0395	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0001. R-40-504	LUMP	LUMP			.
0400	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0002. R-40-546	LUMP	LUMP			.
0405	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0003. R-40-548	LUMP	LUMP			.
0410	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0004. R-40-554	LUMP	LUMP			.
0415	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0005. R-40-555	LUMP	LUMP			.
0420	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0006. R-40-560	LUMP	LUMP			.
0425	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0007. R-40-618	LUMP	LUMP			.
0430	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0008. R-40-619	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0435	206.3000 EXCAVATION FOR STRUCTURES RETAINING WALLS (STRUCTURE) 0009. R-40-620	LUMP	LUMP			.
0440	209.0100 BACKFILL GRANULAR	41,796.000 CY		.		.
0445	209.0200.S BACKFILL CONTROLLED LOW STRENGTH	617.000 CY		.		.
0450	210.0100 BACKFILL STRUCTURE **P**	8,443.000 CY		.		.
0455	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH **P**	284,379.000 TON		.		.
0460	312.0115 SELECT CRUSHED MATERIAL **P**	206,091.000 CY		.		.
0465	415.0075 CONCRETE PAVEMENT 7 1/2-INCH **P**	7,443.000 SY		.		.
0470	415.0080 CONCRETE PAVEMENT 8-INCH **P**	10,999.000 SY		.		.
0475	415.0085 CONCRETE PAVEMENT 8 1/2-INCH **P**	37,091.000 SY		.		.
0480	415.0090 CONCRETE PAVEMENT 9-INCH **P**	48,763.000 SY		.		.
0485	415.0095 CONCRETE PAVEMENT 9 1/2-INCH **P**	4,550.000 SY		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0490	415.0210 CONCRETE PAVEMENT GAPS	32.000 EACH		.		.
0495	415.0410 CONCRETE PAVEMENT APPROACH SLAB	2,712.000 SY		.		.
0500	415.1080 CONCRETE PAVEMENT HES 8-INCH	1,222.000 SY		.		.
0505	415.1085 CONCRETE PAVEMENT HES 8 1/2-INCH	42.000 SY		.		.
0510	415.1090 CONCRETE PAVEMENT HES 9-INCH	4,569.000 SY		.		.
0515	416.0170 CONCRETE DRIVEWAY 7-INCH **P**	1,721.000 SY		.		.
0520	416.0270 CONCRETE DRIVEWAY HES 7-INCH	666.000 SY		.		.
0525	416.0280 CONCRETE DRIVEWAY HES 8-INCH	138.000 SY		.		.
0530	416.0610 DRILLED TIE BARS	2,628.000 EACH		.		.
0535	416.0620 DRILLED DOWEL BARS	1,001.000 EACH		.		.
0540	416.1725 CONCRETE PAVEMENT REPLACEMENT SHES	80.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0545	440.4410.S INCENTIVE IRI RIDE	51,116.000 DOL	1.00000		51116.00	
0550	455.0115 ASPHALTIC MATERIAL PG64-22	361.000 TON	.		.	
0555	455.0120 ASPHALTIC MATERIAL PG64-28	1,842.000 TON	.		.	
0560	455.0150 ASPHALTIC MATERIAL PG70-28P	116.000 TON	.		.	
0565	455.0605 TACK COAT	3,716.000 GAL	.		.	
0570	460.1101 HMA PAVEMENT TYPE E-1	779.000 TON	.		.	
0575	460.1110 HMA PAVEMENT TYPE E-10	30,710.000 TON	.		.	
0580	460.1130 HMA PAVEMENT TYPE E-30	7,183.000 TON	.		.	
0585	460.2000 INCENTIVE DENSITY HMA PAVEMENT	24,198.000 DOL	1.00000		24198.00	
0590	465.0105 ASPHALTIC SURFACE	234.000 TON	.		.	
0595	465.0120 ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES	77.000 TON	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0600	465.0125 ASPHALTIC SURFACE TEMPORARY	13,602.000 TON		.		.
0605	465.0310 ASPHALTIC CURB	871.000 LF		.		.
0610	502.0100 CONCRETE MASONRY BRIDGES **P**	5,091.000 CY		.		.
0615	502.3100 EXPANSION DEVICE (STRUCTURE) 0001. B-40-852 **P**	LUMP	LUMP			.
0620	502.3200 PROTECTIVE SURFACE TREATMENT **P**	41,511.000 SY		.		.
0625	502.5005 MASONRY ANCHORS TYPE L NO. 5 BARS **P**	171.000 EACH		.		.
0630	503.0137 PRESTRESSED GIRDER TYPE I 36W-INCH **P**	560.000 LF		.		.
0635	503.0146 PRESTRESSED GIRDER TYPE I 45W-INCH **P**	10,222.000 LF		.		.
0640	503.0155 PRESTRESSED GIRDER TYPE I 54W-INCH **P**	13,586.000 LF		.		.
0645	504.0500 CONCRETE MASONRY RETAINING WALLS **P**	13,509.000 CY		.		.
0650	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	362,776.000 LB		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0655	505.0415 BAR STEEL REINFORCEMENT HS RETAINING WALLS	47,270.000 LB		.		.
0660	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	2,235,745 LB		.		.
0665	505.0615 BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	1,459,783 LB		.		.
0670	506.0605 STRUCTURAL STEEL HS **P**	7,299,667 LB		.		.
0675	506.2605 BEARING PADS ELASTOMERIC NON-LAMINATED **P**	406.000 EACH		.		.
0680	506.3010 WELDED STUD SHEAR CONNECTORS 7/8X5-INCH **P**	19,895.000 EACH		.		.
0685	506.3015 WELDED STUD SHEAR CONNECTORS 7/8X6-INCH **P**	20,343.000 EACH		.		.
0690	506.3020 WELDED STUD SHEAR CONNECTORS 7/8X7-INCH **P**	11,536.000 EACH		.		.
0695	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0001. B-40-537 **P**	18.000 EACH		.		.
0700	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0002. B-40-538 **P**	20.000 EACH		.		.
0705	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0003. B-40-789 **P**	18.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0710	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0004. B-40-791 **P**	44.000 EACH		.		.
0715	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0005. B-40-798 **P**	6.000 EACH		.		.
0720	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0006. B-40-849 **P**	6.000 EACH		.		.
0725	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0007. B-40-857 **P**	54.000 EACH		.		.
0730	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0008. B-40-862 **P**	75.000 EACH		.		.
0735	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0009. B-40-863 **P**	30.000 EACH		.		.
0740	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0010. B-40-864 **P**	34.000 EACH		.		.
0745	506.4000 STEEL DIAPHRAGMS (STRUCTURE) 0011. B-40-866 **P**	68.000 EACH		.		.
0750	511.1200 TEMPORARY SHORING (STRUCTURE) 0002. R-40-524	350.000 SF		.		.
0755	511.1200 TEMPORARY SHORING (STRUCTURE) 0003. R-40-551	990.000 SF		.		.
0760	511.1200 TEMPORARY SHORING (STRUCTURE) 0004. R-40-552	605.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0765	511.1300 TEMPORARY SHORING (LOCATION) 0001. 24FCB+78 TO 32FCB+19	2,060.000 SF		.		.
0770	511.1300 TEMPORARY SHORING (LOCATION) 0002. 41FCB+67 TO 45FCB+07	1,512.000 SF		.		.
0775	511.1300 TEMPORARY SHORING (LOCATION) 0003. 344NS+62 TO 346NS+00	3,640.000 SF		.		.
0780	511.1300 TEMPORARY SHORING (LOCATION) 0004. 595SW+59 TO 595SW+78	456.000 SF		.		.
0785	511.1300 TEMPORARY SHORING (LOCATION) 0005. 317NS+85 TO 318NS+20	910.000 SF		.		.
0790	511.1300 TEMPORARY SHORING (LOCATION) 0006. 321NS+38 TO 323NS+97	2,849.000 SF		.		.
0795	511.1300 TEMPORARY SHORING (LOCATION) 0007. 326NS+28 TO 327NS+14	2,088.000 SF		.		.
0800	511.1300 TEMPORARY SHORING (LOCATION) 0008. 269EW+98 TO 279EW+44	12,120.000 SF		.		.
0805	511.1300 TEMPORARY SHORING (LOCATION) 0009. 273EW+97 TO 279EW+25	7,332.000 SF		.		.
0810	511.1300 TEMPORARY SHORING (LOCATION) 0010. 313NS+33 TO 318NS+00	12,064.000 SF		.		.
0815	511.1300 TEMPORARY SHORING (LOCATION) 0011. 232EW+65 TO 233EW+15	1,600.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0820	511.1300 TEMPORARY SHORING (LOCATION) 0012. 233EW+76 TO 234EW+26	1,600.000 SF		.		.
0825	511.1300 TEMPORARY SHORING (LOCATION) 0013. 152EW+14 TO 152EW+71	1,026.000 SF		.		.
0830	511.1300 TEMPORARY SHORING (LOCATION) 0014. 802BB+15 TO 802BB+36	273.000 SF		.		.
0835	511.1300 TEMPORARY SHORING (LOCATION) 0015. 802BB+16 TO 802BB+58	546.000 SF		.		.
0840	511.1300 TEMPORARY SHORING (LOCATION) 0016. 802BB+58 TO 803BB+00	546.000 SF		.		.
0845	511.1300 TEMPORARY SHORING (LOCATION) 0017. 802BB+80 TO 803BB+01	273.000 SF		.		.
0846	511.1300 TEMPORARY SHORING (LOCATION) 0018. 7FCV+83 TO 9FCV+53	1,405.000 SF		.		.
0847	511.1300 TEMPORARY SHORING (LOCATION) 0019. 9FCV+21 TO 10FCV+76	1,210.000 SF		.		.
0850	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0002. B-40-789	203.000 SF		.		.
0855	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0003. R-40-525	1,039.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0860	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0004. R-40-536	2,061.000 SF		.		.
0865	512.0500 PILING STEEL SHEET PERMANENT DELIVERED	10,826.000 SF		.		.
0870	512.0600 PILING STEEL SHEET PERMANENT DRIVEN	10,826.000 SF		.		.
0875	513.2000 RAILING PIPE (STRUCTURE) 0001. B-40-798	LUMP	LUMP			.
0880	513.2000 RAILING PIPE (STRUCTURE) 0002. B-40-864	LUMP	LUMP			.
0885	513.2000 RAILING PIPE (STRUCTURE) 0003. R-40-504	LUMP	LUMP			.
0890	513.2000 RAILING PIPE (STRUCTURE) 0004. R-40-524	LUMP	LUMP			.
0895	513.2000 RAILING PIPE (STRUCTURE) 0005. R-40-525	LUMP	LUMP			.
0900	513.2000 RAILING PIPE (STRUCTURE) 0006. R-40-546	LUMP	LUMP			.
0905	513.2000 RAILING PIPE (STRUCTURE) 0007. R-40-548	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0910	513.2000 RAILING PIPE (STRUCTURE) 0008. R-40-554	LUMP	LUMP			.
0915	513.2000 RAILING PIPE (STRUCTURE) 0009. R-40-555	LUMP	LUMP			.
0920	513.2000 RAILING PIPE (STRUCTURE) 0010. R-40-556	LUMP	LUMP			.
0925	513.2000 RAILING PIPE (STRUCTURE) 0011. R-40-557	LUMP	LUMP			.
0930	513.2000 RAILING PIPE (STRUCTURE) 0013. R-40-560	LUMP	LUMP			.
0935	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0001. R-40-618	LUMP	LUMP			.
0940	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0002. R-40-619	LUMP	LUMP			.
0945	513.4080 RAILING TUBULAR SPECIAL (STRUCTURE) 0003. R-40-620	LUMP	LUMP			.
0950	514.0445 FLOOR DRAINS TYPE GC	1.000 EACH		.		.
0955	514.0450 FLOOR DRAINS TYPE WF	4.000 EACH		.		.
0960	514.2608 DOWNSPOUT 8-INCH **P**	566.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0965	514.2625 DOWNSPOUT 6-INCH **P**	50.000 LF		.		.
0970	516.0100 DAMPPROOFING **P**	6,358.000 SY		.		.
0975	516.0500 RUBBERIZED MEMBRANE WATERPROOFING **P**	2,418.000 SY		.		.
0980	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0001. B-40-852	LUMP	LUMP			.
0985	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0002. B-40-891	LUMP	LUMP			.
0990	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0003. R-40-546	LUMP	LUMP			.
0995	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0004. R-40-548	LUMP	LUMP			.
1000	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0005. R-40-554	LUMP	LUMP			.
1005	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0006. R-40-555	LUMP	LUMP			.
1010	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0007. R-40-560	LUMP	LUMP			.
1015	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0008. R-40-618	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1020	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0009. R-40-619	LUMP	LUMP			.
1025	517.0600 PAINTING EPOXY SYSTEM (STRUCTURE) 0010. R-40-620	LUMP	LUMP			.
1030	517.1010.S CONCRETE STAINING (STRUCTURE) 0001. B-40-785 **P**	12,742.000 SF		.		.
1035	517.1010.S CONCRETE STAINING (STRUCTURE) 0002. R-40-554 **P**	15,998.000 SF		.		.
1040	517.1010.S CONCRETE STAINING (STRUCTURE) 0003. R-40-555 **P**	25,452.000 SF		.		.
1045	517.1010.S CONCRETE STAINING (STRUCTURE) 0004. R-40-560 **P**	10,480.000 SF		.		.
1050	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0001. R-40-501 **P**	889.000 SF		.		.
1055	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0002. R-40-504 **P**	20,783.000 SF		.		.
1060	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0003. R-40-511 **P**	37,391.000 SF		.		.
1065	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0004. R-40-514 **P**	8,550.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1070	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0005. R-40-522 **P**	1,875.000 SF		.		.
1075	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0006. R-40-523 **P**	560.000 SF		.		.
1080	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0007. R-40-524 **P**	3,500.000 SF		.		.
1085	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0008. R-40-525 **P**	26,046.000 SF		.		.
1090	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0009. R-40-536 **P**	17,126.000 SF		.		.
1095	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0010. R-40-546 **P**	35,235.000 SF		.		.
1100	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0011. R-40-548 **P**	32,035.000 SF		.		.
1105	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0012. R-40-551 **P**	12,260.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1110	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0013. R-40-552 **P**	26,485.000 SF		.		.
1115	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0014. R-40-554 **P**	3,569.000 SF		.		.
1120	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0015. R-40-555 **P**	2,089.000 SF		.		.
1125	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0016. R-40-556 **P**	17,035.000 SF		.		.
1130	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0017. R-40-557 **P**	15,815.000 SF		.		.
1135	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0018. R-40-560 **P**	9,690.000 SF		.		.
1140	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0019. R-40-618 **P**	809.000 SF		.		.
1145	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0020. R-40-619 **P**	1,061.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1150	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0021. R-40-620 **P**	1,304.000 SF		.		.
1155	517.1050.S ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 0022. MINOR RETAINING WALL R-1 **P**	1,150.000 SF		.		.
1160	520.8000 CONCRETE COLLARS FOR PIPE	130.000 EACH		.		.
1165	522.1012 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 12-INCH	4.000 EACH		.		.
1170	522.1015 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 15-INCH	1.000 EACH		.		.
1175	522.1018 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 18-INCH	3.000 EACH		.		.
1180	522.1024 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 24-INCH	6.000 EACH		.		.
1185	522.1036 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 36-INCH	2.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1190	523.0558 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL 58X91-INCH	1.000 EACH		.		.
1195	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0001. N-40-62 **P**	13,870.000 SF		.		.
1200	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0002. N-40-68 **P**	20,600.000 SF		.		.
1205	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0003. N-40-69 **P**	58,270.000 SF		.		.
1210	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0004. N-40-70 **P**	9,670.000 SF		.		.
1215	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0005. N-40-71 **P**	15,170.000 SF		.		.
1220	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0006. N-40-72 **P**	19,220.000 SF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1225	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0007. N-40-73 **P**	17,090.000 SF		.		.
1230	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0008. N-40-74 **P**	6,600.000 SF		.		.
1235	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0009. N-40-75 **P**	14,250.000 SF		.		.
1240	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0010. N-40-80 **P**	14,930.000 SF		.		.
1245	531.0300.S NOISE BARRIERS DOUBLE-SIDED SOUND ABSORPTIVE (STRUCTURE) 0011. N-40-81 **P**	11,080.000 SF		.		.
1250	550.0010 PRE-BORING UNCONSOLIDATED MATERIALS	25.000 LF		.		.
1255	550.0500 PILE POINTS	482.000 EACH		.		.
1260	550.1100 PILING STEEL HP 10-INCH X 42 LB	2,340.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	CTS	BID AMOUNT DOLLARS	CTS
1265	550.1120 PILING STEEL HP 12-INCH X 53 LB	17,175.000	LF	.		.	
1270	550.1140 PILING STEEL HP 14-INCH X 73 LB	8,645.000	LF	.		.	
1275	550.2146 PILING CIP CONCRETE 14 X 0.375-INCH	12,259.000	LF	.		.	
1280	550.2148 PILING CIP CONCRETE 14 X 0.50-INCH	4,559.000	LF	.		.	
1285	550.2168 PILING CIP CONCRETE 16 X 0.50-INCH	1,875.000	LF	.		.	
1290	601.0319 CONCRETE CURB & GUTTER 19-INCH **P**	1,072.000	LF	.		.	
1295	601.0331 CONCRETE CURB & GUTTER 31-INCH **P**	28,199.000	LF	.		.	
1300	601.0551 CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE A **P**	1,798.000	LF	.		.	
1305	601.0600 CONCRETE CURB PEDESTRIAN **P**	878.000	LF	.		.	
1310	602.0410 CONCRETE SIDEWALK 5-INCH **P**	96,243.000	SF	.		.	
1315	602.0515 CURB RAMP DETECTABLE WARNING FIELD NATURAL PATINA	1,112.000	SF	.		.	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1320	602.1500 CONCRETE STEPS	209.000 SF		.		.
1325	603.1132 CONCRETE BARRIER TYPE S32	2,820.000 LF		.		.
1330	603.1142 CONCRETE BARRIER TYPE S42	39,927.000 LF		.		.
1335	603.1156 CONCRETE BARRIER TYPE S56	2,356.000 LF		.		.
1340	603.1332 CONCRETE BARRIER TYPE S32B	32.000 LF		.		.
1345	603.1342 CONCRETE BARRIER TYPE S42B	88.000 LF		.		.
1350	603.1436 CONCRETE BARRIER TYPE S36C	222.000 LF		.		.
1355	603.1442 CONCRETE BARRIER TYPE S42C	504.000 LF		.		.
1360	603.3111 CONCRETE BARRIER TRANSITION TYPE NJ32SF TO S32	1.000 EACH		.		.
1365	603.3211 CONCRETE BARRIER TRANSITION TYPE F32SF TO S32	11.000 EACH		.		.
1370	603.3513 CONCRETE BARRIER TRANSITION TYPE S32 TO S36	14.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1375	603.3535 CONCRETE BARRIER TRANSITION TYPE S36 TO S42	7.000 EACH		.		.
1380	603.3559 CONCRETE BARRIER TRANSITION TYPE S42 TO S56	9.000 EACH		.		.
1385	603.8000 CONCRETE BARRIER TEMPORARY PRECAST DELIVERED	77,323.000 LF		.		.
1390	603.8125 CONCRETE BARRIER TEMPORARY PRECAST INSTALLED	140,260.000 LF		.		.
1395	604.0400 SLOPE PAVING CONCRETE **P**	414.000 SY		.		.
1400	604.0500 SLOPE PAVING CRUSHED AGGREGATE **P**	1,602.000 SY		.		.
1405	606.0200 RIPRAP MEDIUM	267.000 CY		.		.
1410	607.0600.S STORM SEWER PIPE (INCH) 0001. 10-INCH	11.000 LF		.		.
1415	608.0312 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 12-INCH	2,301.000 LF		.		.
1420	608.0315 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 15-INCH	2,768.000 LF		.		.
1425	608.0318 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 18-INCH	4,915.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1430	608.0324 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 24-INCH	21,214.000 LF		.		.
1435	608.0330 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 30-INCH	1,843.000 LF		.		.
1440	608.0336 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 36-INCH	1,112.000 LF		.		.
1445	608.0342 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 42-INCH	173.000 LF		.		.
1450	608.0348 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 48-INCH	2,250.000 LF		.		.
1455	608.0354 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 54-INCH	1,532.000 LF		.		.
1460	608.0360 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 60-INCH	1,275.000 LF		.		.
1465	608.0366 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 66-INCH	990.000 LF		.		.
1470	608.0372 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 72-INCH	1,902.000 LF		.		.
1475	608.0396 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 96-INCH	16.000 LF		.		.
1480	608.0412 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 12-INCH	654.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1485	608.0415 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 15-INCH	378.000 LF		.		.
1490	608.0418 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 18-INCH	456.000 LF		.		.
1495	608.0424 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 24-INCH	2,947.000 LF		.		.
1500	608.0430 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 30-INCH	1,089.000 LF		.		.
1505	608.0436 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 36-INCH	475.000 LF		.		.
1510	608.0448 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 48-INCH	2,175.000 LF		.		.
1515	608.0454 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 54-INCH	655.000 LF		.		.
1520	608.0466 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 66-INCH	426.000 LF		.		.
1525	608.0472 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 72-INCH	101.000 LF		.		.
1530	608.0478 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 78-INCH	461.000 LF		.		.
1535	608.0515 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 15-INCH	19.000 LF		.		.

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1540	608.0518 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 18-INCH	144.000 LF		.		.
1545	608.0524 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 24-INCH	408.000 LF		.		.
1550	608.0530 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 30-INCH	35.000 LF		.		.
1555	608.0536 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 36-INCH	54.000 LF		.		.
1560	608.0572 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 72-INCH	287.000 LF		.		.
1565	610.0158 STORM SEWER PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III 58X91-INCH	594.000 LF		.		.
1570	611.0420 RECONSTRUCTING MANHOLES	6.000 EACH		.		.
1575	611.0430 RECONSTRUCTING INLETS	10.000 EACH		.		.
1580	611.0535 MANHOLE COVERS TYPE J-SPECIAL	102.000 EACH		.		.
1585	611.0600 INLET COVERS TYPE A	7.000 EACH		.		.

