HIGHWAY WORK PROPOSAL

Proposal Number: 1 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	1300-13-74		Lakefront Gateway IH 794 Ramps at Lincoln Memorial Drive	IH 794

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, $ 580,000.00 Payable to: Wisconsin Department of Transportation	Attach Proposal Guaranty on back of this PAGE.
Bid Submittal Due Date: November 10, 2015 Time (Local Time): 9:00 AM	Firm Name, Address, City, State, Zip Code **SAMPLE** **NOT FOR BIDDING PURPOSES**
Contract Completion Time October 16, 2018	
Assigned Disadvantaged Business Enterprise Goal 0%	This contract is exempt from 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)

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

(Date Commission Expires)

Notary Seal

(Bidder Signature)

(Print or Type Bidder Name)

(Bidder Title)

For Department Use Only

Type of Work Structures B-40-915, B-40-916, B-40-400 (Units 1D, 3C, 6C and 6D), retaining walls R-40-627, R-40-628, R-40-629, overhead sign structures, common excavation, borrow excavation, concrete pavement, curb and gutter, sidewalk, storm sewer, traffic control, lighting, high mast lighting, landscaping, streetscaping, signing, stormwater management facilities, pavement marking.	
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 2015 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://wisconsindot.gov/Pages/doing-bus/contractors/hcci/bid-let.aspx

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://wisconsindot.gov/Pages/doing-bus/contractors/hcci/bid-let.aspx

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.

(7) Addenda posted after 5:00 PM on the Thursday before the letting will be emailed to the eligible bidders for that proposal. All eligible bidders shall acknowledge receipt of the addenda whether they are bidding on the proposal or not. Not acknowledging receipt may jeopardize the awarding of the project.

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://wisconsindot.gov/Pages/doing-bus/contractors/hcci/bid-let.aspx

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)

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

(Signature of Attorney-in-Fact)

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

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 1300-13-74 Lakefront Gateway, IH 794 Ramps at Lincoln Memorial Drive, IH 794, 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, 2015 Edition, as published by the department, and these special provisions.

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 (20141107)

2. Scope of Work.

The work under this contract shall consist of B-40-915, B-40-916, B-40-400 (Units 1D, 3C, 6C and 6D), retaining walls (R-40-627, R-40-628, and R-40-629),sign structures, excavation, borrow excavation, concrete pavement, curb and gutter, sidewalk, storm sewer, traffic control, lighting, high mast lighting, landscaping, streetscaping, permanent signing, temporary and permanent pavement marking and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract.
104-005 (20090901)

3. 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 10 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.

Winter weather work, 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.

Anticipate cold weather and early spring and fall concrete masonry, HPC masonry structure, concrete paving and ancillary concrete work (curb, median barrier, etc). Plan to heat aggregates and water for mixes, and that the heating of the aggregate and water is considered incidental to those concrete items. Heating/housing of the pavement during the cure period may also be necessary; and will be considered incidental to construction. There will be no adverse weather delay for cold weather construction.

Replace standard spec 108.10.2.2(1) as follows:

(1) The engineer will award a time extension for severe weather on calendar day and completion date contracts. Submit a request for severe weather days if the number of adverse weather days, as defined in standard spec 101.3, exceeds the anticipated number of adverse weather days tabulated below.

Total Anticipated Adverse Weather Days for Each Calendar Month[2]

Jan:	8 days
Feb:	7 days
Mar:	8 days
April:	5 days
May:	4 days
June:	4 days (weather); 2 days Summerfest – 6 total days
July:	2 days (weather); 6 days Summerfest – 8 total days
Aug:	3 days
Sept:	4 days
Oct:	6 days
Nov 1 through 15:	0 Days
Nov 16 through 30:	N/A
Dec:	N/A

Prior to beginning operations under this contract submit in writing a proposed schedule of operations and method of coordination and handling traffic to the engineer for approval. The contractor's schedule of operations shall indicate working with adequate forces and equipment to assure that the work will be completed within the established contract time.

Submit an access plan for approval by the engineer that details the proposed entry and exit locations to the project site and work zones; including gate locations, construction access only signing, and methods that will be implemented to control access to the work zone during daytime and nighttime hours.

The contractor is advised that there may be multiple mobilizations for such items as traffic control, detours, signing items, pavement markings and other incidental items related to the staging. The department will make no additional payment for said mobilizations.

No contract work shall be performed during the 2016 Summerfest festival with estimated dates between June 29 and July 10, 2016. The contractor shall show this in their project schedule and plan construction activities accordingly.