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1590	611.0606 INLET COVERS TYPE B	8.000 EACH		.		.
1595	611.0624 INLET COVERS TYPE H	167.000 EACH		.		.
1600	611.0627 INLET COVERS TYPE HM	9.000 EACH		.		.
1605	611.0642 INLET COVERS TYPE MS	85.000 EACH		.		.
1610	611.0654 INLET COVERS TYPE V	308.000 EACH		.		.
1615	611.0663 INLET COVERS TYPE X	40.000 EACH		.		.
1620	611.0666 INLET COVERS TYPE Z	3.000 EACH		.		.
1625	611.1004 CATCH BASINS 4-FT DIAMETER	64.000 EACH		.		.
1630	611.1005 CATCH BASINS 5-FT DIAMETER	6.000 EACH		.		.
1635	611.1006 CATCH BASINS 6-FT DIAMETER	3.000 EACH		.		.
1640	611.1230 CATCH BASINS 2X3-FT	26.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1645	611.2003 MANHOLES 3-FT DIAMETER	4.000 EACH		.		.
1650	611.2004 MANHOLES 4-FT DIAMETER	42.000 EACH		.		.
1655	611.2005 MANHOLES 5-FT DIAMETER	132.000 EACH		.		.
1660	611.2006 MANHOLES 6-FT DIAMETER	40.000 EACH		.		.
1665	611.2007 MANHOLES 7-FT DIAMETER	28.000 EACH		.		.
1670	611.2008 MANHOLES 8-FT DIAMETER	26.000 EACH		.		.
1675	611.3003 INLETS 3-FT DIAMETER	12.000 EACH		.		.
1680	611.3004 INLETS 4-FT DIAMETER	338.000 EACH		.		.
1685	611.3220 INLETS 2X2-FT	7.000 EACH		.		.
1690	611.3225 INLETS 2X2.5-FT	31.000 EACH		.		.
1695	611.3901 INLETS MEDIAN 1 GRATE	27.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1700	611.3902 INLETS MEDIAN 2 GRATE	29.000 EACH		.		.
1705	611.8110 ADJUSTING MANHOLE COVERS	32.000 EACH		.		.
1710	611.8115 ADJUSTING INLET COVERS	19.000 EACH		.		.
1715	611.8120.S COVER PLATES TEMPORARY	68.000 EACH		.		.
1720	611.9800.S PIPE GRATES	17.000 EACH		.		.
1725	612.0104 PIPE UNDERDRAIN 4-INCH	137.000 LF		.		.
1730	612.0106 PIPE UNDERDRAIN 6-INCH	1,211.000 LF		.		.
1735	612.0206 PIPE UNDERDRAIN UNPERFORATED 6-INCH	1,336.000 LF		.		.
1740	612.0406 PIPE UNDERDRAIN WRAPPED 6-INCH	12,883.000 LF		.		.
1745	612.0806 APRON ENDWALLS FOR UNDERDRAIN REINFORCED CONCRETE 6-INCH	4.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1750	612.0902.S INSULATION BOARD POLYSTYRENE (INCH) 0001. 4-INCH	35.000 SY		.		.
1755	614.0805 CRASH CUSHIONS PERMANENT LOW MAINTENANCE	11.000 EACH		.		.
1760	614.0905 CRASH CUSHIONS TEMPORARY	61.000 EACH		.		.
1765	614.2300 MGS GUARDRAIL 3	660.000 LF		.		.
1770	614.2500 MGS THRIE BEAM TRANSITION	234.000 LF		.		.
1775	614.2610 MGS GUARDRAIL TERMINAL EAT	7.000 EACH		.		.
1780	614.2620 MGS GUARDRAIL TERMINAL TYPE 2	1.000 EACH		.		.
1785	616.0206 FENCE CHAIN LINK 6-FT	10,116.000 LF		.		.
1790	616.0208 FENCE CHAIN LINK 8-FT	2,346.000 LF		.		.
1795	616.0329 GATES CHAIN LINK (WIDTH) 0001. 8-FT	1.000 EACH		.		.
1800	616.0329 GATES CHAIN LINK (WIDTH) 0002. 12-FT	3.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1805	616.0406 FENCE CHAIN LINK SALVAGED 6-FT	157.000 LF		.		.
1810	616.0700.S FENCE SAFETY	2,500.000 LF		.		.
1815	619.1000 MOBILIZATION	1.000 EACH		.		.
1820	620.0300 CONCRETE MEDIAN SLOPED NOSE **P**	1,512.000 SF		.		.
1825	623.0200 DUST CONTROL SURFACE TREATMENT	561,365.000 SY		.		.
1830	624.0100 WATER	4,534.000 MGAL		.		.
1835	628.1104 EROSION BALES	997.000 EACH		.		.
1840	628.1504 SILT FENCE	25,865.000 LF		.		.
1845	628.1520 SILT FENCE MAINTENANCE	25,865.000 LF		.		.
1850	628.1905 MOBILIZATIONS EROSION CONTROL	40.000 EACH		.		.
1855	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL	20.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1860	628.2004 EROSION MAT CLASS I TYPE B	313,004.000 SY		.		.
1865	628.2021 EROSION MAT CLASS II TYPE A	245.000 SY		.		.
1870	628.2023 EROSION MAT CLASS II TYPE B	135,048.000 SY		.		.
1875	628.6510 SOIL STABILIZER TYPE B	3.200 ACRE		.		.
1880	628.7005 INLET PROTECTION TYPE A	1,438.000 EACH		.		.
1885	628.7010 INLET PROTECTION TYPE B	418.000 EACH		.		.
1890	628.7015 INLET PROTECTION TYPE C	666.000 EACH		.		.
1895	628.7020 INLET PROTECTION TYPE D	1,678.000 EACH		.		.
1900	628.7504 TEMPORARY DITCH CHECKS	3,422.000 LF		.		.
1905	628.7555 CULVERT PIPE CHECKS	11.000 EACH		.		.
1910	628.7560 TRACKING PADS	33.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1915	628.7570 ROCK BAGS	250.000 EACH		.		.
1920	629.0210 FERTILIZER TYPE B	217.000 CWT		.		.
1925	630.0130 SEEDING MIXTURE NO. 30	4,003.000 LB		.		.
1930	630.0180 SEEDING MIXTURE NO. 80	769.000 LB		.		.
1935	630.0200 SEEDING TEMPORARY	4,445.000 LB		.		.
1940	630.0400 SEEDING NURSE CROP	898.000 LB		.		.
1945	631.0300 SOD WATER	413.700 MGAL		.		.
1950	631.1000 SOD LAWN	18,416.000 SY		.		.
2025	632.9101 LANDSCAPE PLANTING SURVEILLANCE AND CARE CYCLES	24.000 EACH		.		.
2030	633.0500 DELINEATOR REFLECTORS	424.000 EACH		.		.
2035	633.1000 DELINEATOR BRACKETS	424.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2040	633.5200 MARKERS CULVERT END	17.000 EACH		.		.
2045	634.0618 POSTS WOOD 4X6-INCH X 18-FT	144.000 EACH		.		.
2050	634.0620 POSTS WOOD 4X6-INCH X 20-FT	8.000 EACH		.		.
2055	634.0622 POSTS WOOD 4X6-INCH X 22-FT	62.000 EACH		.		.
2060	634.0816 POSTS TUBULAR STEEL 2X2-INCH X 16-FT	155.000 EACH		.		.
2065	634.0885 POSTS TUBULAR STEEL 2X2-INCH X 8.5-FT	88.000 EACH		.		.
2070	635.0200 SIGN SUPPORTS STRUCTURAL STEEL HS	11,200.000 LB		.		.
2075	635.0300 SIGN SUPPORTS REPLACING BASE CONNECTION BOLTS	2.000 EACH		.		.
2080	636.0100 SIGN SUPPORTS CONCRETE MASONRY **P**	1,341.700 CY		.		.
2085	636.0500 SIGN SUPPORTS STEEL REINFORCEMENT	1,206.000 LB		.		.
2090	636.1000 SIGN SUPPORTS STEEL REINFORCEMENT HS	115,325.000 LB		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2095	636.1500 SIGN SUPPORTS STEEL COATED REINFORCEMENT HS	189,375.000 LB		.		.
2100	637.1210 SIGNS TYPE I REFLECTIVE H	2,538.000 SF		.		.
2105	637.1220 SIGNS TYPE I REFLECTIVE SH	14,265.000 SF		.		.
2110	637.1230 SIGNS TYPE I REFLECTIVE F	202.500 SF		.		.
2115	637.2210 SIGNS TYPE II REFLECTIVE H	2,850.130 SF		.		.
2120	637.2215 SIGNS TYPE II REFLECTIVE H FOLDING	144.600 SF		.		.
2125	637.2230 SIGNS TYPE II REFLECTIVE F	1,060.000 SF		.		.
2130	638.2101 MOVING SIGNS TYPE I	4.000 EACH		.		.
2135	638.2102 MOVING SIGNS TYPE II	110.000 EACH		.		.
2140	638.2601 REMOVING SIGNS TYPE I	60.000 EACH		.		.
2145	638.2602 REMOVING SIGNS TYPE II	593.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2150	638.3000 REMOVING SMALL SIGN SUPPORTS	350.000 EACH		.		.
2155	638.3100 REMOVING STRUCTURAL STEEL SIGN SUPPORTS	55.000 EACH		.		.
2160	641.0100 SIGN BRIDGE SINGLE POLE SIGN SUPPORT ONE SIGN (STRUCTURE) 0001. S-40-788	LUMP	LUMP			.
2165	641.0100 SIGN BRIDGE SINGLE POLE SIGN SUPPORT ONE SIGN (STRUCTURE) 0002. S-40-789	LUMP	LUMP			.
2170	641.0600 SIGN BRIDGE SINGLE POLE SIGN SUPPORT TWO SIGNS (STRUCTURE) 0001. S-40-790	LUMP	LUMP			.
2175	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0001. S-40-28	LUMP	LUMP			.
2180	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0002. S-40-65	LUMP	LUMP			.
2185	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0003. S-40-85	LUMP	LUMP			.
2190	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0004. S-40-118	LUMP	LUMP			.
2195	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0005. S-40-119	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2200	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0006. S-40-124	LUMP	LUMP			.
2205	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0007. S-40-129	LUMP	LUMP			.
2210	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0008. S-40-130	LUMP	LUMP			.
2215	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0009. S-40-131	LUMP	LUMP			.
2220	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0010. S-40-134	LUMP	LUMP			.
2225	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0011. S-40-137	LUMP	LUMP			.
2230	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0012. S-40-146	LUMP	LUMP			.
2235	641.1200 SIGN BRIDGE CANTILEVERED (STRUCTURE) 0013. S-40-158	LUMP	LUMP			.
2240	641.6600 SIGN BRIDGE (STRUCTURE) 0001. S-40-22	LUMP	LUMP			.
2245	641.6600 SIGN BRIDGE (STRUCTURE) 0002. S-40-27	LUMP	LUMP			.
2250	641.6600 SIGN BRIDGE (STRUCTURE) 0003. S-40-43	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2255	641.6600 SIGN BRIDGE (STRUCTURE) 0004. S-40-44	LUMP	LUMP			.
2260	641.6600 SIGN BRIDGE (STRUCTURE) 0005. S-40-47	LUMP	LUMP			.
2265	641.6600 SIGN BRIDGE (STRUCTURE) 0006. S-40-50	LUMP	LUMP			.
2270	641.6600 SIGN BRIDGE (STRUCTURE) 0007. S-40-51	LUMP	LUMP			.
2275	641.6600 SIGN BRIDGE (STRUCTURE) 0008. S-40-87	LUMP	LUMP			.
2280	641.6600 SIGN BRIDGE (STRUCTURE) 0009. S-40-104	LUMP	LUMP			.
2285	641.6600 SIGN BRIDGE (STRUCTURE) 0010. S-40-116	LUMP	LUMP			.
2290	641.6600 SIGN BRIDGE (STRUCTURE) 0011. S-40-117	LUMP	LUMP			.
2295	641.6600 SIGN BRIDGE (STRUCTURE) 0012. S-40-121	LUMP	LUMP			.
2300	641.6600 SIGN BRIDGE (STRUCTURE) 0013. S-40-122	LUMP	LUMP			.
2305	641.6600 SIGN BRIDGE (STRUCTURE) 0014. S-40-132	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2310	641.6600 SIGN BRIDGE (STRUCTURE) 0015. S-40-135	LUMP	LUMP			.
2315	641.6600 SIGN BRIDGE (STRUCTURE) 0016. S-40-136	LUMP	LUMP			.
2320	641.6600 SIGN BRIDGE (STRUCTURE) 0017. S-40-443	LUMP	LUMP			.
2325	641.6600 SIGN BRIDGE (STRUCTURE) 0018. S-40-444	LUMP	LUMP			.
2330	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0001. S-40-991	LUMP	LUMP			.
2335	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0002. S-40-992	LUMP	LUMP			.
2340	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0003. S-40-993	LUMP	LUMP			.
2345	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0004. S-40-989	LUMP	LUMP			.
2350	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0005. S-40-147	LUMP	LUMP			.
2355	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0006. S-40-148	LUMP	LUMP			.
2360	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0007. S-40-149	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2365	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0008. S-40-995	LUMP	LUMP			.
2370	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0009. S-40-996	LUMP	LUMP			.
2375	641.8100 OVERHEAD SIGN SUPPORT (STRUCTURE) 0010. S-40-971	LUMP	LUMP			.
2380	643.0200 TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE (PROJECT) 0001. 1060-33-80	636.000 DAY		.		.
2385	643.0300 TRAFFIC CONTROL DRUMS	480,499.000 DAY		.		.
2390	643.0410 TRAFFIC CONTROL BARRICADES TYPE II	6,814.000 DAY		.		.
2395	643.0420 TRAFFIC CONTROL BARRICADES TYPE III	65,009.000 DAY		.		.
2400	643.0500 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER POSTS	391.000 EACH		.		.
2405	643.0600 TRAFFIC CONTROL FLEXIBLE TUBULAR MARKER BASES	391.000 EACH		.		.
2410	643.0705 TRAFFIC CONTROL WARNING LIGHTS TYPE A	129,993.000 DAY		.		.
2415	643.0715 TRAFFIC CONTROL WARNING LIGHTS TYPE C	85,856.000 DAY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2420	643.0800 TRAFFIC CONTROL ARROW BOARDS	3,958.000 DAY		.		.
2425	643.0900 TRAFFIC CONTROL SIGNS	239,804.000 DAY		.		.
2430	643.0910 TRAFFIC CONTROL COVERING SIGNS TYPE I	92.000 EACH		.		.
2435	643.0920 TRAFFIC CONTROL COVERING SIGNS TYPE II	254.000 EACH		.		.
2440	643.1000 TRAFFIC CONTROL SIGNS FIXED MESSAGE	3,649.750 SF		.		.
2445	643.1050 TRAFFIC CONTROL SIGNS PCMS	5,139.000 DAY		.		.
2450	643.2000 TRAFFIC CONTROL DETOUR (PROJECT) 0001. 1060-33-80	1.000 EACH		.		.
2455	643.3000 TRAFFIC CONTROL DETOUR SIGNS	635,043.000 DAY		.		.
2460	645.0111 GEOTEXTILE FABRIC TYPE DF SCHEDULE A **P**	544.000 SY		.		.
2465	645.0112 GEOTEXTILE FABRIC TYPE DF SCHEDULE B **P**	1,332.000 SY		.		.
2470	645.0120 GEOTEXTILE FABRIC TYPE HR **P**	340.000 SY		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2475	645.0130 GEOTEXTILE FABRIC TYPE R **P**	3,439.000 SY		.		.
2480	645.0140 GEOTEXTILE FABRIC TYPE SAS **P**	15,615.000 SY		.		.
2485	646.0106 PAVEMENT MARKING EPOXY 4-INCH	249,280.000 LF		.		.
2490	646.0126 PAVEMENT MARKING EPOXY 8-INCH	20,133.000 LF		.		.
2495	646.0600 REMOVING PAVEMENT MARKINGS	97,838.000 LF		.		.
2500	646.0841.S PAVEMENT MARKING GROOVED WET REFLECTIVE CONTRAST TAPE 4-INCH **P**	13,131.000 LF		.		.
2505	646.0843.S PAVEMENT MARKING GROOVED WET REFLECTIVE CONTRAST TAPE 8-INCH **P**	16,747.000 LF		.		.
2510	646.0883.S PAVEMENT MARKING GROOVED WET REFLECTIVE TAPE 8-INCH **P**	824.000 LF		.		.
2515	647.0196 PAVEMENT MARKING ARROWS EPOXY TYPE 5	4.000 EACH		.		.
2520	647.0456 PAVEMENT MARKING CURB EPOXY	617.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	647.0566 PAVEMENT					
2525	MARKING STOP LINE EPOXY	200.000				
	18-INCH	LF		.		.
	647.0606 PAVEMENT					
2530	MARKING ISLAND NOSE	16.000				
	EPOXY	EACH		.		.
	647.0656 PAVEMENT					
2535	MARKING PARKING STALL	666.000				
	EPOXY	LF		.		.
	647.0726 PAVEMENT					
2540	MARKING DIAGONAL EPOXY	3,688.000				
	12-INCH	LF		.		.
	647.0746 PAVEMENT					
2545	MARKING DIAGONAL EPOXY	3,416.000				
	24-INCH	LF		.		.
	647.0955 REMOVING					
2550	PAVEMENT MARKINGS ARROWS	6.000				
		EACH		.		.
	649.0100 TEMPORARY					
2555	PAVEMENT MARKING 4-INCH	14,400.000				
		LF		.		.
	649.0200 TEMPORARY					
2560	PAVEMENT MARKING	106,472.000				
	REFLECTIVE PAINT 4-INCH	LF				
				.		.
	649.0400 TEMPORARY					
2565	PAVEMENT MARKING	115,784.000				
	REMOVABLE TAPE 4-INCH	LF		.		.
	649.0701 TEMPORARY					
2570	PAVEMENT MARKING 8-INCH	2,581.000				
		LF		.		.

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2575	649.0801 TEMPORARY PAVEMENT MARKING REMOVABLE TAPE 8-INCH	17,588.000 LF		.		.
2580	649.2100 TEMPORARY RAISED PAVEMENT MARKERS	120.000 EACH		.		.
2585	652.0125 CONDUIT RIGID METALLIC 2-INCH	1,173.000 LF		.		.
2590	652.0130 CONDUIT RIGID METALLIC 2 1/2-INCH	12.000 LF		.		.
2595	652.0135 CONDUIT RIGID METALLIC 3-INCH	6.000 LF		.		.
2600	652.0210 CONDUIT RIGID NONMETALLIC SCHEDULE 40 1-INCH	266.000 LF		.		.
2605	652.0225 CONDUIT RIGID NONMETALLIC SCHEDULE 40 2-INCH	45,173.000 LF		.		.
2610	652.0230 CONDUIT RIGID NONMETALLIC SCHEDULE 40 2 1/2-INCH	928.000 LF		.		.
2615	652.0235 CONDUIT RIGID NONMETALLIC SCHEDULE 40 3-INCH	36,232.000 LF		.		.
2620	652.0325 CONDUIT RIGID NONMETALLIC SCHEDULE 80 2-INCH	8,926.000 LF		.		.
2625	652.0605 CONDUIT SPECIAL 2-INCH	5,678.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2630	652.0615 CONDUIT SPECIAL 3-INCH	1,065.000 LF		.		.
2635	652.0700.S INSTALL CONDUIT INTO EXISTING ITEM	17.000 EACH		.		.
2640	652.0800 CONDUIT LOOP DETECTOR	8,761.000 LF		.		.
2645	653.0105 PULL BOXES STEEL 12X24-INCH	12.000 EACH		.		.
2650	653.0135 PULL BOXES STEEL 24X36-INCH	68.000 EACH		.		.
2655	653.0140 PULL BOXES STEEL 24X42-INCH	144.000 EACH		.		.
2660	653.0220 JUNCTION BOXES 18X6X6-INCH	16.000 EACH		.		.
2665	653.0222 JUNCTION BOXES 18X12X6-INCH	63.000 EACH		.		.
2670	653.0905 REMOVING PULL BOXES	116.000 EACH		.		.
2675	654.0101 CONCRETE BASES TYPE 1	41.000 EACH		.		.
2680	654.0102 CONCRETE BASES TYPE 2	5.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2685	654.0105 CONCRETE BASES TYPE 5	118.000 EACH		.		.
2690	654.0110 CONCRETE BASES TYPE 10	8.000 EACH		.		.
2695	654.0113 CONCRETE BASES TYPE 13	8.000 EACH		.		.
2700	654.0217 CONCRETE CONTROL CABINET BASES TYPE 9 SPECIAL	3.000 EACH		.		.
2705	655.0230 CABLE TRAFFIC SIGNAL 5-14 AWG	4,341.000 LF		.		.
2710	655.0240 CABLE TRAFFIC SIGNAL 7-14 AWG	7,126.000 LF		.		.
2715	655.0250 CABLE TRAFFIC SIGNAL 9-14 AWG	310.000 LF		.		.
2720	655.0255 CABLE TRAFFIC SIGNAL 12-12 AWG	5,354.000 LF		.		.
2725	655.0260 CABLE TRAFFIC SIGNAL 12-14 AWG	5,237.000 LF		.		.
2730	655.0270 CABLE TRAFFIC SIGNAL 15-14 AWG	514.000 LF		.		.
2735	655.0305 CABLE TYPE UF 2-12 AWG GROUNDED	3,360.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2740	655.0320 CABLE TYPE UF 2-10 AWG GROUNDED	2,992.000 LF		.		.
2745	655.0505 ELECTRICAL WIRE TRAFFIC SIGNALS 14 AWG	19,670.000 LF		.		.
2750	655.0515 ELECTRICAL WIRE TRAFFIC SIGNALS 10 AWG	10,632.000 LF		.		.
2755	655.0610 ELECTRICAL WIRE LIGHTING 12 AWG	31,519.000 LF		.		.
2760	655.0615 ELECTRICAL WIRE LIGHTING 10 AWG	954.000 LF		.		.
2765	655.0620 ELECTRICAL WIRE LIGHTING 8 AWG	55,195.000 LF		.		.
2770	655.0625 ELECTRICAL WIRE LIGHTING 6 AWG	143,564.000 LF		.		.
2775	655.0630 ELECTRICAL WIRE LIGHTING 4 AWG	10,616.000 LF		.		.
2780	655.0635 ELECTRICAL WIRE LIGHTING 2 AWG	11,002.000 LF		.		.
2785	655.0640 ELECTRICAL WIRE LIGHTING 1 AWG	210.000 LF		.		.
2790	655.0645 ELECTRICAL WIRE LIGHTING 1/0 AWG	1,962.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2795	655.0700 LOOP DETECTOR LEAD IN CABLE	34,500.000 LF		.		.
2800	655.0800 LOOP DETECTOR WIRE	28,120.000 LF		.		.
2805	655.0900 TRAFFIC SIGNAL EVP DETECTOR CABLE	6,020.000 LF		.		.
2810	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 1100. ATR214EW AND ATR215EW	LUMP	LUMP			.
2815	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2001. CB-SDS-40-0051	LUMP	LUMP			.
2820	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2002. CB-SDS-40-0227	LUMP	LUMP			.
2825	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2003. CB-RM-40-0010	LUMP	LUMP			.
2830	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2004. CB-SDS-40-0228	LUMP	LUMP			.
2835	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 2005. CB-RM-40-0009	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2840	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 3001. IH 94 RAMPS & STH 181	LUMP	LUMP			.
2845	656.0200 ELECTRICAL SERVICE METER BREAKER PEDESTAL (LOCATION) 3002. USH 45 RAMPS & USH 18	LUMP	LUMP			.
2850	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0001. (HL-40-UN)	LUMP	LUMP			.
2855	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0002. (WASHINGTON - WT)	LUMP	LUMP			.
2860	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0003. (HL-40-WB)	LUMP	LUMP			.
2865	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0004. (HL-40-AD)	LUMP	LUMP			.
2870	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0005. (HL-40-DX)	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2875	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0006. (HL-40-ZE/QR)	LUMP	LUMP			.
2880	656.0400 ELECTRICAL SERVICE MAIN LUGS ONLY METER PEDESTAL (LOCATION) 0007. (HL-40-TA)	LUMP	LUMP			.
2885	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2001. CB-CCTV-40-0099	LUMP	LUMP			.
2890	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2002. CB-SDS-40-0051	LUMP	LUMP			.
2895	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2003. CB-SDS-40-0227	LUMP	LUMP			.
2900	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2004. CB-RM-40-0010	LUMP	LUMP			.
2905	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2005. CB-CCTV-40-0141	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2910	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2006. CB-SDS-40-0228	LUMP	LUMP			.
2915	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2007. CB-RM-40-0009	LUMP	LUMP			.
2920	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2008. CB-DMS-40-0132	LUMP	LUMP			.
2925	656.0500 ELECTRICAL SERVICE BREAKER DISCONNECT BOX (LOCATION) 2009. CB-DMS-40-0019	LUMP	LUMP			.
2930	657.0100 PEDESTAL BASES	31.000 EACH		.		.
2935	657.0210 TRANSFORMER BASES BREAKAWAY 15-17 INCH BOLT CIRCLE	16.000 EACH		.		.
2940	657.0255 TRANSFORMER BASES BREAKAWAY 11 1/2-INCH BOLT CIRCLE	115.000 EACH		.		.
2945	657.0305 POLES TYPE 2	3.000 EACH		.		.
2950	657.0310 POLES TYPE 3	2.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2955	657.0322 POLES TYPE 5-ALUMINUM	143.000 EACH		.		.
2960	657.0375 POLES TYPE A	16.000 EACH		.		.
2965	657.0405 TRAFFIC SIGNAL STANDARDS ALUMINUM 3.5-FT	6.000 EACH		.		.
2970	657.0420 TRAFFIC SIGNAL STANDARDS ALUMINUM 13-FT	13.000 EACH		.		.
2975	657.0425 TRAFFIC SIGNAL STANDARDS ALUMINUM 15-FT	5.000 EACH		.		.
2980	657.0430 TRAFFIC SIGNAL STANDARDS ALUMINUM 10-FT	9.000 EACH		.		.
2985	657.0605 LUMINAIRE ARMS SINGLE MEMBER 4 1/2-INCH CLAMP 4-FT	28.000 EACH		.		.
2990	657.0609 LUMINAIRE ARMS SINGLE MEMBER 4-INCH CLAMP 6-FT	2.000 EACH		.		.
2995	657.0610 LUMINAIRE ARMS SINGLE MEMBER 4 1/2-INCH CLAMP 6-FT	145.000 EACH		.		.
3000	657.0620 LUMINAIRE ARMS SINGLE MEMBER 6-INCH CLAMP 4-FT	34.000 EACH		.		.
3005	657.1345 INSTALL POLES TYPE 9	5.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3010	657.1350 INSTALL POLES TYPE 10	3.000 EACH		.		.
3015	657.1355 INSTALL POLES TYPE 12	8.000 EACH		.		.
3020	657.1515 INSTALL MONOTUBE ARMS 15-FT	1.000 EACH		.		.
3025	657.1520 INSTALL MONOTUBE ARMS 20-FT	2.000 EACH		.		.
3030	657.1530 INSTALL MONOTUBE ARMS 30-FT	5.000 EACH		.		.
3035	657.1535 INSTALL MONOTUBE ARMS 35-FT	3.000 EACH		.		.
3040	657.1540 INSTALL MONOTUBE ARMS 40-FT	1.000 EACH		.		.
3045	657.1545 INSTALL MONOTUBE ARMS 45-FT	1.000 EACH		.		.
3050	657.1550 INSTALL MONOTUBE ARMS 50-FT	2.000 EACH		.		.
3055	657.1555 INSTALL MONOTUBE ARMS 55-FT	1.000 EACH		.		.
3060	657.1808 INSTALL LUMINAIRE ARMS STEEL 8-FT	3.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3065	657.6005.S ANCHOR ASSEMBLIES LIGHT POLES ON STRUCTURES	43.000 EACH		.		.
3070	658.0110 TRAFFIC SIGNAL FACE 3-12 INCH VERTICAL	64.000 EACH		.		.
3075	658.0115 TRAFFIC SIGNAL FACE 4-12 INCH VERTICAL	9.000 EACH		.		.
3080	658.0215 BACKPLATES SIGNAL FACE 3 SECTION 12-INCH	64.000 EACH		.		.
3085	658.0220 BACKPLATES SIGNAL FACE 4 SECTION 12-INCH	9.000 EACH		.		.
3090	658.0416 PEDESTRIAN SIGNAL FACE 16-INCH	32.000 EACH		.		.
3095	658.0500 PEDESTRIAN PUSH BUTTONS	40.000 EACH		.		.
3100	658.0600 LED MODULES 12-INCH RED BALL	56.000 EACH		.		.
3105	658.0605 LED MODULES 12-INCH YELLOW BALL	54.000 EACH		.		.
3110	658.0610 LED MODULES 12-INCH GREEN BALL	48.000 EACH		.		.
3115	658.0615 LED MODULES 12-INCH RED ARROW	17.000 EACH		.		.

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3120	658.0620 LED MODULES 12-INCH YELLOW ARROW	25.000 EACH		.		.
3125	658.0625 LED MODULES 12-INCH GREEN ARROW	28.000 EACH		.		.
3130	658.0635 LED MODULES PEDESTRIAN COUNTDOWN TIMER 16-INCH	32.000 EACH		.		.
3135	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3001. IH 94 RAMPS & STH 181	LUMP	LUMP			.
3140	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3002. USH 45 RAMPS & USH 18	LUMP	LUMP			.
3145	658.5069 SIGNAL MOUNTING HARDWARE (LOCATION) 3003. USH 18 & N. 95TH STREET	LUMP	LUMP			.
3150	659.0802 PLAQUES SEQUENCE IDENTIFICATION	251.000 EACH		.		.
3155	659.1120 LUMINAIRES UTILITY LED B	156.000 EACH		.		.
3160	659.1130 LUMINAIRES UTILITY LED D	76.000 EACH		.		.
3165	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3001. IH 94 EB RAMPS & STH 181	LUMP	LUMP			.

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3170	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3002. IH 94 WB RAMPS & STH 181	LUMP	LUMP			.
3171	661.0200 TEMPORARY TRAFFIC SIGNALS FOR INTERSECTIONS (LOCATION) 3003. IH 94 WB RAMPS & STH 181	LUMP	LUMP			.
3175	661.0300 GENERATORS	6.000 DAY		.		.
3180	662.1028.S RAMP CLOSURE GATES HARDWIRED 28-FT	1.000 EACH		.		.
3185	662.1037.S RAMP CLOSURE GATES HARDWIRED 37-FT	2.000 EACH		.		.
3190	662.1040.S RAMP CLOSURE GATES HARDWIRED 40-FT	1.000 EACH		.		.
3195	670.0100 FIELD SYSTEM INTEGRATOR 2001. FTMS	LUMP	LUMP			.
3200	670.0100 FIELD SYSTEM INTEGRATOR 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3205	670.0100 FIELD SYSTEM INTEGRATOR 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3210	670.0200 ITS DOCUMENTATION 2001. FTMS	LUMP	LUMP			.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3215	670.0200 ITS DOCUMENTATION 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3220	670.0200 ITS DOCUMENTATION 3002. USH 18 CORRIDOR	LUMP	LUMP			.
3225	671.0132 CONDUIT HDPE 3-DUCT 2-INCH	4,125.000 LF		.		.
3230	672.0100 BASE ITS CONTROLLER CABINET	3.000 EACH		.		.
3235	672.0250 BASE CAMERA POLE 50-FT	3.000 EACH		.		.
3240	672.0280 BASE CAMERA POLE 80-FT	1.000 EACH		.		.
3245	673.0105 COMMUNICATION VAULT TYPE 1	20.000 EACH		.		.
3250	673.0200.S INSTALL ITS FIELD CABINET	3.000 EACH		.		.
3255	673.0225.S INSTALL POLE MOUNTED CABINET	8.000 EACH		.		.
3260	674.0112 CABLE ITS COMMUNICATION 12 PAIR	874.000 LF		.		.
3265	674.0125 CABLE ITS COMMUNICATION 25 PAIR	1,249.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3270	674.0200 CABLE MICROWAVE DETECTOR	9,340.000 LF		.		.
3275	674.0300 REMOVE CABLE	38,930.000 LF		.		.
3280	675.0100 INSTALL CONTROLLER RAMP METER PROCESSOR ASSEMBLY	3.000 EACH		.		.
3285	675.0300 INSTALL MOUNTED CONTROLLER MICROWAVE DETECTOR ASSEMBLY	17.000 EACH		.		.
3290	675.0400.S INSTALL ETHERNET SWITCH	8.000 EACH		.		.
3295	676.0100 SIGNAL ASSEMBLY RAMP CONTROL SIDEMOUNT	5.000 EACH		.		.
3300	676.0105 SIGNAL ASSEMBLY RAMP CONTROL OVERHEAD	2.000 EACH		.		.
3305	676.0300 SIGNAL ASSEMBLY ADVANCE FLASHER TYPE 1	6.000 EACH		.		.
3310	676.9001.S REMOVING ADVANCE FLASHER ASSEMBLIES TYPE 1	7.000 EACH		.		.
3315	677.0100 INSTALL CAMERA POLE	3.000 EACH		.		.
3320	677.0200 INSTALL CAMERA ASSEMBLY	4.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3325	677.0300.S INSTALL VIDEO ENCODER	4.000 EACH		.		.
3330	677.9051.S REMOVING 50-FOOT CAMERA POLE	3.000 EACH		.		.
3335	677.9200.S REMOVING CCTV CAMERA	3.000 EACH		.		.
3340	678.0006 INSTALL FIBER OPTIC CABLE OUTDOOR PLANT 6-CT	11,775.000 LF		.		.
3345	678.0072 INSTALL FIBER OPTIC CABLE OUTDOOR PLANT 72-CT	10,720.000 LF		.		.
3350	678.0100.S INSTALL OVERHEAD FREEWAY DMS FULL MATRIX	2.000 EACH		.		.
3355	678.0300 FIBER OPTIC SPLICE	423.000 EACH		.		.
3360	678.0400 FIBER OPTIC TERMINATION	76.000 EACH		.		.
3365	678.0500 COMMUNICATION SYSTEM TESTING 2001. FTMS	LUMP	LUMP			.
3370	678.0500 COMMUNICATION SYSTEM TESTING 3001. STH 181 CORRIDOR	LUMP	LUMP			.
3375	678.0500 COMMUNICATION SYSTEM TESTING 3002. USH 18 CORRIDOR	LUMP	LUMP			.

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3380	690.0150 SAWING ASPHALT	5,307.000 LF	.		.	
3385	690.0250 SAWING CONCRETE	47,431.000 LF	.		.	
3390	715.0415 INCENTIVE STRENGTH CONCRETE PAVEMENT	102,710.000 DOL	1.00000		102710.00	
3395	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	182,144.000 DOL	1.00000		182144.00	
3400	ASP.1T0A ON-THE-JOB TRAINING APPRENTICE AT $5.00/HR	22,500.000 HRS	5.00000		112500.00	
3405	ASP.1T0G ON-THE-JOB TRAINING GRADUATE AT $5.00/HR	22,500.000 HRS	5.00000		112500.00	
3410	SPV.0035 SPECIAL 0100. EBS EXCAVATION	46,652.000 CY	.		.	
3415	SPV.0035 SPECIAL 0101. EBS BACKFILL	46,413.000 CY	.		.	
3420	SPV.0035 SPECIAL 0700. EXCAVATION, HAULING, AND REUSE OF SOLID WASTE SOIL	16,574.000 CY	.		.	
3425	SPV.0035 SPECIAL 4000. HPC MASONRY STRUCTURES **P**	11,677.500 CY	.		.	

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3430	SPV.0035 SPECIAL 4010. CONCRETE MASONRY SOLDIER PILE FOOTINGS **P**	2,705.000 CY		.		.
3435	SPV.0035 SPECIAL 4020. LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 1	12,896.000 CY		.		.
3440	SPV.0035 SPECIAL 4030. LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 2	4,034.000 CY		.		.
3445	SPV.0045 SPECIAL 0100. TEMPORARY CROSSWALK/SIDEWALK	600.000 DAY		.		.
3450	SPV.0045 SPECIAL 0400. TRUCK OR TRAILER MOUNTED ATTENUATOR	500.000 DAY		.		.
3455	SPV.0045 SPECIAL 0401. PORTABLE SPEED TRAILER	1,926.000 DAY		.		.
3460	SPV.0045 SPECIAL 2000. DYNAMIC LATE MERGE SYSTEM	465.000 DAY		.		.
3465	SPV.0045 SPECIAL 2001. WORK ZONE CONSTRUCTION TRAFFIC MERGE WARNING SYSTEM	932.000 DAY		.		.
3470	SPV.0060 SPECIAL 0003. EXPOSING EXISTING UTILITY UNPAVED AREA	150.000 EACH		.		.
3475	SPV.0060 SPECIAL 0004. EXPOSING EXISTING UTILITY PAVED AREA	150.000 EACH		.		.

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3480	SPV.0060 SPECIAL 0005. BASELINE CPM PROGRESS SCHEDULE	1.000 EACH		.		.
3485	SPV.0060 SPECIAL 0006. MONTHLY CPM PROGRESS SCHEDULE UPDATES	20.000 EACH		.		.
3490	SPV.0060 SPECIAL 0010. REMOVING HIGH MAST LIGHTING TOWER CONCRETE BASE	5.000 EACH		.		.
3495	SPV.0060 SPECIAL 0011. REMOVING HIGH MAST LIGHTING TOWER	3.000 EACH		.		.
3505	SPV.0060 SPECIAL 0015. REMOVING UTILITY VAULT	26.000 EACH		.		.
3510	SPV.0060 SPECIAL 0021. REMOVING OLD SIGN STRUCTURE S-40-155	1.000 EACH		.		.
3515	SPV.0060 SPECIAL 0022. REMOVING OLD SIGN STRUCTURE S-40-164	1.000 EACH		.		.
3520	SPV.0060 SPECIAL 0023. REMOVING OLD SIGN STRUCTURE S-40-200	1.000 EACH		.		.
3525	SPV.0060 SPECIAL 0024. REMOVING OLD SIGN STRUCTURE S-40-203	1.000 EACH		.		.
3530	SPV.0060 SPECIAL 0025. REMOVING OLD SIGN STRUCTURE S-40-230	1.000 EACH		.		.

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	SPV.0060 SPECIAL 0026.					
3535	REMOVING OLD SIGN STRUCTURE S-40-262	1.000 EACH		.		.
	SPV.0060 SPECIAL 0027.					
3540	REMOVING OLD SIGN STRUCTURE S-40-27	1.000 EACH		.		.
	SPV.0060 SPECIAL 0028.					
3545	REMOVING OLD SIGN STRUCTURE S-40-308	1.000 EACH		.		.
	SPV.0060 SPECIAL 0029.					
3550	REMOVING OLD SIGN STRUCTURE S-40-310	1.000 EACH		.		.
	SPV.0060 SPECIAL 0030.					
3555	REMOVING OLD SIGN STRUCTURE S-40-311	1.000 EACH		.		.
	SPV.0060 SPECIAL 0031.					
3560	REMOVING OLD SIGN STRUCTURE S-40-312	1.000 EACH		.		.
	SPV.0060 SPECIAL 0032.					
3565	REMOVING OLD SIGN STRUCTURE S-40-33	1.000 EACH		.		.
	SPV.0060 SPECIAL 0033.					
3570	REMOVING OLD SIGN STRUCTURE S-40-36	1.000 EACH		.		.
	SPV.0060 SPECIAL 0034.					
3575	REMOVING OLD SIGN STRUCTURE S-40-37	1.000 EACH		.		.
	SPV.0060 SPECIAL 0035.					
3580	REMOVING OLD SIGN STRUCTURE S-40-38	1.000 EACH		.		.
	SPV.0060 SPECIAL 0036.					
3585	REMOVING OLD SIGN STRUCTURE S-40-391	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0060 SPECIAL 0037.					
3590	REMOVING OLD SIGN STRUCTURE S-40-408	1.000 EACH		.		.
	SPV.0060 SPECIAL 0038.					
3595	REMOVING OLD SIGN STRUCTURE S-40-954	1.000 EACH		.		.
	SPV.0060 SPECIAL 0039.					
3600	REMOVING OLD SIGN STRUCTURE S-40-202	1.000 EACH		.		.
	SPV.0060 SPECIAL 0040.					
3605	REMOVING OLD SIGN STRUCTURE S-40-279	1.000 EACH		.		.
	SPV.0060 SPECIAL 0041.					
3610	REMOVING OLD SIGN STRUCTURE S-40-48	1.000 EACH		.		.
	SPV.0060 SPECIAL 0042.					
3615	REMOVING OLD SIGN STRUCTURE S-40-379	1.000 EACH		.		.
	SPV.0060 SPECIAL 0100.					
3620	SALVAGING CRASH CUSHION	9.000 EACH		.		.
	SPV.0060 SPECIAL 0101.					
3625	TEMPORARY BUS STOP PAD	10.000 EACH		.		.
	SPV.0060 SPECIAL 0104.					
3630	PARKING LOT BOLLARD	8.000 EACH		.		.
	SPV.0060 SPECIAL 0125.					
3635	CONCRETE BARRIER TYPE S56 SPECIAL LIGHT POLE BASE	13.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3640	SPV.0060 SPECIAL 0126. CONCRETE BARRIER TYPE S56A SPECIAL LIGHT POLE BASE	11.000 EACH		.		.
3645	SPV.0060 SPECIAL 0127. CONCRETE BARRIER TRANSITION TYPE G1	1.000 EACH		.		.
3650	SPV.0060 SPECIAL 0128. CONCRETE BARRIER TRANSITION TYPE G2	1.000 EACH		.		.
3655	SPV.0060 SPECIAL 0129. CONCRETE BARRIER TRANSITION TYPE G3	1.000 EACH		.		.
3660	SPV.0060 SPECIAL 0130. CONCRETE BARRIER TRANSITION TYPE G4	1.000 EACH		.		.
3665	SPV.0060 SPECIAL 0131. CONCRETE BARRIER TRANSITION TYPE G5	1.000 EACH		.		.
3670	SPV.0060 SPECIAL 0132. CONCRETE BARRIER TRANSITION TYPE G6	1.000 EACH		.		.
3675	SPV.0060 SPECIAL 0133. CONCRETE BARRIER TRANSITION TYPE G7	1.000 EACH		.		.
3680	SPV.0060 SPECIAL 0134. CONCRETE BARRIER TRANSITION TYPE G8	1.000 EACH		.		.
3685	SPV.0060 SPECIAL 0135. CONCRETE BARRIER TRANSITION TYPE G9	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3690	SPV.0060 SPECIAL 0136. CONCRETE BARRIER TRANSITION TYPE G10	1.000 EACH		.		.
3695	SPV.0060 SPECIAL 0137. CONCRETE BARRIER TRANSITION TYPE G11	1.000 EACH		.		.
3700	SPV.0060 SPECIAL 0138. CONCRETE BARRIER TRANSITION TYPE G12	1.000 EACH		.		.
3705	SPV.0060 SPECIAL 0150. CONCRETE BARRIER TRANSITION TYPE M1	5.000 EACH		.		.
3710	SPV.0060 SPECIAL 0151. CONCRETE BARRIER TRANSITION TYPE M2	1.000 EACH		.		.
3715	SPV.0060 SPECIAL 0152. CONCRETE BARRIER TRANSITION TYPE M3	2.000 EACH		.		.
3720	SPV.0060 SPECIAL 0300. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS, TYPE 1 **P**	13.000 EACH		.		.
3725	SPV.0060 SPECIAL 0301. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS, TYPE 2 **P**	38.000 EACH		.		.
3730	SPV.0060 SPECIAL 0302. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS, TYPE 3 **P**	11.000 EACH		.		.
3735	SPV.0060 SPECIAL 0303. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC WORDS **P**	30.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3740	SPV.0060 SPECIAL 0304. PAVEMENT MARKING GROOVED CONTRAST PREFORMED THERMOPLASTIC ARROWS, TYPE 2	8.000 EACH		.		.
3745	SPV.0060 SPECIAL 0305. PAVEMENT MARKING GROOVED CONTRAST PREFORMED THERMOPLASTIC WORDS	8.000 EACH		.		.
3750	SPV.0060 SPECIAL 0306. PAVEMENT MARKING GROOVED CONTRAST PREFORMED THERMOPLASTIC ARROWS TYPE 4	7.000 EACH		.		.
3755	SPV.0060 SPECIAL 0400. TRAFFIC CONTROL CLOSE-OPEN FREEWAY ENTRANCE RAMP	850.000 EACH		.		.
3760	SPV.0060 SPECIAL 0401. TRAFFIC CONTROL CLOSE-OPEN FREEWAY TO FREEWAY SYSTEM RAMP	590.000 EACH		.		.
3765	SPV.0060 SPECIAL 0402. TRAFFIC CONTROL INTERIM FREEWAY LANE CLOSURE	2,265.000 EACH		.		.
3770	SPV.0060 SPECIAL 0403. TRAFFIC CONTROL LOCAL ROAD LANE CLOSURES	30.000 EACH		.		.
3775	SPV.0060 SPECIAL 0404. TRAFFIC CONTROL COVERING SIGNS TYPE I LEFT IN PLACE	27.000 EACH		.		.
3780	SPV.0060 SPECIAL 0405. TEMPORARY SIGN PORTABLE SUPPORT	11.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3785	SPV.0060 SPECIAL 0406. MOBILIZATIONS EMERGENCY PAVEMENT REPAIR	8.000 EACH		.		.
3790	SPV.0060 SPECIAL 0407. INSTALLING STATE FURNISHED SIGNS	263.000 EACH		.		.
3791	SPV.0060 SPECIAL 0408. TRAFFIC CONTROL FULL FREEWAY CLOSURE	280.000 EACH		.		.
3795	SPV.0060 SPECIAL 0500. TRAFFIC CONTROL DRUMS LEFT IN PLACE	664.000 EACH		.		.
3800	SPV.0060 SPECIAL 0501. TRAFFIC CONTROL BARRICADES TYPE II LEFT IN PLACE	7.000 EACH		.		.
3805	SPV.0060 SPECIAL 0502. TRAFFIC CONTROL BARRICADES TYPE III LEFT IN PLACE	66.000 EACH		.		.
3810	SPV.0060 SPECIAL 0503. TRAFFIC CONTROL WARNING LIGHTS TYPE A LEFT IN PLACE	132.000 EACH		.		.
3815	SPV.0060 SPECIAL 0504. TRAFFIC CONTROL WARNING LIGHTS TYPE C LEFT IN PLACE	99.000 EACH		.		.
3820	SPV.0060 SPECIAL 0505. TRAFFIC CONTROL SIGNS LEFT IN PLAC	103.000 EACH		.		.
3825	SPV.0060 SPECIAL 0506. TRAFFIC CONTROL DETOUR SIGNS LEFT IN PLACE	815.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3830	SPV.0060 SPECIAL 0507. CRASH CUSHION TEMPORARY LEFT IN PLACE	36.000 EACH		.		.
3835	SPV.0060 SPECIAL 0800. SURFACE SETTLEMENT PLATES	4.000 EACH		.		.
3840	SPV.0060 SPECIAL 0900. LED PARKING LOT LIGHTING ASSEMBLY	3.000 EACH		.		.
3845	SPV.0060 SPECIAL 0902. REMOVING EXISTING FLOODLIGHT ASSEMBLY	4.000 EACH		.		.
3850	SPV.0060 SPECIAL 0903. RELOCATING EXISTING LIGHTING ASSEMBLY	3.000 EACH		.		.
3855	SPV.0060 SPECIAL 1010. LAMP DISPOSAL HIGH INTENSITY DISCHARGE	253.000 EACH		.		.
3860	SPV.0060 SPECIAL 1019. RELOCATING LIGHT POLES, ARMS AND LUMINAIRES	4.000 EACH		.		.
3865	SPV.0060 SPECIAL 1020. SALVAGING LIGHT POLES AND ARMS - WEST ALLIS	11.000 EACH		.		.
3870	SPV.0060 SPECIAL 1021. SALVAGING LIGHT POLES, ARMS AND LUMINAIRES - WEST ALLIS	14.000 EACH		.		.
3875	SPV.0060 SPECIAL 1031. REMOVING ALUMINUM LIGHT POLES, AND ARMS - WAUWATOSA	9.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3880	SPV.0060 SPECIAL 1032. REMOVING CONCRETE LIGHT POLES, AND ARMS - WAUWATOSA	5.000 EACH		.		.
3885	SPV.0060 SPECIAL 1033. REMOVING ALUMINUM LIGHT POLES, ARMS AND LUMINAIRES	105.000 EACH		.		.
3890	SPV.0060 SPECIAL 1035. WOOD POLE LIGHTING 60-FT	70.000 EACH		.		.
3895	SPV.0060 SPECIAL 1036. POLES WOOD 60-FT	22.000 EACH		.		.
3900	SPV.0060 SPECIAL 1037. POLES WOOD 35-FT	2.000 EACH		.		.
3905	SPV.0060 SPECIAL 1038. MOVING POLES WOOD 60-FT AND FLOODLIGHTS	6.000 EACH		.		.
3910	SPV.0060 SPECIAL 1040. REMOVING POLES WOOD 60-FT AND FLOODLIGHTS	38.000 EACH		.		.
3915	SPV.0060 SPECIAL 1041. REMOVING POLES WOOD 60-FT	10.000 EACH		.		.
3920	SPV.0060 SPECIAL 1051. PULL BOXES STEEL 24X42-INCH GROUNDED	3.000 EACH		.		.
3925	SPV.0060 SPECIAL 1056. JUNCTION BOXES 18X12X6-INCH COATED	17.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3930	SPV.0060 SPECIAL 1065. LUMINAIRE UTILITY LED E	13.000 EACH		.		.
3935	SPV.0060 SPECIAL 1070. LUMINAIRES FLOODLIGHT 1000W HPS	73.000 EACH		.		.
3940	SPV.0060 SPECIAL 1071. LUMINAIRES FLOODLIGHT 400W HPS	11.000 EACH		.		.
3945	SPV.0060 SPECIAL 1078. LUMINAIRE (UDL) WALLPACK LED	20.000 EACH		.		.
3950	SPV.0060 SPECIAL 1090. SALVAGE DISTRIBUTION CENTERS	5.000 EACH		.		.
3955	SPV.0060 SPECIAL 1096. LIGHTING CONTROL CABINET 240/480 VAC	4.000 EACH		.		.
3960	SPV.0060 SPECIAL 1100. LIGHTING CONTROL CABINET 480/277 VAC	3.000 EACH		.		.
3965	SPV.0060 SPECIAL 1101. CONCRETE CONTROL CABINET BASES, SPECIAL	8.000 EACH		.		.
3970	SPV.0060 SPECIAL 1130. POLES ALUMINUM TYPE F	14.000 EACH		.		.
3975	SPV.0060 SPECIAL 1131. CONCRETE BASES TYPE B	16.000 EACH		.		.
3980	SPV.0060 SPECIAL 1132. CONCRETE BASES TYPE 5L	2.000 EACH		.		.