The contractor is advised that Harbor Drive is closed by City of Milwaukee permit frequently for Lakefront festivals and other special events. Contractor access to/from Harbor Drive during construction will be restricted by these activities and the project shall be bid accordingly. At no time shall the contractor store equipment and/or material that would impose restrictions to traffic or the use of Harbor Drive for the lakefront activities.

When the contractor's work schedule shows any permanent lane closure that is permitted by the engineer, indicate a continuous effort to complete the work in a timely manner.

Do not begin or continue any work that closes the freeway or ramps outside the allowed time periods specified in this article or the article "Traffic." Work on IH 794 is only allowed during night time hours or as approved by the engineer. Work may be performed, provided such work operations do not include ingress and egress of vehicles and equipment which would obstruct the flow of traffic on the freeway, during peak traffic periods.

The schedule of operations shall conform to the construction staging as shown in the construction staging plans, unless the engineer approves modifications to the schedule in writing. The schedule of operations shall conform to the following construction staging as generally described herein:

Stage 1:

- Remove existing IH 794 eastbound exit ramp and westbound entrance ramp to Lincoln Memorial Drive; including Structures B-40-400 Units 3D, 3E, 1E and 1F.
- Construct drainage blanket and strip drains beneath retaining wall R-40-629.
- Begin construction of the proposed realigned IH 794 ramps including Structures B-40-915 and B-40-916, retaining wall R-40-629 and the rehabilitation of Structures B-40-400-3C and 1D.
- Construct the IH 794 eastbound entrance ramp improvements including retaining wall R-40-627.
- Begin construction of the south half of Clybourn Street improvements.
- Begin construction of the proposed Lincoln Memorial Drive improvements south of Clybourn Street.
- Begin construction of the east half of Lincoln Memorial Drive between Clybourn and Michigan Street.
- Coordinate with City forces constructing water main in the project footprint.

Stage 2:

- Construct the IH 794 westbound exit ramp to Lincoln Memorial Drive improvements.
- Construct retaining wall R-40-628 and Structure B-40-400-6C and 6D improvements.
- Continue construction of the proposed realigned IH 794 ramps including Structures B-40-915 and B-40-919, retaining wall R-40-629 and the rehabilitation of Structures B-40-400-3C and 1D.

- Continue construction of the south half of Clybourn Street.
- Continue construction of Lincoln Memorial Drive from the south project limits to Clybourn Street. The Lincoln Memorial Drive improvements, from the south project limits to the new ramp intersection, shall be complete by June 15, 2016.
- Complete the east half of Lincoln Memorial Drive between Clybourn and Michigan Street.

Stage 3:

- Continue construction of the proposed realigned IH 794 ramps.
- Continue construction of Lincoln Memorial Drive from the new ramp intersection to Clybourn Street.
- Construct the west half of Lincoln Memorial Drive between Clybourn and Michigan Street.
- Construct the north half of Clybourn Street between Van Buren Street and Lincoln Memorial Drive.

Stage 4:

- Continue construction of the proposed realigned IH 794 ramps.
- Construct the Lincoln Memorial Drive center median improvements between Clybourn and Michigan Street.
- Construct the Clybourn Street center median improvements between Van Buren Street and Lincoln Memorial Drive.

Stage 5:

- Complete construction of the proposed realigned IH 794 ramps by October 1, 2016.
- Permanent Pavement Marking on the westbound lanes of IH 794

<u>East Clybourn Street Driveway Construction Time Restrictions</u>

Work associated with the reconstruction of the driveways located along E. Clybourn Street shall be limited to the following time constraints and sequencing:

<u>Access to US Bank Parking Annex and 833 Michigan Street</u>

All work associated with the construction of the new driveway located 26+42.71 'CL' including the concrete driveway approach, concrete roadway pavement gap, and sidewalk shall be completed in a single weekend. Closure of the driveway shall be permitted for one weekend allowing closure from 6:00 PM on Friday through 7:00 AM on Monday.

Maintain Access to the US Bank loading dock daily from 6:00 AM to 6:00 PM, except for the noted closure above.

Contact the property representatives two weeks prior to beginning construction activities to coordinate property access modifications and impacts.