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3985	SPV.0060 SPECIAL 1152. ELECTRICAL SERVICE METER BREAKER PEDESTAL TEMPORARY LIGHTING	1.000 EACH		.		.
3990	SPV.0060 SPECIAL 1153. REMOVING ELECTRICAL SERVICE METER BREAKER PEDESTAL LIGHTING	6.000 EACH		.		.
3995	SPV.0060 SPECIAL 2001. GROUND ROD	24.000 EACH		.		.
4000	SPV.0060 SPECIAL 2002. REMOVING RAMP CONTROL SIGNAL ASSEMBLY SIDEMOUNT	8.000 EACH		.		.
4005	SPV.0060 SPECIAL 2003. REMOVING CONTROLLER CABINET	8.000 EACH		.		.
4010	SPV.0060 SPECIAL 2004. REMOVING CONTROLLER CABINET BASE	8.000 EACH		.		.
4015	SPV.0060 SPECIAL 2005. REMOVING CONTROLLER RAMP METER PROCESSOR ASSEMBLY	4.000 EACH		.		.
4020	SPV.0060 SPECIAL 2006. REMOVING ELECTRICAL SERVICE METER BREAKER PEDESTAL	2.000 EACH		.		.
4025	SPV.0060 SPECIAL 2007. REMOVING COMMUNICATION VAULT	3.000 EACH		.		.
4030	SPV.0060 SPECIAL 2008. REMOVING OVERHEAD FREEWAY DMS	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4035	SPV.0060 SPECIAL 2009. REMOVING MICROWAVE DETECTOR ASSEMBLY	5.000 EACH		.		.
4040	SPV.0060 SPECIAL 2010. INSTALL PORTABLE VIDEO SURVEILLANCE SYSTEM	2.000 EACH		.		.
4045	SPV.0060 SPECIAL 2011. RELOCATING PORTABLE VIDEO SURVEILLANCE SYSTEM	4.000 EACH		.		.
4050	SPV.0060 SPECIAL 2012. INSTALL TEMPORARY VEHICLE DETECTOR ASSEMBLY	10.000 EACH		.		.
4055	SPV.0060 SPECIAL 2013. REFOCUSING TEMPORARY VEHICLE DETECTOR ASSEMBLY	45.000 EACH		.		.
4060	SPV.0060 SPECIAL 2014. REMOVING COMMUNICATION HUB BUILDING	1.000 EACH		.		.
4065	SPV.0060 SPECIAL 2015. REMOVING COMMUNICATION HUB BUILDING FOUNDATION	1.000 EACH		.		.
4070	SPV.0060 SPECIAL 2016. REMOVING ELECTRONIC BLANK OUT SIGN ASSEMBLY	2.000 EACH		.		.
4075	SPV.0060 SPECIAL 2017. INSTALL 5.8 GHZ ETHERNET BRIDGE	1.000 EACH		.		.
4080	SPV.0060 SPECIAL 2018. REMOVING ON-RAMP CLOSURE GATE	1.000 EACH		.		.

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4085	SPV.0060 SPECIAL 2019. INSTALL FIBER OPTIC MEDIA CONVERTER	12.000 EACH		.		.
4090	SPV.0060 SPECIAL 2020. INSTALLING CONDUIT INTO EXISTING MANHOLE	4.000 EACH		.		.
4095	SPV.0060 SPECIAL 2021. 4-FT DIAMETER MANHOLE TYPE TES	3.000 EACH		.		.
4100	SPV.0060 SPECIAL 2022. ADJUSTING TES MANHOLE	17.000 EACH		.		.
4105	SPV.0060 SPECIAL 2023. 4' DIAMETER "DOGHOUSE" MANHOLE TYPE TES	1.000 EACH		.		.
4110	SPV.0060 SPECIAL 2030. INSTALL CABINET HEATER AND THERMOSTAT	2.000 EACH		.		.
4115	SPV.0060 SPECIAL 2031. INSTALL WAVETRONIX CLICK 200 MODULE	4.000 EACH		.		.
4120	SPV.0060 SPECIAL 2032. INSTALL WAVETRONIX POWER MODULE	4.000 EACH		.		.
4125	SPV.0060 SPECIAL 2033. INSTALL WAVETRONIX DETECTOR MODULE	4.000 EACH		.		.
4130	SPV.0060 SPECIAL 2034. INSTALL CELLULAR ANTENNA	4.000 EACH		.		.
4135	SPV.0060 SPECIAL 2040. WIRELESS TRAFFIC SENSOR	11.000 EACH		.		.

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4140	SPV.0060 SPECIAL 2041. WIRELESS TRAFFIC SENSOR ACCESS POINT	1.000 EACH		.		.
4145	SPV.0060 SPECIAL 2042. WIRELESS TRAFFIC SENSOR REPEATER	2.000 EACH		.		.
4150	SPV.0060 SPECIAL 2043. WIRELESS TRAFFIC SENSOR CONTACT CLOSURE MODULE	1.000 EACH		.		.
4155	SPV.0060 SPECIAL 2044. WIRELESS TRAFFIC SENSOR CONTACT CLOSURE EXTENSION CARD	5.000 EACH		.		.
4160	SPV.0060 SPECIAL 2045. ADJUSTING COMMUNICATION VAULT	1.000 EACH		.		.
4165	SPV.0060 SPECIAL 2046. LOOP DETECTOR WIRE PROTECTION	7.000 EACH		.		.
4170	SPV.0060 SPECIAL 2047. REMOVING TEMPORARY VEHICLE DETECTOR ASSEMBLY	7.000 EACH		.		.
4175	SPV.0060 SPECIAL 3001. CONCRETE BASES TYPE 1 SPREAD FOOTING	3.000 EACH		.		.
4180	SPV.0060 SPECIAL 3002. CONCRETE CONTROL CABINET BASE TYPE 9 SPECIAL (MOD)	2.000 EACH		.		.
4185	SPV.0060 SPECIAL 3005. TRAFFIC SIGNAL VAULT	2.000 EACH		.		.

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	SPV.0060 SPECIAL 3103.					
4190	TRAFFIC POLYMER CONCRETE VAULT 13-IN X 24-IN X 18-IN	7.000 EACH		.		.
	SPV.0060 SPECIAL 3104.					
4195	TRAFFIC POLYMER CONCRETE VAULT 17-IN X 30-IN X 18-IN	1.000 EACH		.		.
	SPV.0060 SPECIAL 4100.					
4200	ANCHOR ASSEMBLIES SIGN BRIDGE STRUCTURES	9.000 EACH		.		.
	SPV.0060 SPECIAL 4105.					
4205	ANCHOR ASSEMBLIES NOISE BARRIER STRUCTURES	322.000 EACH		.		.
	SPV.0060 SPECIAL 4110.					
4210	PILE DYNAMIC ANALYZER (PDA) TESTING	57.000 EACH		.		.
	SPV.0060 SPECIAL 4115.					
4215	PILE DYNAMIC ANALYZER (PDA) RESTRIKES	57.000 EACH		.		.
	SPV.0060 SPECIAL 4120.					
4220	BEARINGS HIGH-LOAD MULTI-ROTATIONAL FIXED	4.000 EACH		.		.
	SPV.0060 SPECIAL 4125.					
4225	BEARINGS HIGH-LOAD MULTI-ROTATIONAL GUIDED	37.000 EACH		.		.
	SPV.0060 SPECIAL 4130.					
4230	FLOOR DRAIN SPECIAL	7.000 EACH		.		.
	SPV.0060 SPECIAL 4140.					
4235	ANCHOR SLAB INLET COVER SPECIAL	31.000 EACH		.		.

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4240	SPV.0060 SPECIAL 4150. TIEBACK ANCHORS	566.000 EACH		.		.
4245	SPV.0060 SPECIAL 4155. TIEBACK ANCHORS PERFORMANCE TESTS	29.000 EACH		.		.
4250	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	4.000 EACH		.		.
4255	SPV.0060 SPECIAL 4170. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 78.74-IN	4.000 EACH		.		.
4260	SPV.0060 SPECIAL 4175. THERMAL INTEGRITY PROFILER (TIP) TESTING WALL SECANT PILE 47. 24-IN	3.000 EACH		.		.
4265	SPV.0060 SPECIAL 4180. PRECAST BEAMS	2.000 EACH		.		.
4270	SPV.0060 SPECIAL 4190. CONCRETE POLYMER PULL BOX	8.000 EACH		.		.
4275	SPV.0060 SPECIAL 4195. CONCRETE BASE SLEEVES	2.000 EACH		.		.
4280	SPV.0060 SPECIAL 5000. REMOVING HYDRANT	29.000 EACH		.		.
4285	SPV.0060 SPECIAL 5001. INSTALL HYDRANT	29.000 EACH		.		.

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4290	SPV.0060 SPECIAL 5002. CONNECT ORIGINAL SERVICE (C.O.S.)	52.000 EACH		.		.
4295	SPV.0060 SPECIAL 5003. REPLACE ORIGINAL SERVICE (R.O.S)	9.000 EACH		.		.
4300	SPV.0060 SPECIAL 5004. ADJUSTING WATER VALVE	54.000 EACH		.		.
4305	SPV.0060 SPECIAL 5005. ROADWAY SERVICE BOX (R.S.B.)	1.000 EACH		.		.
4310	SPV.0060 SPECIAL 5007. 72-INCH PRECAST VALVE VAULT WITH 24-INCH D.D. GATE VALVE	2.000 EACH		.		.
4315	SPV.0060 SPECIAL 5008. PERMANENT CONNECTION TO EXISTING 24-INCH WATER MAIN	3.000 EACH		.		.
4320	SPV.0060 SPECIAL 5009. TEMPORARY CONNECTION TO EXISTING 24-INCH WATER MAIN	1.000 EACH		.		.
4325	SPV.0060 SPECIAL 5010. GROUND HYDRANT ASSEMBLY	2.000 EACH		.		.
4330	SPV.0060 SPECIAL 5011. ADJUSTING SANITARY MANHOLE	46.000 EACH		.		.
4335	SPV.0060 SPECIAL 5013. RECONSTRUCT SANITARY MANHOLE	3.000 EACH		.		.

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4340	SPV.0060 SPECIAL 5100. SAN SEWER DROP MH PRECAST CONC 48-INCH W/ CASTING	5.000 EACH		.		.
4345	SPV.0060 SPECIAL 5101. SAN SEWER MH PRECAST CONC 48-INCH W/ CASTING	30.000 EACH		.		.
4350	SPV.0060 SPECIAL 5102. SANITARY MANHOLE VACUUM TESTING	35.000 EACH		.		.
4355	SPV.0060 SPECIAL 5103. REMOVING SANITARY MANHOLE	20.000 EACH		.		.
4360	SPV.0060 SPECIAL 5104. ABANDONING SANITARY MANHOLE	3.000 EACH		.		.
4365	SPV.0060 SPECIAL 5107. PARTIAL ABANDONMENT OF MMSD SANITARY MANHOLE	1.000 EACH		.		.
4370	SPV.0060 SPECIAL 5108. ABANDONING MMSD ACCESS PANEL	1.000 EACH		.		.
4375	SPV.0060 SPECIAL 8004. INLET COVERS TYPE 57	12.000 EACH		.		.
4380	SPV.0060 SPECIAL 8005. COVER PLATE LEFT IN PLACE	42.000 EACH		.		.
4385	SPV.0060 SPECIAL 8007. RECONNECT STORM SEWER LATERALS	115.000 EACH		.		.
4390	SPV.0060 SPECIAL 8012. MANHOLES 9-FT SPECIAL	30.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4395	SPV.0060 SPECIAL 8013. MANHOLES 10-FT SPECIAL	12.000 EACH		.		.
4400	SPV.0060 SPECIAL 8015. PIPE CONNECTION TO EXISTING STRUCTURE	43.000 EACH		.		.
4405	SPV.0060 SPECIAL 8017. SEDIMENTATION BASIN	16.000 EACH		.		.
4410	SPV.0060 SPECIAL 8018. REMOVING BULKHEAD	6.000 EACH		.		.
4415	SPV.0060 SPECIAL 8040. EMERGENCY SHAFT	2.000 EACH		.		.
4420	SPV.0060 SPECIAL 8050. INLET COVERS TYPE 27-M	127.000 EACH		.		.
4425	SPV.0060 SPECIAL 8052. REMOVING WELDS FROM STORM SEWER COVERS	9.000 EACH		.		.
4430	SPV.0060 SPECIAL 8062. REMOVE AND CAP EXISTING DRAINAGE STORM SEWER STRUCTURE	12.000 EACH		.		.
4435	SPV.0060 SPECIAL 8080. WELDING SEWER ACCESS COVERS	26.000 EACH		.		.
4440	SPV.0060 SPECIAL 8500. STORM SEWER STRUCTURE Z813	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4445	SPV.0060 SPECIAL 8501. STORM SEWER STRUCTURE Z2822	1.000 EACH		.		.
4450	SPV.0060 SPECIAL 8502. STORM SEWER STRUCTURE Z4048	1.000 EACH		.		.
4455	SPV.0060 SPECIAL 8503. STORM SEWER STRUCTURE Z4619	1.000 EACH		.		.
4460	SPV.0060 SPECIAL 8504. STORM SEWER STRUCTURE Z4621	1.000 EACH		.		.
4465	SPV.0060 SPECIAL 8505. STORM SEWER STRUCTURE Z5348	1.000 EACH		.		.
4470	SPV.0060 SPECIAL 8506. STORM SEWER STRUCTURE Z6374	1.000 EACH		.		.
4475	SPV.0060 SPECIAL 8507. STORM SEWER STRUCTURE Z6382	1.000 EACH		.		.
4480	SPV.0060 SPECIAL 8508. STORM SEWER STRUCTURE Z6661	1.000 EACH		.		.
4485	SPV.0060 SPECIAL 8509. STORM SEWER STRUCTURE Z6666D	1.000 EACH		.		.
4490	SPV.0060 SPECIAL 8510. STORM SEWER STRUCTURE Z6707	1.000 EACH		.		.
4495	SPV.0060 SPECIAL 8511. STORM SEWER STRUCTURE Z6725	1.000 EACH		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4500	SPV.0060 SPECIAL 8512. STORM SEWER STRUCTURE Z6753A	1.000 EACH		.		.
4505	SPV.0060 SPECIAL 8513. STORM SEWER STRUCTURE Z6753C	1.000 EACH		.		.
4510	SPV.0060 SPECIAL 8514. STORM SEWER STRUCTURE Z6764	1.000 EACH		.		.
4515	SPV.0060 SPECIAL 8515. STORM SEWER STRUCTURE Z6828	1.000 EACH		.		.
4520	SPV.0060 SPECIAL 8516. STORM SEWER STRUCTURE Z6852	1.000 EACH		.		.
4525	SPV.0060 SPECIAL 8517. STORM SEWER STRUCTURE Z6647	1.000 EACH		.		.
4530	SPV.0060 SPECIAL 8518. STORM SEWER STRUCTURE Z6390	1.000 EACH		.		.
4535	SPV.0060 SPECIAL 8519. STORM SEWER STRUCTURE Z7945	1.000 EACH		.		.
4540	SPV.0075 SPECIAL 0010. OBSTRUCTIONS TRENCHLESS UTILITY CONSTRUCTION	15.000 HRS		.		.
4545	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	62.000 HRS		.		.
4550	SPV.0075 SPECIAL 4205. OBSTRUCTIONS WALL SECANT PILE	12.000 HRS		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0075 SPECIAL 4210.					
4555	OBSTRUCTIONS FOUNDATION DRILLING	72.000 HRS		.		.
	SPV.0075 SPECIAL 4215.					
4560	OBSTRUCTIONS SIGN SUPPORTS CONCRETE MASONRY	44.000 HRS		.		.
	SPV.0075 SPECIAL 8097.					
4565	OBSTRUCTIONS TUNNEL EXCAVATION	44.000 HRS		.		.
	SPV.0085 SPECIAL 0200.					
4570	SEEDING MIXTURE NATIVE SEED BUTTERFLY MIX	87.000 LB		.		.
	SPV.0085 SPECIAL 0900.					
4575	ICE HPC HOT WEATHER CONCRETING	1,269,600 LB		0.75000		952200.00
	SPV.0085 SPECIAL 4300.					
4580	BAR STEEL REINFORCEMENT HS STAINLESS BRIDGES	700,224.000 LB		.		.
	SPV.0085 SPECIAL 4310.					
4585	POST-TENSIONING INTEGRAL PIER CAP	8,795.000 LB		.		.
	SPV.0090 SPECIAL 0010.					
4590	REMOVING PAVEMENT MARKINGS WATER BLASTING	10,000.000 LF		.		.
	SPV.0090 SPECIAL 0011.					
4595	REMOVING CONCRETE BARRIER TEMPORARY PRECAST	12,100.000 LF		.		.
	SPV.0090 SPECIAL 0012.					
4600	REMOVING TEMPORARY SHORING LEFT IN PLACE	122.000 LF		.		.

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0090 SPECIAL 0014.					
4605	REMOVING STEEL PIPE	775.000 LF		.		.
	SPV.0090 SPECIAL 0015.					
4610	REMOVING WATER PIPE	700.000 LF		.		.
	SPV.0090 SPECIAL 0016.					
4615	REMOVING CONCRETE ENCASED DUCT BANK	6,043.000 LF		.		.
	SPV.0090 SPECIAL 0100.					
4620	CONCRETE BARRIER TYPE S42C WITH 48-INCH PAN **P**	1,033.000 LF		.		.
	SPV.0090 SPECIAL 0101.					
4625	CONCRETE BARRIER TYPE S56 SPECIAL **P**	1,867.000 LF		.		.
	SPV.0090 SPECIAL 0102.					
4630	CONCRETE BARRIER TYPE S56A SPECIAL **P**	2,378.000 LF		.		.
	SPV.0090 SPECIAL 0103.					
4635	CONCRETE BARRIER TYPE S42 WITH 24-INCH PAN **P**	6,786.000 LF		.		.
	SPV.0090 SPECIAL 0104.					
4640	CONCRETE BARRIER VERTICAL BACK TYPE S42-INCH MOD WITH 24-INCH PAN **P**	3,340.000 LF		.		.
	SPV.0090 SPECIAL 0105.					
4645	CONCRETE BARRIER TYPE S56 WITH 24-INCH PAN **P**	250.000 LF		.		.

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	SPV.0090 SPECIAL 0125.					
4650	MAINTAIN CONCRETE BARRIER TEMPORARY PRECAST	23,555.000 LF		.		.
	SPV.0090 SPECIAL 0126.					
4655	PIPE UNDERDRAIN 6-INCH SPECIAL	65,601.000 LF		.		.
	SPV.0090 SPECIAL 0150.					
4660	CONCRETE GUTTER SPECIAL **P**	1,507.000 LF		.		.
	SPV.0090 SPECIAL 0151.					
4665	CONCRETE CURB & GUTTER 37-INCH **P**	81.000 LF		.		.
	SPV.0090 SPECIAL 0152.					
4670	CONCRETE CURB & GUTTER 4-INCH SLOPED 60-INCH TYPE A **P**	1,076.000 LF		.		.
	SPV.0090 SPECIAL 0300.					
4675	PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC STOP LINE, 18-INCH **P**	68.000 LF		.		.
	SPV.0090 SPECIAL 0301.					
4680	PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC STOP LINE, 24-INCH **P**	1,013.000 LF		.		.
	SPV.0090 SPECIAL 0302.					
4685	PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC CROSSWALK, 6-INCH **P**	823.000 LF		.		.
	SPV.0090 SPECIAL 0303.					
4690	PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC CROSSWALK, 12-INCH **P**	3,116.000 LF		.		.

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	SPV.0090 SPECIAL 0305.					
4695	PAVEMENT MARKING GROOVD	36.000				
	PREFORMD THERMOPLASTIC	LF				
	ZEBRA MARKING, 24 IN					
	P			.		.
	SPV.0090 SPECIAL 0310.					
4700	PAVEMENT MARKING	5,028.000				
	CONTRAST EPOXY 7-INCH	LF				
	P			.		.
	SPV.0090 SPECIAL 0311.					
4705	PAVEMENT MARKING	718.000				
	CONTRAST EPOXY 11-INCH	LF				
	P			.		.
	SPV.0090 SPECIAL 0400.					
4710	GLARE SCREENS TEMPORARY	3,263.000				
		LF		.		.
	SPV.0090 SPECIAL 0401.					
4715	TRAFFIC CHANNELIZING	760.000				
	CURB SYSTEM	LF		.		.
	SPV.0090 SPECIAL 0501.					
4720	GLARE SCREENS TEMPORARY	2,698.000				
	LEFT IN PLACE	LF		.		.
	SPV.0090 SPECIAL 0502.					
4725	CONCRETE BARRIER	39,835.000				
	TEMPORARY PRECAST	LF				
	DELIVERED SPECIAL **P**			.		.
	SPV.0090 SPECIAL 0600.					
4730	FENCE TEMPORARY 6-FT	1,060.000				
		LF		.		.
	SPV.0090 SPECIAL 0602.					
4735	FENCE TEMPORARY LEFT IN	1,834.000				
	PLACE 6-FT	LF		.		.