Contact Person: Gina P. Jaeckel General Manager U.S. Bank - Corporate Real Estate 777 East Wisconsin Avenue, Suite 3175 Milwaukee, WI 53202 Office: (414) 765-4615 gina.jaeckel@usbank.com	Mark Nicholson Property Manager – Wisconsin Colliers International 1243 North 10th Street Suite 300 Milwaukee, WI 53205 Office: (414) 278-6839 Mark.nicholson@colliers.com

US Bank

All work associated with the construction of the new driveway located Station. 23+64.02 'CL' including the concrete driveway approach, concrete roadway pavement gap, and sidewalk shall be completed in a single weekend. Closure of the driveway shall be permitted for one weekend allowing closure from 6:00 PM on Friday through 7:00 AM on Monday.

Contact the property representative two weeks prior to beginning construction activities to coordinate property access modifications and impacts.

Contact Person:
Gina P. Jaeckel
General Manager
U.S. Bank - Corporate Real Estate
777 East Wisconsin Avenue, Suite 3175
Milwaukee, WI 53202
Office: (414) 765-4615
gina.jaeckel@usbank.com

Do not switch traffic over to the next construction stage until all signing, pavement marking, traffic control devices, temporary signals for the stage are in place and operational; including the removal of all conflicting pavement markings and signs as shown in the traffic control plan and as directed by the engineer. Allowable exceptions to this specification are crossover and intersection areas where traffic control cannot be placed until the switch is made. Complete traffic switches only during non-peak hours.

The Oak Leaf trail and the Lake Loop of the Hank Aaron trail may not be closed at the same time. Provide trail detours as shown on plans.

Complete all construction operations on the IH 794 eastbound entrance ramp from Lincoln Memorial Drive to the stage necessary to open the ramp to traffic prior to 12:01 AM May 13, 2016. Do not reopen the ramp until all work associated with retaining wall R-40-627, structural approach slab, roadway pavement, curb and gutter, barrier and all other incidental work that is needed for the ramp to remain continuously open is complete.

If the contractor fails to complete the work necessary to reopen the IH 794 eastbound entrance ramp from Lincoln Memorial Drive prior to 12:01 AM May 13, 2016, the department will assess the contractor $4,000.00 in interim liquidated damages for each calendar day that the roadway remains closed after 12:01 AM, May 13, 2016. 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.

Complete construction operations on Lincoln Memorial Drive, Chicago Street and parking lots from the proposed realigned ramp intersection to the south project limits, to the stage necessary to open Chicago Street and the parking lot areas, roadway pavement, curb and gutter and sidewalk along Lincoln Memorial Drive to local traffic and Summerfest transit operations prior to 12:01 AM June 15, 2016. No work will be permitted in this area following the June 15, 2016 deadline.

Provide pedestrian access along Chicago Street to the Henry Maier festival grounds during Pridefest and the Rock 'n' Sole run. The currently scheduled dates for these events are June 10 to June 12, 2016.

Provide pedestrian access along either the east or west side of Lincoln Memorial Drive between the south project limit and Chicago Street during Pridefest and the Rock 'n' Sole run. The currently scheduled dates for these events are June 10 to June 12, 2016.

If the contractor fails to complete the work necessary to reopen Lincoln Memorial Drive, Chicago Street and parking lots or as described above prior to 12:01 AM June 15, 2016, the department will assess the contractor $1,500.00 in interim liquidated damages for each calendar day that the roadway remains closed after 12:01 AM, June 15, 2016. 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.

Complete all construction operations on the IH 794 westbound exit ramp to Lincoln Memorial Drive to the stage necessary to open the ramp to traffic prior to 12:01 AM July 30, 2016. Do not reopen the ramp until all work associated with retaining wall R-40-628, structural approach slab, roadway pavement, curb and gutter, barrier and all other incidental work that is needed for the ramp to remain continuously open is complete.

If the contractor fails to complete the work necessary to reopen the IH 794 westbound exit ramp to Lincoln Memorial Drive prior to 12:01 AM July 30, 2016, the department will assess the contractor $4,000.00 in interim liquidated damages for each calendar day that the roadway remains closed after 12:01 AM, July 30, 2016. 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.

Complete all construction operations on the IH 794 eastbound exit ramp to Lincoln Memorial Drive to the stage necessary to open the ramp to traffic prior to 12:01 AM October 1, 2016. Do not reopen the ramp until all work associated with Structure

B-40-915, retaining wall R-40-629, structural approach slab, roadway pavement, curb and gutter, barrier and all other incidental work that is needed for the ramp to remain continuously open is complete.

If the contractor fails to complete the work necessary to reopen the IH 794 eastbound exit ramp to Lincoln Memorial Drive prior to 12:01 AM October 1, 2016, the department will assess the contractor $4,000.00 in interim liquidated damages for each calendar day that the roadway remains closed after 12:01 AM, October 1, 2016. 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.

Complete all construction operations on the IH 794 westbound entrance ramp from Lincoln Memorial Drive to the stage necessary to open the ramp to traffic prior to 12:01 AM October 1, 2016. Do not reopen the ramp until all work associated with Structure B-40-916, retaining wall R-40-629, structural approach slab, roadway pavement, curb and gutter, barrier and all other incidental work that is needed for the ramp to remain continuously open is complete.

If the contractor fails to complete the work necessary to reopen the IH 794 westbound entrance ramp from Lincoln Memorial Drive prior to 12:01 AM October 1, 2016, the department will assess the contractor $4,000.00 in interim liquidated damages for each calendar day that the roadway remains closed after 12:01 AM, October 1, 2016. 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.

Complete all construction operations under this contract other than plant establishment period/surveillance and care cycles and associated contractual requirements for perennial, decorative grasses, trees, shrubs, and vines prior to 12:01 AM November 2, 2016.

If the contractor fails to complete all construction operations under this contract other than plant establishment period/surveillance and care cycles and associated contractual requirements for perennial, decorative grasses, trees, shrubs, and vines prior to 12:01 AM November 2, 2016, the department will assess the contractor $1810 in interim liquidated damages for each calendar day that the work remains incomplete beyond 12:01 AM November 2, 2016. An entire calendar day will be charged for any period of time within a calendar day that the work remains incomplete beyond 12:01 AM.

If contract time expires prior to completing all work specified in the contract, additional liquidated damages will be affixed according to standard spec 108.11.

Complete plant establishment period/surveillance and care cycles including all associated contractual requirements or all perennials, decorative grasses, trees, shrubs, and vines in this contract prior to 12:01 AM October 17, 2018.

Utility 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. 12_1211

Contractor Coordination
Attend weekly scheduling meetings to discuss the near term schedule activities, address any long-term schedule issues, and discuss any relevant technical issues. Develop a rolling three-week schedule identifying the previous week worked and a two week "look ahead". Provide sufficient detail to include actual and planned activities and all the subcontractors for offsite and construction activities, addressing all activities including ramp and lane closure schedules to be performed and identifying issues requiring engineering action or input. Submit plans for all traffic control for review by the engineer and approval a minimum of one week prior to implementation.

Winter Maintenance
Milwaukee County will perform snow removal operations for freeway and ramp lanes that are open to traffic. The City of Milwaukee 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. Attend a winter maintenance coordination meeting as scheduled by the department.

Definitions
The following definitions apply to this contract:

Morning peak hours:	6:00 AM to 10:00 AM (M-F)
Evening peak hours:	2:00 PM to 7:00 PM (M-F)
Night time hours - Freeways:	7:00 PM to 6:00 AM
Night time hours – Local streets:	10:00 PM to 6:00 AM
Night time hours - Full Freeway Closure:	10:00 PM – 5:00 AM

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.

Peregrine Falcons
State endangered Peregrine Falcons are present in the Milwaukee area. Juvenile birds may roost and forage from tall structures during August. Notify Kristina Betzold, Wisconsin Department of Natural Resources, (414) 263-8517 if falcons are present in the project work area.

4. Traffic.

Perform all work according to the requirements of standard spec 643, as detailed in the Traffic Control Plans and as hereinafter described.

A General
Accomplish the construction sequence, including the associated traffic control as detailed in the Construction Staging and Traffic Control sections of the plans, and as described in this Traffic article. Submit a detailed traffic control plan to the engineer for approval if different than the traffic control plan provided in the plan set. Submit this plan ten days prior to the preconstruction conference.

Submit all traffic control change requests to the engineer at least three working days prior to an actual traffic control change. A request does not constitute approval.

Designate an individual responsible for traffic control maintenance including access of local traffic, and 24-hour emergency traffic control repair. Provide the name and telephone number of this individual to the engineer.

Conduct construction operations as to provide access to emergency vehicles at all times.

B Road/Ramp Closures and Lane Restrictions
IH 794 lane restrictions and/or mainline closures will only be allowed during nighttime hours or as approved by the engineer.

The following ramp/road closures and lane restrictions are proposed during construction operations:

Stage 1
- Close eastbound IH 794 exit ramp to Lincoln Memorial Drive (LE). Detour traffic as shown in the plans.

- Close Lincoln Memorial Drive entrance ramp to westbound IH 794 (LW). Detour traffic as shown in the plans.

- Close Lincoln Memorial Drive entrance ramp to eastbound (southbound) IH 794 (LS). Detour traffic as shown in the plans.