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	SPV.0090 SPECIAL 0603.					
4740	FENCE TEMPORARY LEFT IN PLACE 8-FT	1,603.000 LF		.		.
	SPV.0090 SPECIAL 0604.					
4745	FENCE CHAIN LINK SCREENING 6-FT	5,435.000 LF		.		.
	SPV.0090 SPECIAL 0900.					
4750	MINOR RETAINING WALL R-1	331.000 LF		.		.
	SPV.0090 SPECIAL 0901.					
4755	MINOR RETAINING WALL R-2	154.000 LF		.		.
	SPV.0090 SPECIAL 1005.					
4760	CABLE AERIAL ALUMINUM 6 AWG QUADRUPLEX	10,417.000 LF		.		.
	SPV.0090 SPECIAL 1006.					
4765	CABLE AERIAL ALUMINUM 4 AWG QUADRUPLEX	9,538.000 LF		.		.
	SPV.0090 SPECIAL 1007.					
4770	CABLE AERIAL ALUMINUM 2 AWG QUADRUPLEX	1,258.000 LF		.		.
	SPV.0090 SPECIAL 1009.					
4775	CABLE AERIAL ALUMINUM 6 AWG TRIPLEX	496.000 LF		.		.
	SPV.0090 SPECIAL 1010.					
4780	CABLE AERIAL ALUMINUM 4 AWG TRIPLEX	1,800.000 LF		.		.
	SPV.0090 SPECIAL 1011.					
4785	CABLE AERIAL ALUMINUM 2 AWG TRIPLEX	72.000 LF		.		.
	SPV.0090 SPECIAL 1026.					
4790	CABLE IN DUCT 5-6 AWG	1,408.000 LF		.		.

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4795	SPV.0090 SPECIAL 2021. 4-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	848.000 LF		.		.
4800	SPV.0090 SPECIAL 2022. 3-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	289.000 LF		.		.
4805	SPV.0090 SPECIAL 2023. 2-DUCT CONDUIT CEMENT ENCASED 4-INCH CONDUIT DB-60	268.000 LF		.		.
4810	SPV.0090 SPECIAL 2024. CONDUIT SUBDUCT 1-INCH	575.000 LF		.		.
4815	SPV.0090 SPECIAL 3001. CABLE TYPE UF 2-14 AWG	6,020.000 LF		.		.
4820	SPV.0090 SPECIAL 3002. WOVEN PULL TAPE	1,126.000 LF		.		.
4825	SPV.0090 SPECIAL 3003. INSTALL CAMERA POWER CABLE	7,046.000 LF		.		.
4830	SPV.0090 SPECIAL 3004. INSTALL CAT-5E CABLE	7,630.000 LF		.		.
4835	SPV.0090 SPECIAL 4400. FENCE DECORATIVE BRIDGE	1,043.000 LF		.		.
4840	SPV.0090 SPECIAL 4410. FENCE DECORATIVE WING	217.000 LF		.		.

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	SPV.0090 SPECIAL 4420.					
4845	FENCE DECORATIVE WALL	1,245.000				
		LF		.		.
	SPV.0090 SPECIAL 4430.					
4850	PILING SLEEVES	2,709.000				
		LF		.		.
	SPV.0090 SPECIAL 4440.					
4855	FOUNDATION DRILLING	29,158.000				
	P	LF		.		.
	SPV.0090 SPECIAL 4445.					
4860	PRE-BORING SPECIAL	312.000				
		LF		.		.
	SPV.0090 SPECIAL 4450.					
4865	WALL SECANT PILE 47.	446.000				
	24-INCH **P**	LF		.		.
	SPV.0090 SPECIAL 4455.					
4870	DRILLED FOUNDATION SHAFT	289.200				
	78.74-INCH **P**	LF		.		.
	SPV.0090 SPECIAL 4470.					
4875	SHEET PILING INTERLOCK	2,490.000				
	WATERPROOFING	LF		.		.
	SPV.0090 SPECIAL 4480.					
4880	PRESTRESSED GIRDER TYPE	266.000				
	I 54W-INCH SPECIAL	LF		.		.
	SPV.0090 SPECIAL 5000.					
4885	STEEL CASING WITH	116.000				
	DUCTILE IRON 12-INCH	LF				
	CARRIER			.		.
	SPV.0090 SPECIAL 5001.					
4890	STEEL CASING WITH	317.000				
	DUCTILE IRON 16-INCH	LF				
	CARRIER			.		.

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	SPV.0090 SPECIAL 5002.					
4895	STEEL CASING WITH DUCTILE IRON 24-INCH CARRIER	421.000 LF		.		.
	SPV.0090 SPECIAL 5003.					
4900	DUCTILE IRON HYDRANT BRANCH 6-INCH	361.000 LF		.		.
	SPV.0090 SPECIAL 5004.					
4905	DUCTILE IRON WATER MAIN 6-INCH	1,004.000 LF		.		.
	SPV.0090 SPECIAL 5005.					
4910	DUCTILE IRON WATER MAIN 8-INCH	979.000 LF		.		.
	SPV.0090 SPECIAL 5006.					
4915	DUCTILE IRON WATER MAIN 12-INCH RESTRAINED JOINT	71.000 LF		.		.
	SPV.0090 SPECIAL 5007.					
4920	DUCTILE IRON WATER MAIN 16-INCH	5,469.000 LF		.		.
	SPV.0090 SPECIAL 5008.					
4925	DUCTILE IRON WATER MAIN RESTRAINED JOINT 16-INCH RESTRAINED JOINT	100.000 LF		.		.
	SPV.0090 SPECIAL 5009.					
4930	DUCTILE IRON WATER MAIN 24-INCH RESTRAINED JOINT	42.000 LF		.		.
	SPV.0090 SPECIAL 5010.					
4935	DUCTILE IRON (DI) AWWA C-151 CL. 55 WATER MAIN 24-INCH	134.000 LF		.		.
	SPV.0090 SPECIAL 5011.					
4940	DUCTILE IRON (DI) AWWA C-151 CL. 55 WATER MAIN 16-INCH	54.000 LF		.		.

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	SPV.0090 SPECIAL 5012.					
4945	DUCTILE IRON (DI) AWWA C-151 CL.55 WM 24-IN WITH 42-IN STEEL CASING	340.000 LF		.		.
	SPV.0090 SPECIAL 5100.					
4950	ABANDONING SANITARY SEWER 8-INCH	1,124.000 LF		.		.
	SPV.0090 SPECIAL 5102.					
4955	ABANDONING SANITARY SEWER 12-INCH	1,005.000 LF		.		.
	SPV.0090 SPECIAL 5103.					
4960	SANITARY AIR TESTING	3,085.000 LF		.		.
	SPV.0090 SPECIAL 5104.					
4965	SANITARY SEWER LINING 8-INCH CURED-IN-PLACE	349.000 LF		.		.
	SPV.0090 SPECIAL 5105.					
4970	STEEL CASING WITH 8-INCH SANITARY SEWER CARRIER	655.000 LF		.		.
	SPV.0090 SPECIAL 5106.					
4975	STEEL CASING W/ 12-INCH SANITARY SEWER CARRIER	376.000 LF		.		.
	SPV.0090 SPECIAL 5107.					
4980	STEEL CASING WITH 6-INCH SANITARY SEWER CARRIER	18.000 LF		.		.
	SPV.0090 SPECIAL 5108.					
4985	SANITARY SEWER LATERAL CLASS "C" BEDDING	164.000 LF		.		.
	SPV.0090 SPECIAL 5109.					
4990	SANITARY SEWER 8-INCH SDR 35 CLASS "C" BEDDING	1,862.000 LF		.		.

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4995	SPV.0090 SPECIAL 5110. SANITARY SEWER 10-INCH SDR 35 CLASS "C" BEDDING	20.000 LF		.		.
5000	SPV.0090 SPECIAL 5111. SANITARY SEWER 12-INCH SDR 35 CLASS "C" BEDDING	917.000 LF		.		.
5005	SPV.0090 SPECIAL 5112. SANITARY SEWER 8-INCH SDR 26 CLASS "C" BEDDING	555.000 LF		.		.
5010	SPV.0090 SPECIAL 5113. SANITARY SEWER 12-INCH SDR 26 CLASS "C" BEDDING	33.000 LF		.		.
5015	SPV.0090 SPECIAL 5114. SANITARY SEWER 12-INCH RCP CLASS V WITH CONCRETE ENCASEMENT	16.000 LF		.		.
5020	SPV.0090 SPECIAL 5115. REMOVING SANITARY SEWER PIPE	2,077.000 LF		.		.
5025	SPV.0090 SPECIAL 8002. STORM SEWER PIPE REINFORCED CONC HORIZ ELLIP CLS HE-III 77X121-IN	978.000 LF		.		.
5030	SPV.0090 SPECIAL 8003. STORM SEWER PIPE REINFORCED CONC HORIZ ELLIP CLS HE-IV 77X121-IN	489.000 LF		.		.
5035	SPV.0090 SPECIAL 8004. STORM SEWER PIPE REINFORCED CONC HORIZ ELLIP CLASS HE-IV 38X60-IN	363.000 LF		.		.

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5040	SPV.0090 SPECIAL 8025. PIPE UNDERDRAIN EXPLORATION	400.000 LF		.		.
5045	SPV.0090 SPECIAL 8026. STORM SEWER LATERAL EXPLORATION	400.000 LF		.		.
5050	SPV.0090 SPECIAL 8030. DRAIN SLOTTED VANE LONGITUDINAL	2,577.000 LF		.		.
5055	SPV.0090 SPECIAL 8096. TUNNEL EXCAVATION **P**	1,474.000 LF		.		.
5060	SPV.0105 SPECIAL 0001. SURVEY PROJECT 1060-33-80	LUMP	LUMP			.
5065	SPV.0105 SPECIAL 0002. PAVEMENT CLEANUP PROJECT 1060-33-80	LUMP	LUMP			.
5070	SPV.0105 SPECIAL 0003. CONCRETE PAVEMENT JOINT LAYOUT	LUMP	LUMP			.
5075	SPV.0105 SPECIAL 0010. REMOVING GEODETIC SURVEY MONUMENT 2X03	LUMP	LUMP			.
5080	SPV.0105 SPECIAL 0011. REMOVING GEODETIC SURVEY MONUMENT MILWAUKEE GPS AZ MARK	LUMP	LUMP			.
5085	SPV.0105 SPECIAL 0015. REMOVING PLAYGROUND	LUMP	LUMP			.

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5090	SPV.0105 SPECIAL 0016. REMOVING WEATHER STATION CHESTER STREET	LUMP	LUMP			.
5095	SPV.0105 SPECIAL 0017. REMOVING WEATHER STATION ZOOFARI CENTER	LUMP	LUMP			.
5100	SPV.0105 SPECIAL 0100. MOVING SIGN BRIDGE CANTILEVERED S-40-379	LUMP	LUMP			.
5105	SPV.0105 SPECIAL 0101. MOVING SIGN BRIDGE CANTILEVERED S-40-133	LUMP	LUMP			.
5110	SPV.0105 SPECIAL 0102. MOVING SIGN BRIDGE CANTILEVERED S-40-310	LUMP	LUMP			.
5115	SPV.0105 SPECIAL 0905. RAILING TUBULAR STEEL GALVANIZED PEDESTRIAN SOUTH WALL	LUMP	LUMP			.
5120	SPV.0105 SPECIAL 1006. MAINTENANCE OF LIGHTING SYSTEMS	LUMP	LUMP			.
5125	SPV.0105 SPECIAL 1007. LIGHTING SYSTEM INTEGRATOR	LUMP	LUMP			.
5130	SPV.0105 SPECIAL 2023. SAWING CONCRETE-ENCASED DUCT PACKAGE	LUMP	LUMP			.
5135	SPV.0105 SPECIAL 3001. REMOVE TRAFFIC SIGNALS USH 18 & 97TH STREET	LUMP	LUMP			.

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5140	SPV.0105 SPECIAL 3002. REMOVE TRAFFIC SIGNALS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5145	SPV.0105 SPECIAL 3003. TRANSPORTING SIGNAL AND LIGHTING MATERIALS IH 94 RAMPS & STH 181	LUMP	LUMP			.
5150	SPV.0105 SPECIAL 3004. TRANSPORTING SIGNAL AND LIGHTING MATERIALS USH 45 RAMPS & USH 18	LUMP	LUMP			.
5155	SPV.0105 SPECIAL 3005. TRANSPORTING SIGNAL AND LIGHTING MATERIALS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5160	SPV.0105 SPECIAL 3006. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB1	LUMP	LUMP			.
5165	SPV.0105 SPECIAL 3007. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 45 RAMPS & USH 18 CB1	LUMP	LUMP			.
5170	SPV.0105 SPECIAL 3008. TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS IH 94 RAMPS & STH 181	LUMP	LUMP			.
5175	SPV.0105 SPECIAL 3009. TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS USH 45 RAMPS & USH 18	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5180	SPV.0105 SPECIAL 3010. TRANS & INSTL STATE FURN ADAPT TRAF SIG CAMERAS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5185	SPV.0105 SPECIAL 3011. INSTALL STATE FURNISHED EVP DETECTOR HEADS IH 94 RAMPS & STH 181	LUMP	LUMP			.
5190	SPV.0105 SPECIAL 3012. INSTALL STATE FURNISHED EVP DETECTOR HEADS USH 45 RAMPS & USH 18	LUMP	LUMP			.
5195	SPV.0105 SPECIAL 3013. INSTALL STATE FURNISHED EVP DETECTOR HEADS USH 18 & N. 95TH STREET	LUMP	LUMP			.
5200	SPV.0105 SPECIAL 3014. EXISTING TEMPORARY EVP SYSTEM IH 94 EB RAMPS & STH 181	LUMP	LUMP			.
5205	SPV.0105 SPECIAL 3015. EXISTING TEMPORARY EVP SYSTEM IH 94 WB RAMPS & STH 181	LUMP	LUMP			.
5210	SPV.0105 SPECIAL 3016. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 18 & N. 95TH STREET	LUMP	LUMP			.
5215	SPV.0105 SPECIAL 3017. INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET IH 94 RAMPS & STH 181 CB2	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SPV.0105 SPECIAL 3018.					
5220	INSTALL STATE FURNISHED TRAFFIC SIGNAL CABINET USH 45 RAMPS & USH 18 CB2	LUMP	LUMP			.
	SPV.0105 SPECIAL 3019.					
5225	TRANS AND INSTL STATE FURN RADAR DETECTION SYSTEM USH 45 RAMPS & USH 18	LUMP	LUMP			.
	SPV.0105 SPECIAL 3051.					
5235	INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET IH 94 RAMPS & STH 181	LUMP	LUMP			.
	SPV.0105 SPECIAL 3052.					
5240	INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET USH 45 RAMPS & USH 18	LUMP	LUMP			.
	SPV.0105 SPECIAL 3053.					
5245	INSTALL FIBER OPTIC COMMUNICATIONS IN CABINET USH 18 & N. 95TH STREET	LUMP	LUMP			.
	SPV.0105 SPECIAL 4500.					
5250	PAINTING POLYSILOXANE SYSTEM STRUCTURE B-40-855	LUMP	LUMP			.
	SPV.0105 SPECIAL 4520.					
5255	TRIAL SECANT WALL PANEL 47.24-INCH	LUMP	LUMP			.
	SPV.0105 SPECIAL 4540.					
5260	UNDERDECK UTILITY STRUCTURE B-40-866	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5265	SPV.0105 SPECIAL 4550. EXPANSION DEVICE MODULAR LRFD B-40-852	LUMP	LUMP			.
5270	SPV.0105 SPECIAL 4555. EXPANSION DEVICE MODULAR LRFD B-40-855	LUMP	LUMP			.
5275	SPV.0105 SPECIAL 5000. ADLER WATER BOOSTER STATION	LUMP	LUMP			.
5280	SPV.0105 SPECIAL 5001. REMOVING OLD BOOSTER STATION	LUMP	LUMP			.
5285	SPV.0105 SPECIAL 5002. BURLEIGH WATER BOOSTER STATION	LUMP	LUMP			.
5290	SPV.0105 SPECIAL 8098. CONTROL OF WATER	LUMP	LUMP			.
5295	SPV.0105 SPECIAL 8099. GEOTECHNICAL INSTRUMENTATION	LUMP	LUMP			.
5300	SPV.0110 SPECIAL 4600. TIMBER LAGGING **P**	282.400 MBM	.			.
5305	SPV.0135 SPECIAL 0001. VIBRATION MONITORING	300.000 MON	.			.
5310	SPV.0165 SPECIAL 0500. TRAFFIC CONTROL FIXED MESSAGE SIGNS LEFT IN PLACE	3,314.250 SF	.			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5315	SPV.0165 SPECIAL 0900. WALL MODULAR BLOCK MECHANICALLY STABILIZED EARTH LRFD	1,825.000 SF		.		.
5320	SPV.0165 SPECIAL 4700. LONGITUDINAL GROOVING BRIDGE DECK **P**	222,208.000 SF		.		.
5325	SPV.0165 SPECIAL 4710. WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP PILOT **P**	199,433.000 SF		.		.
5330	SPV.0165 SPECIAL 4720. WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD LFCF **P**	13,925.000 SF		.		.
5335	SPV.0165 SPECIAL 4740. TEMP WALL WIRE FACED MECHANICALLY STABILIZED EARTH LRFD/QMP PILOT	13,538.000 SF		.		.
5340	SPV.0165 SPECIAL 4750. GEOCOMPOSITE DRAINBOARD	94,084.000 SF		.		.
5345	SPV.0165 SPECIAL 4770. PRESTRESSED PRECAST CONCRETE WALL PANEL	2,765.000 SF		.		.
5350	SPV.0165 SPECIAL 8095. SHAFT EXCAVATION SUPPORT SYSTEM	28,865.000 SF		.		.
5355	SPV.0180 SPECIAL 0101. JOINT SEALING	40,938.000 SY		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5360	SPV.0180 SPECIAL 0102. CONCRETE PAVEMENT REPAIR SPECIAL	3,000.000 SY		.		.
5365	SPV.0180 SPECIAL 0103. HIGH FRICTION SURFACE TREATMENT CONCRETE	7,446.000 SY		.		.
5370	SPV.0180 SPECIAL 0104. HIGH FRICTION SURFACE TREATMENT ASPHALT	14,592.000 SY		.		.
5375	SPV.0180 SPECIAL 0105. CONCRETE PAVEMENT 12-INCH SPECIAL	227,685.000 SY		.		.
5380	SPV.0180 SPECIAL 0106. ASPHALTIC MATERIAL BINDER	3,407.000 SY		.		.
5385	SPV.0180 SPECIAL 0107. EPOXY RESIN BINDER	250.000 SY		.		.
5390	SPV.0180 SPECIAL 0200. TOPSOIL SPECIAL	368,317.000 SY		.		.
5395	SPV.0180 SPECIAL 0800. GEOGRID REINFORCEMENT	51,388.000 SY		.		.
5400	SPV.0180 SPECIAL 0801. SOIL DRYING	953,800.000 SY		.		.
5405	SPV.0180 SPECIAL 4800. SLOPE PAVING CRUSHED AGGREGATE SPECIAL **P**	1,037.000 SY		.		.
5410	SPV.0195 SPECIAL 0100. COLD PATCH	50.000 TON		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5415	SPV.0195 SPECIAL 0101. ASPHALTIC PAVEMENT REPAIR SPECIAL	2,395.000 TON		.		.
5420	SPV.0195 SPECIAL 0700. MANAGEMENT OF PETROLEUM CONTAMINATED SOIL AND SOLID WASTE	13,942.000 TON		.		.
5425	SPV.0195 SPECIAL 0801. SOIL DRYING AGENT	19,100.000 TON		.		.
7000	203.0200 REMOVING OLD STRUCTURE (STATION) 0017. 265EW+00	LUMP	LUMP			.
7005	511.1300 TEMPORARY SHORING (LOCATION) 0020. 320NS+00 TO 322NS+00	2,497.000 SF		.		.
7010	632.0101 TREES (SPECIES, ROOT, SIZE) 0001. BUCKEYE, HOMESTEAD 1 3/4 - 2 INCH CAL	3.000 EACH		.		.
7015	632.0101 TREES (SPECIES, ROOT, SIZE) 0003. CATALPA, NORTHERN 1 3/4 - 2 INCH CAL	2.000 EACH		.		.
7020	632.0101 TREES (SPECIES, ROOT, SIZE) 0005. COFFEETREE, KENTUCKY B&B 1 1/2 - 1 3/4 INCH CAL	2.000 EACH		.		.
7025	632.0101 TREES (SPECIES, ROOT, SIZE) 0007. HACKBERRY, COMMON B&B 1 3/4 - 2 INCH CAL	2.000 EACH		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
7030	632.0101 TREES (SPECIES, ROOT, SIZE) 0009. HONEYLOCUST, SKYLINE 1 3/4 - 2 INCH CAL	3.000 EACH		.		.
7035	632.0101 TREES (SPECIES, ROOT, SIZE) 0011. OAK, HERITAGE 1 3/4 - 2 INCH CAL	1.000 EACH		.		.
7040	632.0101 TREES (SPECIES, ROOT, SIZE) 0013. OAK, SWAMP WHITE B&B 2 1/2 INCH CAL	2.000 EACH		.		.
7045	632.0101 TREES (SPECIES, ROOT, SIZE) 0015. OAK, BURR B&B 2 1/2 INCH CAL	3.000 EACH		.		.
7050	632.0101 TREES (SPECIES, ROOT, SIZE) 0017. LOCUST, BLACK PURPLE ROBE BLACK 1 3/4 - 2 INCH CAL	1.000 EACH		.		.
7055	632.0101 TREES (SPECIES, ROOT, SIZE) 0019. BASSWOOD, AMERICAN 1 3/4 - 2 INCH CAL	2.000 EACH		.		.
7060	632.0101 TREES (SPECIES, ROOT, SIZE) 0021. ELM, JEFFERSON 1 3/4 - 2 INCH CAL	4.000 EACH		.		.
7065	632.0101 TREES (SPECIES, ROOT, SIZE) 0023. ELM, ACCOLADE 1 3/4 - 2 INCH CAL	3.000 EACH		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
7070	632.0101 TREES (SPECIES, ROOT, SIZE) 0025. CRABAPPLE, PRAIRIFIRE B&B 1 3/4 - 2 INCH CAL	5.000 EACH		.		.
7075	632.0101 TREES (SPECIES, ROOT, SIZE) 0027. CRABAPPLE, ROBINSON B&B 1 3/4 - 2 INCH CAL	9.000 EACH		.		.
7080	632.0101 TREES (SPECIES, ROOT, SIZE) 0029. HAWTHORN, THORNLESS COCKSPUR B&B 1 3/4 - 2 INCH CAL	3.000 EACH		.		.
7085	632.0101 TREES (SPECIES, ROOT, SIZE) 0031. REDCEDAR, EASTERN B&B 5' HT	7.000 EACH		.		.
7090	632.0101 TREES (SPECIES, ROOT, SIZE) 0033. SPRUCE, NORWAY B&B 5' HT	6.000 EACH		.		.
7095	632.0101 TREES (SPECIES, ROOT, SIZE) 0035. SPRUCE, WHITE B&B 6' HT	15.000 EACH		.		.
7100	632.0101 TREES (SPECIES, ROOT, SIZE) 0037. DOGWOOD, CORNELIANCHERRY 1 1/2 INCH CAL	9.000 EACH		.		.
7105	SPV.0060 SPECIAL 0153. SIGN SUPPORT SPECIAL MOUNTING	2.000 EACH		.		.
7110	SPV.0060 SPECIAL 5014. BETONITE TRENCH DAM	2.000 EACH		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
7115	SPV.0060 SPECIAL 5106. ABANDONING MMSD SANITARY MANHOLE	1.000 EACH		.		.
7120	SPV.0060 SPECIAL 5109. MMSD SANITARY SEWER MANHOLE, 48- INCH	1.000 EACH		.		.
7125	SPV.0060 SPECIAL 5110. MMSD SANITARY MANYHOLE VACUUM TEST	1.000 EACH		.		.
7130	SPV.0090 SPECIAL 5013. DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY	71.000 LF		.		.
7135	SPV.0090 SPECIAL 5014. STEEL CASING W/DUCTILE IRON 16- INCH CARRIER W/BACKFILL SLURRY	275.000 LF		.		.
7140	SPV.0090 SPECIAL 5120. ABANDONING SANITARY SEWER, 24-INCH	184.000 LF		.		.
	SECTION 0001 TOTAL					.

SECTION 0002 B-40-855 OPTION A
ALT GROUP AA1

5430	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.
5435	209.0100 BACKFILL GRANULAR	40.000 CY		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5440	502.0100 CONCRETE MASONRY BRIDGES **P**	951.000 CY		.		.
5445	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	214,290.000 LB		.		.
5450	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	200,370.000 LB		.		.
5455	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF		.		.
5460	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0001. B-40-855	1,295.000 SF		.		.
5465	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	5,706.000 DOL	1.00000		5706.00	
5470	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	7.000 EACH		.		.
5475	SPV.0060 SPECIAL 4171. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 98.43-IN	7.000 EACH		.		.
5480	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	28.000 HRS		.		.
5485	SPV.0090 SPECIAL 4460. DRILLED FOUNDATION SHAFT 98.43-INCH **P**	495.000 LF		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5490	SPV.0105 SPECIAL 4510. TRIAL DRILLED FOUNDATION SHAFT 98.43-INCH	LUMP	LUMP			.
	SECTION 0002 TOTAL					.
	SECTION 0003 B-40-855 OPTION B ALT GROUP AA2					
5495	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.
5500	209.0100 BACKFILL GRANULAR	341.000 CY		.		.
5505	502.0100 CONCRETE MASONRY BRIDGES **P**	1,100.000 CY		.		.
5510	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	188,970.000 LB		.		.
5515	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	203,090.000 LB		.		.
5520	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF		.		.
5525	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0001. B-40-855	1,295.000 SF		.		.
5530	550.2168 PILING CIP CONCRETE 16 X 0.50-INCH	2,100.000 LF		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5535	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	6,600.000 DOL	1.00000		6600.00	
5540	SPV.0060 SPECIAL 4110. PILE DYNAMIC ANALYZER (PDA) TESTING	2.000 EACH	.		.	
5545	SPV.0060 SPECIAL 4115. PILE DYNAMIC ANALYZER (PDA) RESTRIKES	2.000 EACH	.		.	
5550	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	6.000 EACH	.		.	
5555	SPV.0060 SPECIAL 4171. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 98.43-IN	6.000 EACH	.		.	
5560	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	24.000 HRS	.		.	
5565	SPV.0090 SPECIAL 4460. DRILLED FOUNDATION SHAFT 98.43-INCH **P**	400.000 LF	.		.	
5570	SPV.0105 SPECIAL 4510. TRIAL DRILLED FOUNDATION SHAFT 98.43-INCH	LUMP	LUMP		.	
	SECTION 0003 TOTAL				.	
	TOTAL BID				.	

Wisconsin Department of Transportation

August 19, 2014

Division of Transportation Systems Development
Bureau of Project Development
4802 Sheboygan Avenue, Rm 601
P O Box 7916
Madison, WI 53707-7916

Telephone: (608) 266-1631
Facsimile (FAX): (608) 266-8459

NOTICE TO ALL CONTRACTORS:

Proposal #01: **1060-33-80, WISC 2014 314**
Zoo IC – Zoo Interchange Phase 1
Lincoln – Bluemound, 121st to 70th
USH 45
Milwaukee

Letting of August 26, 2014

This is Addendum No. 3, which provides for the following:

Special Provisions

Revised Special Provisions	
Article No.	Description
78	QMP Drilled Shafts.
380	Adler Water Booster Station, Item SPV.0105.5000

Added Special Provisions	
Article No.	Description
420	Luminaires Utility LED B, Item 659.1120; Luminaires Utility LED D, Item 659.1130

Schedule of Items

Added Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
608.0442	Storm Sewer Pipe Reinforced Concrete Class IV 42-Inch	LF	0	677	677

Plan Sheets

Revised Plan Sheets	
Plan Sheet	Plan Sheet Title (brief description of changes to sheet)
261-265,268, 270-271	Revised AASHTO standards note
1645	Added storm sewer item

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

Sincerely,

Mike Coleman

Proposal Development Specialist
Proposal Management Section

ADDENDUM NO. 3

1060-33-80

August 19, 2014

Special Provisions

78. QMP Drilled Shafts.

Replace the third paragraph beginning with, "Fine and course aggregate shall conform…" under **B.1 Concrete Mix Physical Requirements** to the following:

Fine and course aggregate shall conform to the requirements of subsection 501.2.5 of the standard specifications except as modified herein:

Fine aggregate shall conform to the following gradation requirements:

Sieve Size:	Percent Passing (by weight)
3/8" (9.5 mm)	100
No. 4 (4.75 mm)	90 – 100
No. 16 (1.18 mm)	45 – 85
No. 50 (300 mm)	5 – 30
No. 100 (150 um)	0 – 10
No. 200 (75 um)	0 – 3.5

Coarse aggregates shall conform to the following gradation requirements:

Sieve Size:	Percent Passing (by weight)
1/2" (12.7 mm)	100
3/8" (9.5 mm)	85 – 100
No. 4 (4.75 mm)	10 – 30
No.8 (2.36 mm)	0 – 10
No. 16 (1.18 mm)	0 – 5
No. 200 (75 um)	0 – 1.5

380. Adler Water Booster Station, Item SPV.0105.5000.

Delete section **B.1 Booster Pump Station** and replace with the following:

B.1 Booster Pump Station
The booster pumping station manufacturer shall be Engineered Fluid, Inc., Centralia, IL; Gorman-Rupp Company, Mansfield, OH; Precision Systems, Calumet City, IL; USEMCO, Inc., Tomah, WI or equal.

420. Luminaires Utility LED B, Item 659.1120; Luminaires Utility LED D, Item 659.1130.

Supplement standard spec 659.2 with the following:

(2) The luminaire shall be equipped with a 10KV surge protection. Test surge protection in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.42.2 scenario 1 category C high exposure 10KV/10VA waveforms.

(3) LED driver shall be a Zitanium Continuous Lumen Output (CLO) driver. Setting shall be 0.80.

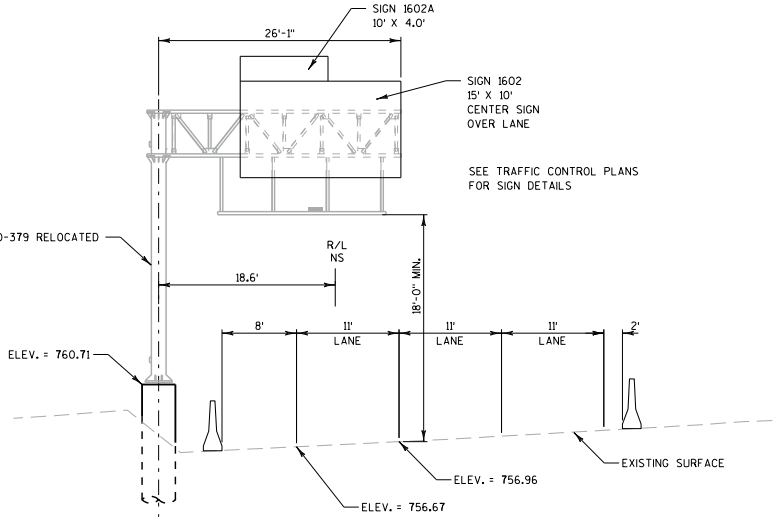
(4) Furnish each luminaire with an ANSI C136.40 compliant, 5-prong, locking type, photo control receptacle. Furnish and install a rain tight shorting cap.

(5) Furnish shop drawings as specified in 506.3.2, except submit 5 copies with the materials list. Ensure the drawings contain sufficient detail to allow satisfactory review and show the dimensions of all equipment shown in the plans.

Schedule of Items
Attached, dated August 19, 2014, are the revised Schedule of Items Pages 110 – 113.

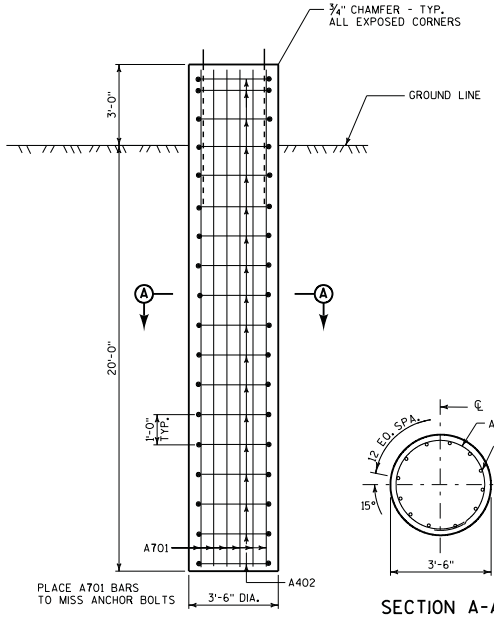
Plan Sheets
The following 8½ x 11-inch sheets are attached and made part of the plans for this proposal:
Revised: 261-265,268,270-271,1645

END OF ADDENDUM

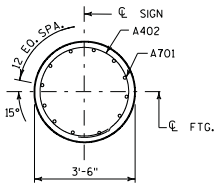


ELEVATION

(LOOKING SOUTH)
STA 327NS+18



ELEVATION

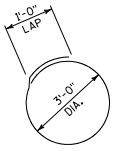


SECTION A-A

NOTE:
THE FIRST OR FIRST TWO DIGITS OF A
BAR MARK SIGNIFIES THE BAR SIZE.

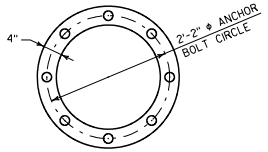
BILL OF BARS

BAR MARK	COAT	NO. REQ'D	LENGTH	BENT	CUT. DIAG.	BUN-DLE	LOCATION
A701		12	22'-7"				FOOTING - COLUMN/TOP
A402		23	10'-6"	X			FOOTING - COLUMN/TOP

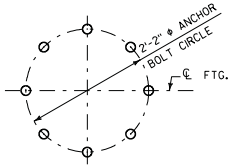


A402

Addendum No. 3
ID 1060-33-80
Revised Sheet 261
August 19, 2014



TOP VIEW OF TOP &
BOTTOM TEMPLATES



GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

PROVIDE IDENTIFICATION PLAQUE, INCIDENTAL TO "OVERHEAD SIGN SUPPORT, S-40-379". FABRICATE IN ACCORDANCE WITH S.D.D. "STRUCTURE IDENTIFICATION PLAQUES, SIGN BRIDGES & OVERHEAD SIGN SUPPORT".

MOUNTING BRACKETS FOR SIGNS SHALL BE PER APPROVED PRODUCT LIST.

ELEVATIONS ARE IN FEET UNLESS OTHERWISE SHOWN OR NOTED.

FOR JUNCTION BOXES, WIRING REQUIREMENTS, AND ELECTRIC SERVICE, SEE LIGHTING AND FTMS PLANS. PROVIDE GROUNDING OF OVERHEAD SIGN SUPPORTS PER S.D.D. "SIGN BRIDGE STRUCTURE GROUNDING".

ALL BARS CONTAINED ENTIRELY IN BELOW-GRADE BASES ARE TO BE UNCOATED REINFORCING STEEL. ALL OTHER BARS, INCLUDING BARS THAT ARE PARTIALLY EMBEDDED IN BASES BUT EXTEND OUTSIDE THE BASE INTO AN ABOVE-GRADE PEDESTAL, ARE TO BE EPOXY COATED.

THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION OF THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE.

CONTRACTOR SHALL SUBMIT DRAWINGS OF OVERHEAD SIGN SUPPORT AND DESIGN CALCULATIONS TO THE PROJECT ENGINEER AND TRAFFIC OPERATIONS CENTER FOR APPROVAL.

CONTRACTOR SHALL SHOW SIGNS ON SHOP DRAWINGS.

SIZE THE ANCHOR BOLT/TEMPLATE ASSEMBLY TO FIT WITHIN THE BAR CAGE OF THE FOOTING BASE IN ADDITION TO MEETING ALL APPLICABLE DESIGN REQUIREMENTS FOR THE DESIGN OF THE UPRIGHT BASE CONNECTION.

SIGNS OR BLANKS SHALL BE INSTALLED ON THE OVERHEAD SIGN SUPPORT AT THE TIME OF ERECTION. BLANKS, IF USED, SHALL BE OF THE SAME SIZE AND LOCATION AS PERMANENT SIGNS.

MOVING SIGN BRIDGE CANTILEVERED S-40-379 INCLUDES HORIZONTAL TRUSS, VERTICAL STEEL COLUMN AND ANCHOR ASSEMBLIES. LIGHTING IS NOT REQUIRED AT NEW LOCATION.

ALLOWABLE DESIGN STRESSES

CONCRETE MASONRY ——— f'c=3,500 P.S.I.
HIGH STRENGTH BAR STEEL REINFORCEMENT, GRADE 60 ——— fy=60,000 P.S.I.
ANCHOR BOLTS ASTM F1554 GRADE 55 ——— fy=55,000 P.S.I.

ESTIMATED QUANTITIES (1 FTG.)

SIGN SUPPORTS CONCRETE MASONRY ——— 9 C.Y.
SIGN SUPPORTS STEEL REINFORCEMENT HS ——— 715 LB.

DESIGN DATA

DESIGN SIGN AREA (CONTRACTOR DESIGNED)
MAXIMUM SIGN DEPTH (CONTRACTOR DESIGNED)

3 DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9.

DEAD LOAD - WT. OF SIGN, SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS.
LIVE LOAD - SINGLE LINE LOAD OF 500 LBS. DISTRIBUTED OVER 2'-0" OF CATWALK.
ICE LOAD - 3 PSF TO ONE FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 MPH (3-SEC. GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

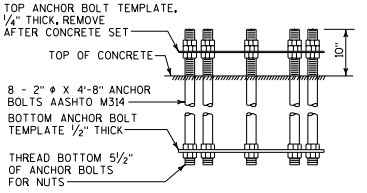
GROUP LOADS	% OF ALLOWABLE STRESS
I. DEAD	100
II. DEAD + WIND	133
III. DEAD + ICE + ½WIND	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 PSF.

FOUNDATION DATA

THE FOLLOWING ASSUMPTIONS WERE USED FOR THE DESIGN OF THE CONCRETE BASE INDICATED IN S.D.D. "36" DIAMETER FULL SPAN OVERHEAD SIGN SUPPORT BASE". IF VARIATIONS IN THE ASSUMED DESIGN PARAMETERS ARE FOUND DURING CONSTRUCTION, NOTIFY THE PROJECT ENGINEER FOR REQUIRED MODIFICATION TO THE FOUNDATION SYSTEM.

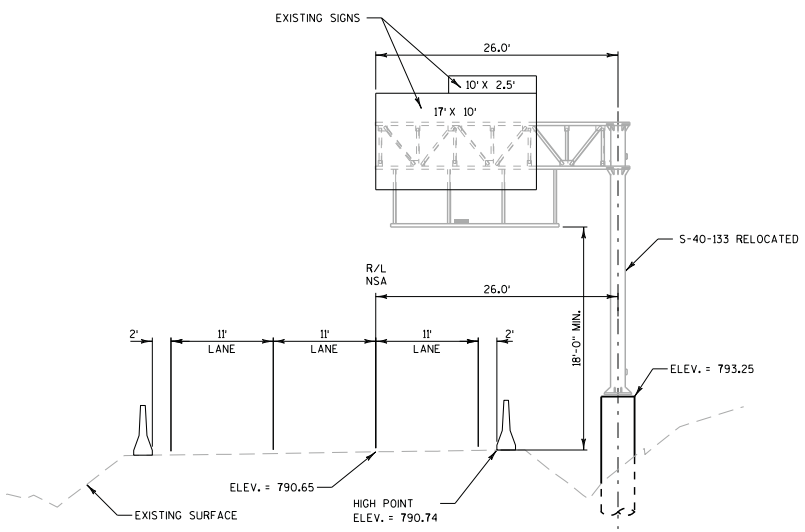
ALLOWABLE SOIL BEARING PRESSURE = 3000 PSF
ALLOWABLE SKIN FRICTION = 500 PSF
ALLOWABLE COHESION = 1000 PSF
ASSUMED FRICTION ANGLE = 30 DEGREES



ANCHOR BOLT DETAILS

MOVING SIGN BRIDGE CANTILEVERED S-40-379

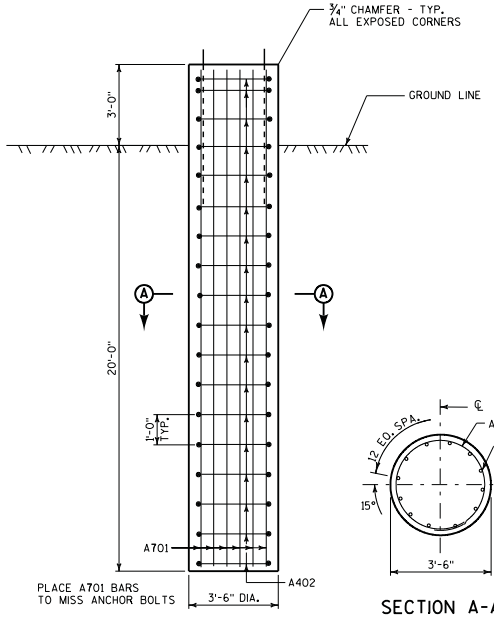
PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	CONSTRUCTION DETAILS	SHEET 261	E



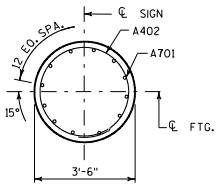
ELEVATION

(LOOKING NORTH)

STA 32NSA+70



ELEVATION

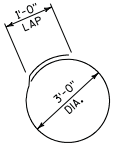


SECTION A-A

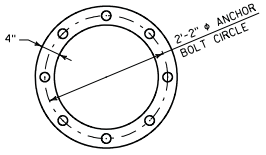
NOTE:
THE FIRST OR FIRST TWO DIGITS OF A BAR MARK SIGNIFIES THE BAR SIZE.

BILL OF BARS

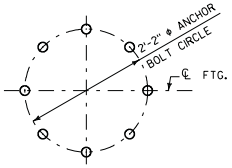
BAR MARK	COAT	NO. REQ'D	LENGTH	BENT	CUT. DIAG.	BUN-DLE	LOCATION
A701		12	22'-7"				FOOTING - COLUMN/TOP
A402		23	10'-6"	X			FOOTING - COLUMN/TOP



A402



TOP VIEW OF TOP & BOTTOM TEMPLATES



Addendum No. 3
ID 1060-33-80
Revised Sheet 262
August 19, 2014

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

PROVIDE IDENTIFICATION PLAQUE, INCIDENTAL TO "OVERHEAD SIGN SUPPORT, S-40-133". FABRICATE IN ACCORDANCE WITH S.D.D. "STRUCTURE IDENTIFICATION PLAQUES, SIGN BRIDGES & OVERHEAD SIGN SUPPORT".

MOUNTING BRACKETS FOR SIGNS SHALL BE PER APPROVED PRODUCT LIST.

ELEVATIONS ARE IN FEET UNLESS OTHERWISE SHOWN OR NOTED.

FOR JUNCTION BOXES, WIRING REQUIREMENTS, AND ELECTRIC SERVICE, SEE LIGHTING AND FTMS PLANS. PROVIDE GROUNDING OF OVERHEAD SIGN SUPPORTS PER S.D.D. "SIGN BRIDGE STRUCTURE GROUNDING".

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CONTRACTOR SHALL SHOW SIGNS ON SHOP DRAWINGS.

SIZE THE ANCHOR BOLT/TEMPLATE ASSEMBLY TO FIT WITHIN THE BAR CAGE OF THE FOOTING BASE IN ADDITION TO MEETING ALL APPLICABLE DESIGN REQUIREMENTS FOR THE DESIGN OF THE UPRIGHT BASE CONNECTION.

SIGNS OR BLANKS SHALL BE INSTALLED ON THE OVERHEAD SIGN SUPPORT AT THE TIME OF ERECTION. BLANKS, IF USED, SHALL BE OF THE SAME SIZE AND LOCATION AS PERMANENT SIGNS.

MOVING SIGN BRIDGE CANTILEVERED S-40-133 INCLUDES HORIZONTAL TRUSS, VERTICAL STEEL COLUMN AND ANCHOR ASSEMBLIES. LIGHTING IS NOT REQUIRED AT NEW LOCATION.

ALLOWABLE DESIGN STRESSES

CONCRETE MASONRY ——— f'c=3,500 P.S.I.
HIGH STRENGTH BAR STEEL REINFORCEMENT, GRADE 60 ——— fy=60,000 P.S.I.
ANCHOR BOLTS ASTM F1554 GRADE 55 ——— fy=55,000 P.S.I.

ESTIMATED QUANTITIES (1 FTG.)

SIGN SUPPORTS CONCRETE MASONRY ——— 9 C.Y.
SIGN SUPPORTS STEEL REINFORCEMENT HS ——— 715 LB.

DESIGN DATA

DESIGN SIGN AREA (CONTRACTOR DESIGNED)
MAXIMUM SIGN DEPTH (CONTRACTOR DESIGNED)

3 DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9.

DEAD LOAD - WT. OF SIGN, SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS.
LIVE LOAD - SINGLE LINE LOAD OF 500 LBS. DISTRIBUTED OVER 2'-0" OF CATWALK.
ICE LOAD - 3 PSF TO ONE FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 MPH (3-SEC. GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

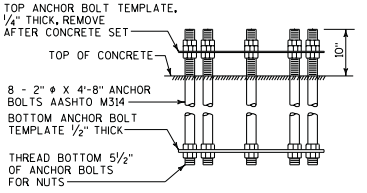
GROUP LOADS	% OF ALLOWABLE STRESS
I. DEAD	100
II. DEAD + WIND	133
III. DEAD + ICE + ½WIND	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 PSF.

FOUNDATION DATA

THE FOLLOWING ASSUMPTIONS WERE USED FOR THE DESIGN OF THE CONCRETE BASE INDICATED IN S.D.D. "36" DIAMETER FULL SPAN OVERHEAD SIGN SUPPORT BASE". IF VARIATIONS IN THE ASSUMED DESIGN PARAMETERS ARE FOUND DURING CONSTRUCTION, NOTIFY THE PROJECT ENGINEER FOR REQUIRED MODIFICATION TO THE FOUNDATION SYSTEM.

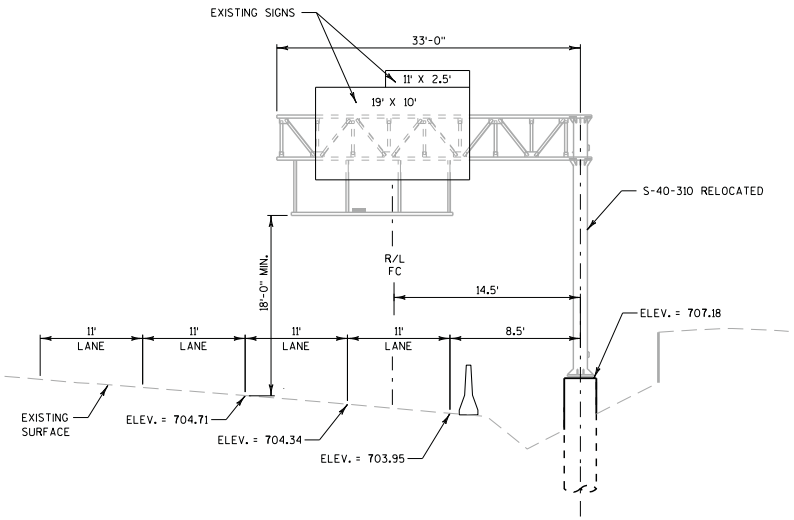
ALLOWABLE SOIL BEARING PRESSURE = 3000 PSF
ALLOWABLE SKIN FRICTION = 500 PSF
ALLOWABLE COHESION = 1000 PSF
ASSUMED FRICTION ANGLE = 30 DEGREES



ANCHOR BOLT DETAILS

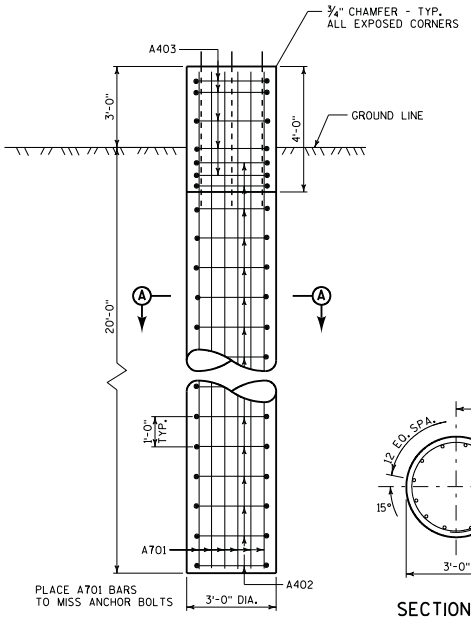
MOVING SIGN BRIDGE CANTILEVERED S-40-133

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	CONSTRUCTION DETAILS	SHEET 262	E



ELEVATION

(LOOKING EAST)
STA 827FC+84



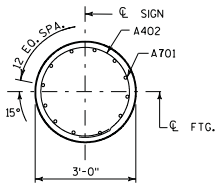
ELEVATION

NOTE:
THE FIRST OR FIRST TWO DIGITS OF A BAR MARK SIGNIFIES THE BAR SIZE.

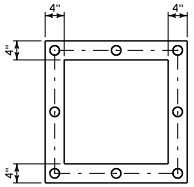
BILL OF BARS

BAR MARK	COAT	NO. REQ'D	LENGTH	BENT	CUT. DIAG.	BUN-DLE	LOCATION
A701		12	22'-7"				SHAFT VERTICAL
A402		21	8'-10"	X			SHAFT TIE
A403		5	10'-9"	X			TOP BLOCK TIE
A404		4	3'-6"				TOP BLOCK VERTICAL





SECTION A-A



TOP VIEW OF TOP & BOTTOM TEMPLATES

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

PROVIDE IDENTIFICATION PLAQUE, INCIDENTAL TO "OVERHEAD SIGN SUPPORT, S-40-310". FABRICATE IN ACCORDANCE WITH S.D.D. "STRUCTURE IDENTIFICATION PLAQUES, SIGN BRIDGES & OVERHEAD SIGN SUPPORT".

MOUNTING BRACKETS FOR SIGNS SHALL BE PER APPROVED PRODUCT LIST.

ELEVATIONS ARE IN FEET UNLESS OTHERWISE SHOWN OR NOTED.

FOR JUNCTION BOXES, WIRING REQUIREMENTS, AND ELECTRIC SERVICE, SEE LIGHTING AND FTMS PLANS. PROVIDE GROUNDING OF OVERHEAD SIGN SUPPORTS PER S.D.D. "SIGN BRIDGE STRUCTURE GROUNDING".

ALL BARS CONTAINED ENTIRELY IN BELOW-GRADE BASES ARE TO BE UNCOATED REINFORCING STEEL. ALL OTHER BARS, INCLUDING BARS THAT ARE PARTIALLY EMBEDDED IN BASES BUT EXTEND OUTSIDE THE BASE INTO AN ABOVE-GRADE PEDESTAL, ARE TO BE EPOXY COATED.

THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION OF THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE.

CONTRACTOR SHALL SUBMIT DRAWINGS OF OVERHEAD SIGN SUPPORT AND DESIGN CALCULATIONS TO THE PROJECT ENGINEER AND TRAFFIC OPERATIONS CENTER FOR APPROVAL.

CONTRACTOR SHALL SHOW SIGNS ON SHOP DRAWINGS.

SIZE THE ANCHOR BOLT/TEMPLATE ASSEMBLY TO FIT WITHIN THE BAR CAGE OF THE FOOTING BASE IN ADDITION TO MEETING ALL APPLICABLE DESIGN REQUIREMENTS FOR THE DESIGN OF THE UPRIGHT BASE CONNECTION.

SIGNS OR BLANKS SHALL BE INSTALLED ON THE OVERHEAD SIGN SUPPORT AT THE TIME OF ERECTION. BLANKS, IF USED, SHALL BE OF THE SAME SIZE AND LOCATION AS PERMANENT SIGNS.

MOVING SIGN BRIDGE CANTILEVERED S-40-310 INCLUDES HORIZONTAL TRUSS, VERTICAL STEEL COLUMN AND ANCHOR ASSEMBLIES. LIGHTING IS NOT REQUIRED AT NEW LOCATION.

ALLOWABLE DESIGN STRESSES

CONCRETE MASONRY ——— f'c=3,500 P.S.I.
HIGH STRENGTH BAR STEEL REINFORCEMENT, GRADE 60 ——— fy=60,000 P.S.I.
ANCHOR BOLTS ASSHTO M314 GRADE 55 ——— fy=55,000 P.S.I.

ESTIMATED QUANTITIES (1 FTG.)

SIGN SUPPORTS CONCRETE MASONRY ——— 6.5 C.Y.
SIGN SUPPORTS STEEL REINFORCEMENT HS ——— 725 LB.

DESIGN DATA

DESIGN SIGN AREA (CONTRACTOR DESIGNED)
MAXIMUM SIGN DEPTH (CONTRACTOR DESIGNED)

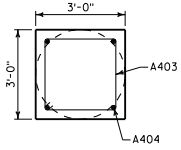
3 DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9.

DEAD LOAD - WT. OF SIGN, SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS.
LIVE LOAD - SINGLE LINE LOAD OF 500 LBS. DISTRIBUTED OVER 2'-0" OF CATWALK.
ICE LOAD - 3 PSF TO ONE FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 MPH (3-SEC. GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

GROUP LOADS	% OF ALLOWABLE STRESS
I. DEAD	100
II. DEAD + WIND	133
III. DEAD + ICE + ½WIND	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 PSF.



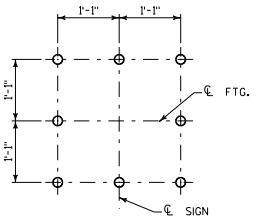
PLAN

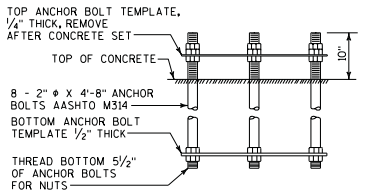
Addendum No. 3
ID 1060-33-80
Revised Sheet 263
August 19, 2014

FOUNDATION DATA

THE FOLLOWING ASSUMPTIONS WERE USED FOR THE DESIGN OF THE CONCRETE BASE INDICATED IN S.D.D. "36" DIAMETER FULL SPAN OVERHEAD SIGN SUPPORT BASE". IF VARIATIONS IN THE ASSUMED DESIGN PARAMETERS ARE FOUND DURING CONSTRUCTION, NOTIFY THE PROJECT ENGINEER FOR REQUIRED MODIFICATION TO THE FOUNDATION SYSTEM.

ALLOWABLE SOIL BEARING PRESSURE = 3000 PSF
ALLOWABLE SKIN FRICTION = 500 PSF
ALLOWABLE COHESION = 1000 PSF
ASSUMED FRICTION ANGLE = 30 DEGREES

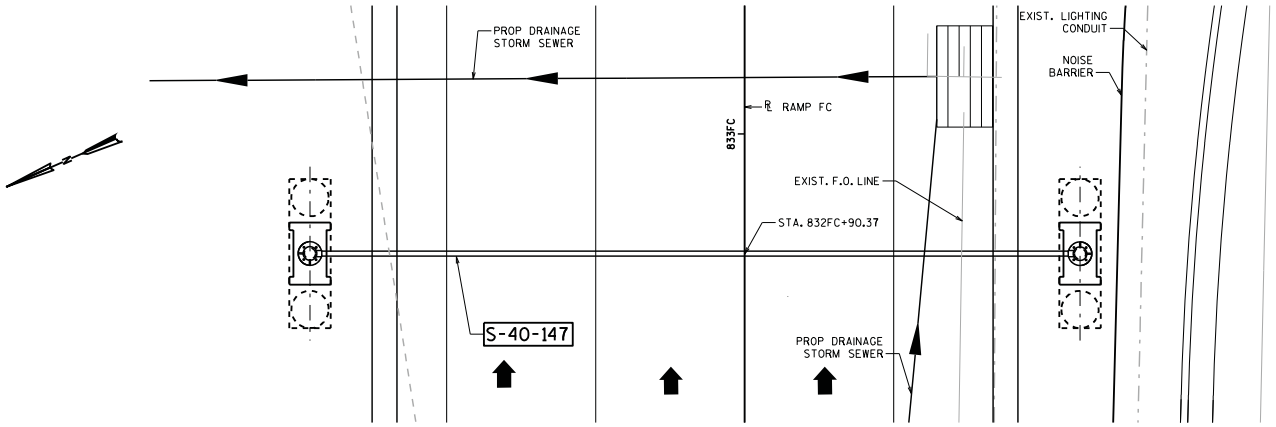




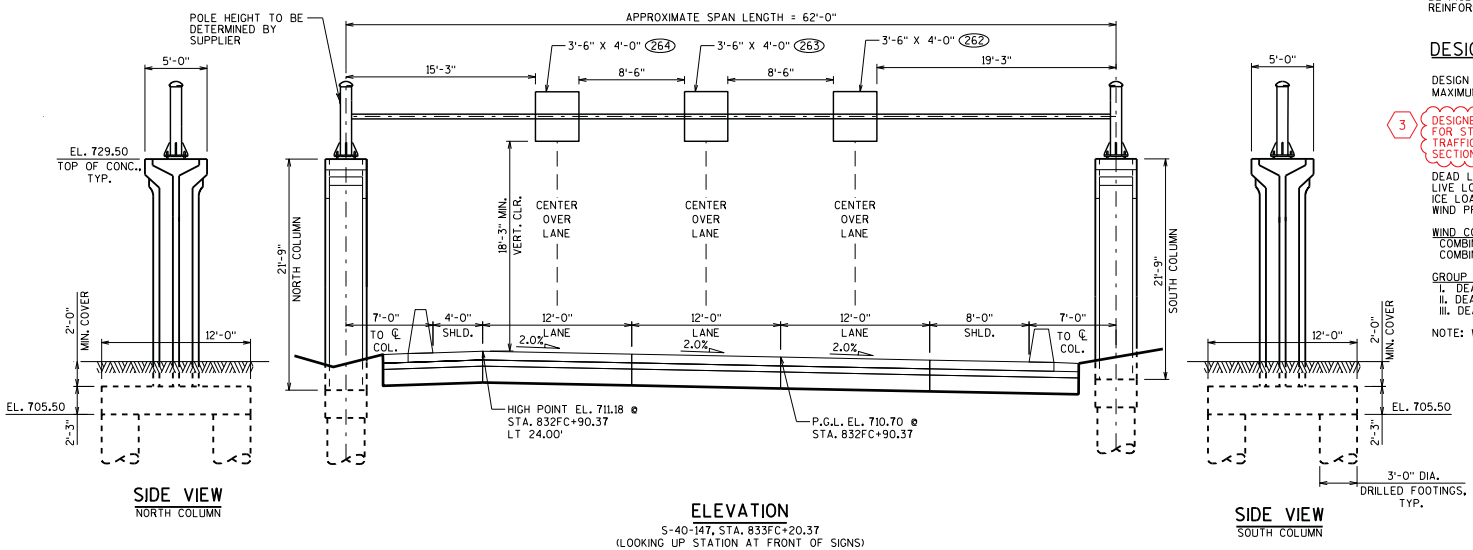
MOVING SIGN BRIDGE CANTILEVERED S-40-310

ANCHOR BOLT DETAILS

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	CONSTRUCTION DETAILS	SHEET 263	E



PLAN



SIDE VIEW
NORTH COLUMN

ELEVATION
S-40-147, STA. 833FC+20.37
(LOOKING UP STATION AT FRONT OF SIGNS)

SIDE VIEW
SOUTH COLUMN

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

OVERHEAD SIGN SUPPORT SHALL BE A MONOTUBE SYSTEM.

PROVIDE IDENTIFICATION PLAQUE, INCIDENTAL TO "OVERHEAD SIGN SUPPORT, S-40-147". FABRICATE IN ACCORDANCE WITH S.D.D. "STRUCTURE IDENTIFICATION PLAQUES, SIGN BRIDGES & OVERHEAD SIGN SUPPORT".

CENTER SIGNS VERTICALLY ON MONOTUBE.

ELEVATIONS ARE IN FEET UNLESS OTHERWISE SHOWN OR NOTED.

FOR JUNCTION BOXES, WIRING REQUIREMENTS, AND ELECTRIC SERVICE, SEE LIGHTING AND FTMS PLANS. PROVIDE GROUNDING OF OVERHEAD SIGN SUPPORTS PER S.D.D. "SIGN BRIDGE STRUCTURE GROUNDING".

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CONTRACTOR SHALL SHOW SIGNS ON SHOP DRAWINGS.

SIZE THE ANCHOR BOLT/TEMPLATE ASSEMBLY TO FIT WITHIN THE BAR CAGE OF THE COLUMN IN ADDITION TO MEETING ALL APPLICABLE DESIGN REQUIREMENTS FOR THE DESIGN OF THE UPRIGHT BASE CONNECTION.

SIGNS OR BLANKS SHALL BE INSTALLED ON THE OVERHEAD SIGN SUPPORT AT THE TIME OF ERECTION. BLANKS, IF USED, SHALL BE OF THE SAME SIZE AND LOCATION AS PERMANENT SIGNS.

THE ANCHORAGE ASSEMBLIES AND ALL ITEMS ABOVE CONCRETE COLUMNS SHALL BE INCLUDED IN THE OVERHEAD SIGN SUPPORT S-40-148. ALL CONCRETE AND REINFORCEMENT ITEMS TO BE INCLUDED IN CONCRETE SIGN SUPPORT PAY ITEMS.

DESIGN DATA

DESIGN SIGN AREA (CONTRACTOR DESIGNED)
MAXIMUM SIGN DEPTH (CONTRACTOR DESIGNED)

3 DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9.

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ICE LOAD - 3 PSF TO ONE FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 MPH (3-SEC. GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

GROUP LOADS	% OF ALLOWABLE STRESS
I. DEAD	100
II. DEAD + WIND	133
III. DEAD + ICE + ½WIND	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 PSF.

LEGEND

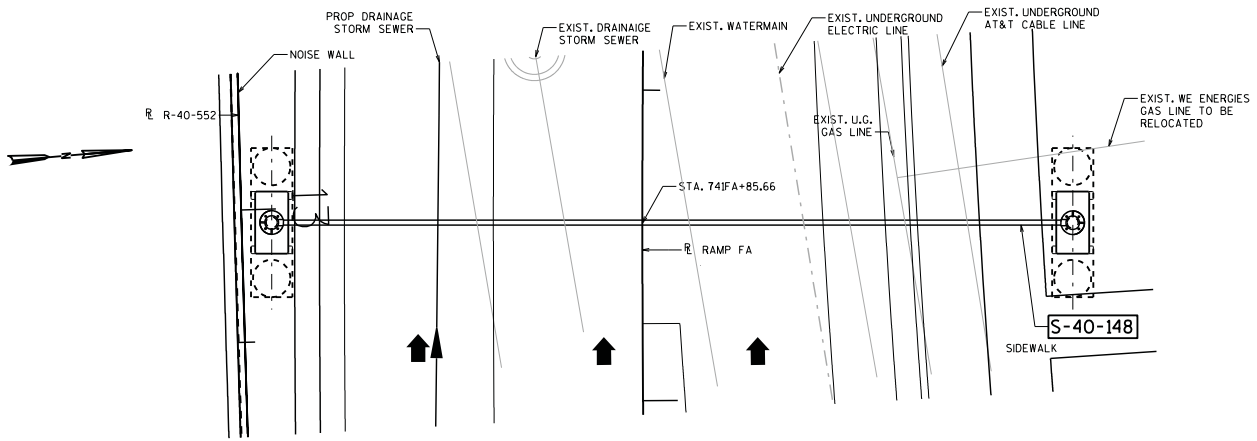
(XXX) SIGN NUMBERS (PERMANENT SIGNING PLAN)

S-40-147 TOTAL ESTIMATE OF QUANTITIES

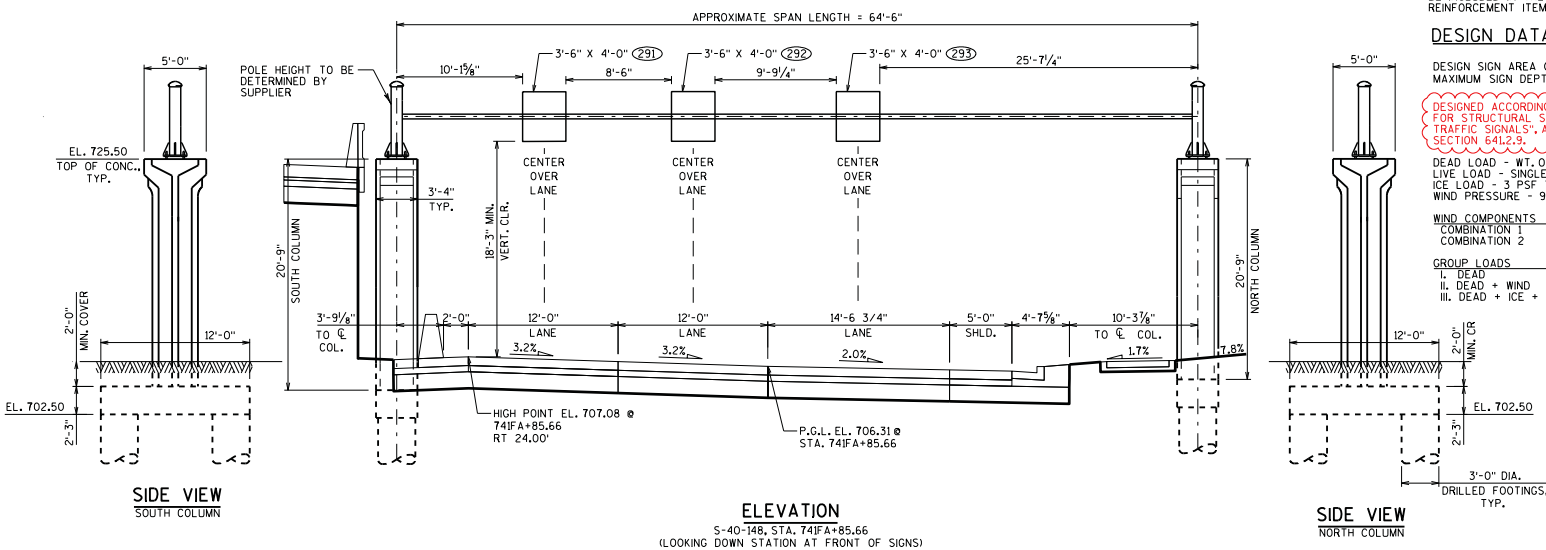
ITEM NUMBER	BID ITEM	UNIT	TOTAL
636.0100	SIGN SUPPORTS CONCRETE MASONRY	CY	53
636.1000	SIGN SUPPORTS STEEL REINFORCEMENT HS	LB	1,480
636.1500	SIGN SUPPORTS STEEL COATED REINFORCEMENT HS	LB	1,560
641.8100	OVERHEAD SIGN SUPPORTS S-40-147	LS	1

OVERHEAD SIGN SUPPORT S-40-147

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PLAN



SIDE VIEW
SOUTH COLUMN

ELEVATION
S-40-148, STA. 741FA+85.66
(LOOKING DOWN STATION AT FRONT OF SIGNS)

SIDE VIEW
NORTH COLUMN

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

OVERHEAD SIGN SUPPORT SHALL BE A MONOTUBE SYSTEM.

PROVIDE IDENTIFICATION PLAQUE, INCIDENTAL TO "OVERHEAD SIGN SUPPORT, S-40-148". FABRICATE IN ACCORDANCE WITH S.D.D. "STRUCTURE IDENTIFICATION PLAQUES, SIGN BRIDGES & OVERHEAD SIGN SUPPORT".

CENTER SIGNS VERTICALLY ON MONOTUBE.

ELEVATIONS ARE IN FEET UNLESS OTHERWISE SHOWN OR NOTED.

FOR JUNCTION BOXES, WIRING REQUIREMENTS, AND ELECTRIC SERVICE, SEE LIGHTING AND FTMS PLANS. PROVIDE GROUNDING OF OVERHEAD SIGN SUPPORTS PER S.D.D. "SIGN BRIDGE STRUCTURE GROUNDING".

ALL BARS CONTAINED ENTIRELY IN BELOW-GRADE BASES ARE TO BE UNCOATED REINFORCING STEEL. ALL OTHER BARS, INCLUDING BARS THAT ARE PARTIALLY EMBEDDED IN BASES BUT EXTEND OUTSIDE THE BASE INTO AN ABOVE-GRADE PEDESTAL, ARE TO BE EPOXY COATED.

THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION OF THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE.

CONTRACTOR SHALL SUBMIT DRAWINGS OF OVERHEAD SIGN SUPPORT AND DESIGN CALCULATIONS TO THE PROJECT ENGINEER AND TRAFFIC OPERATIONS CENTER FOR APPROVAL.

CONTRACTOR SHALL SHOW SIGNS ON SHOP DRAWINGS.

SIZE THE ANCHOR BOLT/TEMPLATE ASSEMBLY TO FIT WITHIN THE BAR CAGE OF THE COLUMN IN ADDITION TO MEETING ALL APPLICABLE DESIGN REQUIREMENTS FOR THE DESIGN OF THE UPRIGHT BASE CONNECTION.

SIGNS OR BLANKS SHALL BE INSTALLED ON THE OVERHEAD SIGN SUPPORT AT THE TIME OF ERECTION. BLANKS, IF USED, SHALL BE OF THE SAME SIZE AND LOCATION AS PERMANENT SIGNS.

THE ANCHORAGE ASSEMBLIES AND ALL ITEMS ABOVE CONCRETE COLUMNS SHALL BE INCLUDED IN THE OVERHEAD SIGN SUPPORT S-40-148. ALL CONCRETE AND REINFORCEMENT ITEMS TO BE INCLUDED IN CONCRETE SIGN SUPPORT PAY ITEMS.

DESIGN DATA

DESIGN SIGN AREA (CONTRACTOR DESIGNED)
MAXIMUM SIGN DEPTH (CONTRACTOR DESIGNED)

DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9. (3)

DEAD LOAD - WT. OF SIGN, SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS.
LIVE LOAD - SINGLE LINE LOAD OF 500 LBS. DISTRIBUTED OVER 2'-0" OF CATWALK.
ICE LOAD - 3 PSF TO ONE FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 MPH (3-SEC. GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

GROUP LOADS	% OF ALLOWABLE STRESS
I. DEAD	100
II. DEAD + WIND	133
III. DEAD + ICE + ½WIND	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 PSF.

LEGEND

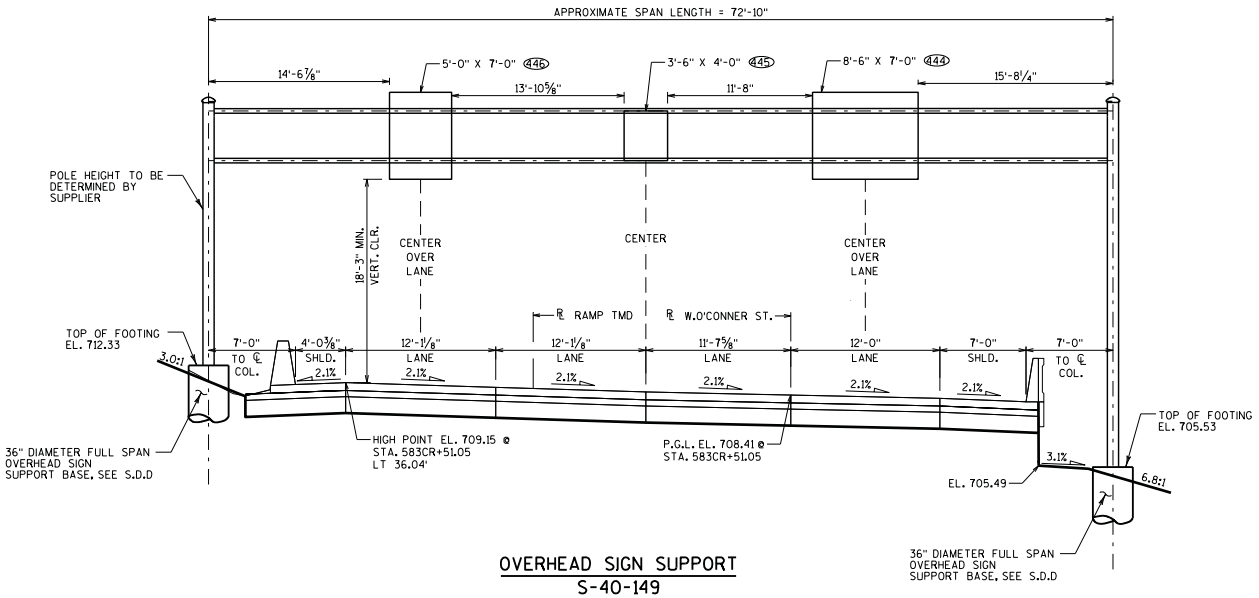
(xxx) SIGN NUMBERS (PERMANENT SIGNING PLAN)

S-40-148 TOTAL ESTIMATE OF QUANTITIES

ITEM NUMBER	BID ITEM	UNIT	TOTAL
636.0100	SIGN SUPPORTS CONCRETE MASONRY	CY	52
636.1000	SIGN SUPPORTS STEEL REINFORCEMENT HS	LB	1,480
636.1500	SIGN SUPPORTS STEEL COATED REINFORCEMENT HS	LB	1,500
641.8100	OVERHEAD SIGN SUPPORTS S-40-141	LS	1

OVERHEAD SIGN SUPPORT S-40-148

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OVERHEAD SIGN SUPPORT
S-40-149

RAMP TMD

STATION 583CR+50.00
LOOKING WEST

LEGEND

(xxx) SIGN NUMBERS (PERMANENT SIGNING PLAN)

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

OVERHEAD SIGN SUPPORT SHALL BE A 2-CHORD SYSTEM WITH A MINIMUM SPACING OF 4'-0" BETWEEN THE CENTERLINE OF ROUND CHORDS SEPARATED BY WEB MEMBERS CONNECTED BY GUSSET PLATES.

PROVIDE IDENTIFICATION PLAQUE, INCIDENTAL TO "OVERHEAD SIGN SUPPORT, S-40-149". FABRICATE IN ACCORDANCE WITH S.D.D. "STRUCTURE IDENTIFICATION PLAQUES, SIGN BRIDGES & OVERHEAD SIGN SUPPORT".

CENTER SIGNS VERTICALLY ON TRUSS.

I-BEAMS (W 5 X 3.7) FOR MOUNTING SIGNS ARE INCIDENTAL TO SIGNS. DO NOT PUT SLOTS IN I-BEAMS

ELEVATIONS ARE IN FEET UNLESS OTHERWISE SHOWN OR NOTED.

FOR JUNCTION BOXES, WIRING REQUIREMENTS, AND ELECTRIC SERVICE, SEE LIGHTING AND FTMS PLANS. PROVIDE GROUNDING OF OVERHEAD SIGN SUPPORTS PER S.D.D. "SIGN BRIDGE STRUCTURE GROUNDING".

ALL BARS CONTAINED ENTIRELY IN BELOW-GRADE BASES ARE TO BE UNCOATED REINFORCING STEEL. ALL OTHER BARS, INCLUDING BARS THAT ARE PARTIALLY EMBEDDED IN BASES BUT EXTEND OUTSIDE THE BASE INTO AN ABOVE-GRADE PEDESTAL, ARE TO BE EPOXY COATED.

THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION OF THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE.

CONTRACTOR SHALL SUBMIT DRAWINGS OF OVERHEAD SIGN SUPPORT AND DESIGN CALCULATIONS TO THE PROJECT ENGINEER AND TRAFFIC OPS SE REGION TOM HEYDEL FOR APPROVAL.

CONTRACTOR SHALL SHOW SIGNS ON SHOP DRAWINGS.

CONCRETE BASE (AND CONCRETE PEDESTAL IF REQUIRED) FOR SUPPORT OF STEEL COLUMNS ARE INCIDENTAL TO ITEM "OVERHEAD SIGN SUPPORT, S-40-436". DESIGN AND CONSTRUCT CONCRETE BASE IN ACCORDANCE WITH S.D.D. "36" DIAMETER FULL SPAN OVERHEAD SIGN SUPPORT BASE".

SIZE THE ANCHOR BOLT/TEMPLATE ASSEMBLY TO FIT WITHIN THE BAR CAGE OF THE FOOTING BASE IN ADDITION TO MEETING ALL APPLICABLE DESIGN REQUIREMENTS FOR THE DESIGN OF THE UPRIGHT BASE CONNECTION.

SIX ANCHOR RODS SHALL BE USED PER S.D.D

FOOTING IS INCIDENTAL TO OVERHEAD SIGN SUPPORT

SIGNS OR BLANKS SHALL BE INSTALLED ON THE OVERHEAD SIGN SUPPORT AT THE TIME OF ERECTION. BLANKS, IF USED, SHALL BE OF THE SAME SIZE AND LOCATION AS PERMANENT SIGNS.

DESIGN DATA

DESIGN SIGN AREA (CONTRACTOR DESIGNED)
MAXIMUM SIGN DEPTH (CONTRACTOR DESIGNED)

DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9. (3)

DEAD LOAD - WT. OF SIGN, SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS.
LIVE LOAD - SINGLE LINE LOAD OF 500 LBS. DISTRIBUTED OVER 2'-0" OF CATWALK.
ICE LOAD - 3 PSF TO ONE FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 MPH (3-SEC. GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

GROUP LOADS	% OF ALLOWABLE STRESS
I. DEAD	100
II. DEAD + WIND	133
III. DEAD + ICE + ½WIND	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 PSF.

FOUNDATION DATA

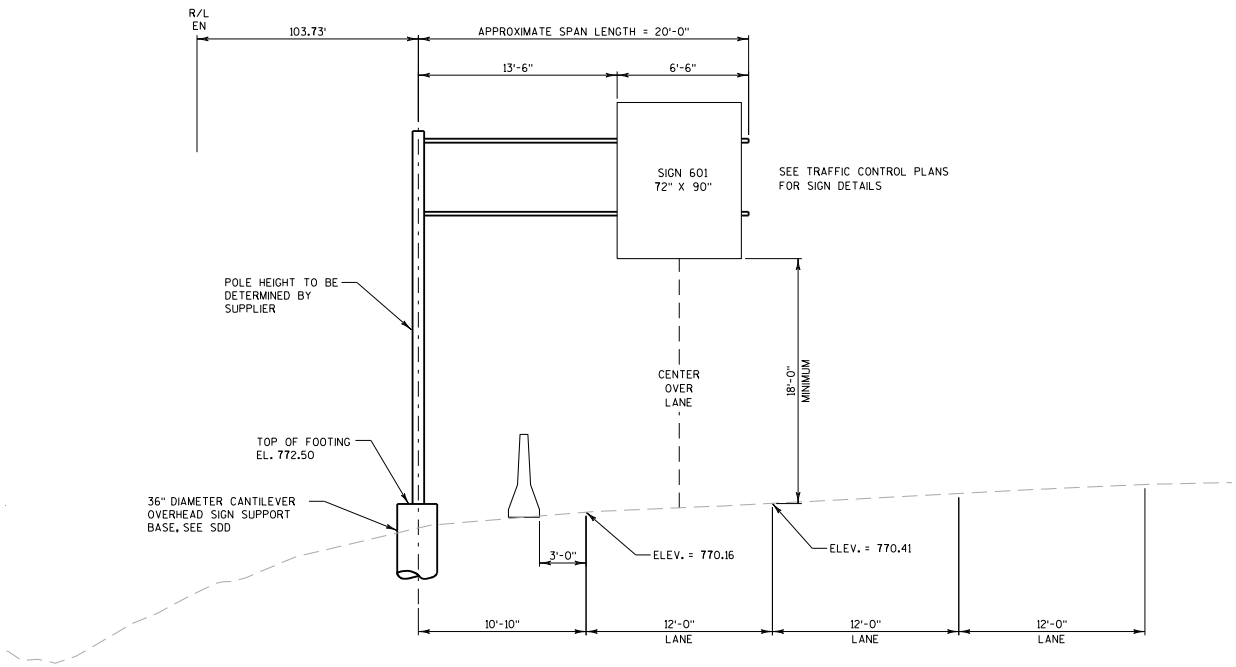
THE FOLLOWING ASSUMPTIONS WERE USED FOR THE DESIGN OF THE CONCRETE BASE INDICATED IN S.D.D. "36" DIAMETER FULL SPAN OVERHEAD SIGN SUPPORT BASE". IF VARIATIONS IN THE ASSUMED DESIGN PARAMETERS ARE FOUND DURING CONSTRUCTION, NOTIFY THE PROJECT ENGINEER FOR REQUIRED MODIFICATION TO THE FOUNDATION SYSTEM.

ALLOWABLE SOIL BEARING PRESSURE = 3000 PSF
ALLOWABLE SKIN FRICTION = 500 PSF
ALLOWABLE COHESION = 1000 PSF
ASSUMED FRICTION ANGLE = 30 DEGREES

OVERHEAD SIGN SUPPORT S-40-149

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ID 1060-33-80
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PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	CONSTRUCTION DETAILS	SHEET 268	E



GENERAL NOTES

DRAWINGS ARE NOT TO SCALE.

3 DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9.

DEAD LOAD - WT. OF SIGN AND SUPPORTING STRUCTURE.
ICE LOAD - 3 P.S.F. TO 1 FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 M.P.H. (3-SECOND GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

GROUP LOADS	% OF ALLOWABLE STRESS
1. DEAD	100
2. DEAD + WIND	133
3. DEAD + ICE + ½(WIND)	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 P.S.F.

THE SIGN STRUCTURES SHALL BE DESIGNED TO SUPPORT SIGNS AND SIGNALS SHOWN.

MOUNTING BRACKETS FOR SIGNS SHALL BE PER APPROVED PRODUCT LIST.

SUBMIT SHOP DRAWINGS OF OVERHEAD SIGN SUPPORT TO TRAFFIC OPS WISDOT TOM HEYDEL.

PROVIDE DESIGN CALCULATION.

SHOW SIGN ON SHOP DRAWINGS.

ID PLAQUE INCIDENTAL TO SIGN SUPPORT.

6 ANCHOR RODS SHALL BE USED PER SDD.

POLE HEIGHT TO BE DETERMINED BY SUPPLIER.

ALL ITEMS ASSOCIATED WITH SIGN BRIDGE INCLUDED IN BID ITEM "OVERHEAD SIGN SUPPORT S-40-995".

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ID 1060-33-80
Revised Sheet 270
August 19, 2014

OVERHEAD SIGN SUPPORT S-40-995

USH 45 NORTHBOUND
STATION 533EN+13, RT
LOOKING NORTH

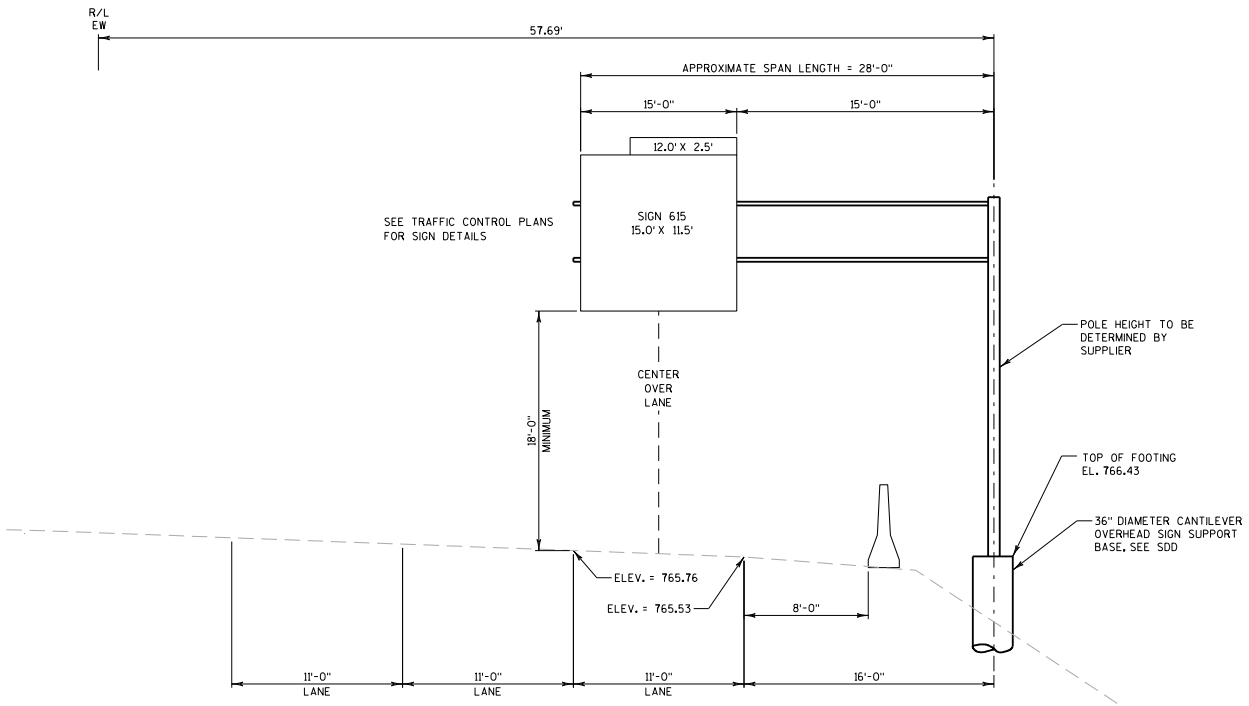
SIGN AND SIGN STRUCTURE TO REMAIN IN PLACE AT END OF CONTRACT

ALLOWABLE DESIGN STRESSES

CONCRETE MASONRY FC=3500 PSI
HIGH STRENGTH BAR STEEL REINFORCEMENT, GRADE 60 FY=60,000 PSI

FOUNDATION DATA

ALLOWABLE SOIL BEARING PRESSURE = 3000 PSF



OVERHEAD SIGN SUPPORT S-40-996

IH 94 EASTBOUND
STATION 170EW+00, RT
LOOKING EAST

SIGN AND SIGN STRUCTURE TO REMAIN
IN PLACE AT END OF CONTRACT

GENERAL NOTES

DRAWINGS ARE NOT TO SCALE.

3 DESIGNED ACCORDING TO A.A.S.H.T.O. "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS", AS NOTED IN WISDOT STANDARD SPECIFICATIONS SECTION 641.2.9.

DEAD LOAD - WT. OF SIGN AND SUPPORTING STRUCTURE.
ICE LOAD - 3 P.S.F. TO 1 FACE OF SIGN & AROUND SURFACE OF MEMBERS.
WIND PRESSURE - 90 M.P.H. (3-SECOND GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.

WIND COMPONENTS	NORMAL	TRANSVERSE
COMBINATION 1	1.0	0.2
COMBINATION 2	0.6	0.3

GROUP LOADS	% OF ALLOWABLE STRESS
1. DEAD	100
2. DEAD + WIND	133
3. DEAD + ICE + ½(WIND)	133

NOTE: WIND LOAD FOR GROUP 3 LOADING SHALL NOT BE LESS THAN 25 P.S.F.

THE SIGN STRUCTURES SHALL BE DESIGNED TO SUPPORT SIGNS AND SIGNALS SHOWN.

MOUNTING BRACKETS FOR SIGNS SHALL BE PER APPROVED PRODUCT LIST.

SUBMIT SHOP DRAWINGS OF OVERHEAD SIGN SUPPORT TO TRAFFIC OPS WISDOT TOM HEYDEL.

PROVIDE DESIGN CALCULATION.

SHOW SIGN ON SHOP DRAWINGS.

ID PLAQUE INCIDENTAL TO SIGN SUPPORT.

6 ANCHOR RODS SHALL BE USED PER SDD.

POLE HEIGHT TO BE DETERMINED BY SUPPLIER.

ALL ITEMS ASSOCIATED WITH SIGN BRIDGE INCLUDED IN BID ITEM "OVERHEAD SIGN SUPPORT S-40-996".

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Revised Sheet 271
August 19, 2014

ALLOWABLE DESIGN STRESSES

CONCRETE MASONRY FC=3500 PSI
HIGH STRENGTH BAR STEEL REINFORCEMENT, GRADE 60 FY=60,000 PSI

FOUNDATION DATA

ALLOWABLE SOIL BEARING PRESSURE = 3000 PSF

PROJECT NO: 1060-33-80	HWY: IH 894/IH 94/USH 45	COUNTY: MILWAUKEE	CONSTRUCTION DETAILS	SHEET 271	E

3

3

STORM SEWER PIPES SUMMARY

	608.0312 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 12-INCH LF	608.0315 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 15-INCH LF	608.0318* STORM SEWER PIPE REINFORCED CONCRETE CLASS III 18-INCH LF	608.0324* STORM SEWER PIPE REINFORCED CONCRETE CLASS III 24-INCH LF	608.0330 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 30-INCH LF	608.0336 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 36-INCH LF	608.0342 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 42-INCH LF	608.0348 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 48-INCH LF	608.0354 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 54-INCH LF	608.0360 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 60-INCH LF	608.0366 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 66-INCH LF	608.0372 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 72-INCH LF	608.0396 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 96-INCH LF
TOTAL	2301	2768	4897	20909	1843	1112	173	2250	1532	1275	990	1902	16

STORM SEWER PIPES SUMMARY CONTINUED

	608.0412 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 12-INCH LF	608.0415 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 15-INCH LF	608.0418 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 18-INCH LF	608.0424 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 24-INCH LF	608.0430 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 30-INCH LF	608.0436 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 36-INCH LF	608.0442 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 42-INCH LF	608.0448 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 48-INCH LF	608.0454 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 54-INCH LF	608.0466 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 66-INCH LF	608.0472 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 72-INCH LF	608.0478 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 78-INCH LF
TOTAL	654	378	456	2947	1089	475	677	2175	655	426	101	461

3

	608.0515 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 15-INCH LF	608.0518 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 18-INCH LF	608.0524 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 24-INCH LF	608.0530 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 30-INCH LF	608.0536 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 36-INCH LF	608.0572 STORM SEWER PIPE REINFORCED CONCRETE CLASS V 72-INCH LF	610.0158 STORM SEWER PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III 58X91-INCH LF	SPV.0090.8002 STORM SEWER PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III 77X121-INCH LF	SPV.0090.8003 STORM SEWER PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-IV 77X121-INCH LF	SPV.0090.8004 STORM SEWER PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-IV 38X60-INCH LF	SPV.0090.8096 TUNNEL EXCAVATION LF
TOTAL	19	144	408	35	54	287	594	978	489	363	1474

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ID 1060-33-80
Revised Sheet 1645
August 19, 2014

*ADDITIONAL QUANTITIES LISTED ELSEWHERE

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
7115	SPV.0060 SPECIAL 5106. ABANDONING MMSD SANITARY MANHOLE	1.000 EACH		.		.
7120	SPV.0060 SPECIAL 5109. MMSD SANITARY SEWER MANHOLE, 48- INCH	1.000 EACH		.		.
7125	SPV.0060 SPECIAL 5110. MMSD SANITARY MANYHOLE VACUUM TEST	1.000 EACH		.		.
7130	SPV.0090 SPECIAL 5013. DUCTILE IRON WATER MAIN 16-INCH RESTRAINED JOINT W/BACKFILL SLURRY	71.000 LF		.		.
7135	SPV.0090 SPECIAL 5014. STEEL CASING W/DUCTILE IRON 16- INCH CARRIER W/BACKFILL SLURRY	275.000 LF		.		.
7140	SPV.0090 SPECIAL 5120. ABANDONING SANITARY SEWER, 24-INCH	184.000 LF		.		.
7145	608.0442 STORM SEWER PIPE REINFORCED CONCRETE CLASS IV 42-INCH	677.000 LF		.		.
	SECTION 0001 TOTAL					.

SECTION 0002 B-40-855 OPTION A
ALT GROUP AA1

5430	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5435	209.0100 BACKFILL GRANULAR	40.000 CY	.		.	
5440	502.0100 CONCRETE MASONRY BRIDGES **P**	951.000 CY	.		.	
5445	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	214,290.000 LB	.		.	
5450	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	200,370.000 LB	.		.	
5455	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF	.		.	
5460	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0001. B-40-855	1,295.000 SF	.		.	
5465	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	5,706.000 DOL	1.00000		5706.00	
5470	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	7.000 EACH	.		.	
5475	SPV.0060 SPECIAL 4171. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 98.43-IN	7.000 EACH	.		.	
5480	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	28.000 HRS	.		.	

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5485	SPV.0090 SPECIAL 4460. DRILLED FOUNDATION SHAFT 98.43-INCH **P**	495.000 LF		.		.
5490	SPV.0105 SPECIAL 4510. TRIAL DRILLED FOUNDATION SHAFT 98.43-INCH	LUMP	LUMP			.
	SECTION 0002 TOTAL					.

SECTION 0003 B-40-855 OPTION B
ALT GROUP AA2

5495	206.1000 EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 0008. B-40-855	LUMP	LUMP			.
5500	209.0100 BACKFILL GRANULAR	341.000 CY		.		.
5505	502.0100 CONCRETE MASONRY BRIDGES **P**	1,100.000 CY		.		.
5510	505.0405 BAR STEEL REINFORCEMENT HS BRIDGES	188,970.000 LB		.		.
5515	505.0605 BAR STEEL REINFORCEMENT HS COATED BRIDGES	203,090.000 LB		.		.
5520	511.1200 TEMPORARY SHORING (STRUCTURE) 0001. B-40-855	1,670.000 SF		.		.
5525	511.2200 TEMPORARY SHORING LEFT IN PLACE (STRUCTURE) 0001. B-40-855	1,295.000 SF		.		.

CONTRACT: 20140826001 PROJECT(S): 1060-33-80 FEDERAL ID(S): WISC 2014314

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5530	550.2168 PILING CIP CONCRETE 16 X 0.50-INCH	2,100.000 LF		.		.
5535	715.0502 INCENTIVE STRENGTH CONCRETE STRUCTURES	6,600.000 DOL	1.00000		6600.00	
5540	SPV.0060 SPECIAL 4110. PILE DYNAMIC ANALYZER (PDA) TESTING	2.000 EACH		.		.
5545	SPV.0060 SPECIAL 4115. PILE DYNAMIC ANALYZER (PDA) RESTRIKES	2.000 EACH		.		.
5550	SPV.0060 SPECIAL 4160. DRILLED FOUNDATION SHAFT BASE GROUTING	6.000 EACH		.		.
5555	SPV.0060 SPECIAL 4171. THERM INTEGRITY PROFILER (TIP) TESTING DRILLED FOUND SHAFT 98.43-IN	6.000 EACH		.		.
5560	SPV.0075 SPECIAL 4200. OBSTRUCTIONS DRILLED FOUNDATION SHAFT	24.000 HRS		.		.
5565	SPV.0090 SPECIAL 4460. DRILLED FOUNDATION SHAFT 98.43-INCH **P**	400.000 LF		.		.
5570	SPV.0105 SPECIAL 4510. TRIAL DRILLED FOUNDATION SHAFT 98.43-INCH	LUMP	LUMP			.
	SECTION 0003 TOTAL					.
	TOTAL BID					.