- Reduce the westbound IH 794 (northbound) exit ramp to Lincoln Memorial Drive (LE) to one lane.

- Reduce Clybourn Street between Van Buren Street and the Transit Center entrance to two westbound lanes and one eastbound lane. Parking will be restricted on both sides of the street. Clybourn Street shall remain open to one lane of traffic in the westbound direction between Lincoln Memorial Drive and the Transit Center entrance.

- Van Buren Street from St. Paul Avenue to Clybourn Street will include two northbound lanes.

- Close Harbor Drive (north of Polk Street) to Chicago Street. Detour traffic as shown in plan.

- Close Chicago Street (east of Jackson Street) to Harbor Drive. Detour traffic as shown in plan.

- Close westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive. Detour traffic as shown in the plan. Westbound phase may be permitted on weekends as directed by the engineer.

- Restrict parking on Michigan Street between Van Buren and Jackson Street.

- Restrict parking on Broadway between Clybourn and Michigan Street.

Stage 2

- Open the IH 794 eastbound entrance ramp from Lincoln Memorial Drive (LS) by May 13, 2016 at the start of Stage 2.

- The IH 794 exit ramp to Lincoln Memorial Drive (LE) remains closed from Stage 1. Detour traffic as shown in the plans.

- The Lincoln Memorial Drive entrance ramp to westbound IH 794 (LW) remains closed from Stage 1. Detour traffic as shown in the plans.

- Close the westbound IH 794 (northbound) exit ramp to Lincoln Memorial Drive (LN). Detour traffic as shown in the plans.

- Maintain Clybourn Street between Van Buren Street and the Transit Center entrance to two westbound lanes and one eastbound lane. Parking will be restricted on both sides of the street. Clybourn Street shall remain open to one lane of traffic in the westbound direction between Lincoln Memorial Drive and the Transit Center entrance.

- Reduce Van Buren Street from St. Paul Avenue to Clybourn Street to one northbound lane to remove the existing bridge pier and complete final paving on Van Buren Street and ramp. Van Buren Street can be reduced to one lane for a period no longer than 3 weeks to complete this work.

- Harbor Drive (north of Polk Street to Chicago Street) remains closed from Stage 1.

- Chicago Street (east of Jackson Street to Harbor Drive) remains closed from Stage 1. Detour traffic as shown in plans.

- Westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive remain closed from Stage 1. Detour traffic as shown in the plan. Westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive to be opened on weekends (from 7:00 PM Friday to 6:00 AM Monday) from June 1, 2016 to September 5, 2016.

- Close northbound traffic on Milwaukee Street between St. Paul Avenue and Clybourn Street. Provided access to parking lots only as shown in plan.

- Close southbound traffic on Milwaukee Street from Michigan to Clybourn Street. Provide access to parking lots only as shown in plans.

- The local street detours for Milwaukee Street will consist of:
  Northbound: St. Paul Avenue to Water Street to Michigan Street
  Southbound: Michigan Street to Broadway to St. Paul Avenue.

- Parking restrictions on Michigan Street between Van Buren and Jackson Street remain in place from Stage 1.

Stage 3

- Open the IH 794 westbound exit ramp to Lincoln Memorial Drive (LN) by July 30, 2016 at the start of Stage 3.

- The IH 794 eastbound exit ramp to Lincoln Memorial Drive (LE) remains closed from Stage 1. Detour traffic as shown in the plans.

- The Lincoln Memorial Drive westbound entrance ramp to IH 794 (LW) remains closed from Stage 1. Detour traffic as shown in the plans.

- Close the northbound left turns lanes at Clybourn Street from the westbound IH 794 (northbound) exit ramp to Lincoln Memorial Drive (LN) as shown in the plans.

- Reduce Clybourn Street between Van Buren Street and the Transit Center entrance to two westbound lanes and one eastbound lane. Parking will be restricted on both sides of the street. Clybourn Street shall remain open to one lane of traffic in the westbound direction between Lincoln Memorial Drive and the Transit Center entrance.

- The westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive remain closed from Stage 1. Detour traffic as shown in the plan. Westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive to be opened on weekends (from 7:00 PM Friday to 6:00 AM Monday) from June 1, 2016 to September 5, 2016.

- Parking restrictions on Michigan Street between Van Buren and Jackson Street remain in place from Stage 1.

Stage 4

- The IH 794 eastbound exit ramp to Lincoln Memorial Drive (LE) remains closed from Stage 1. Detour traffic as shown in the plan.

- The Lincoln Memorial Drive entrance ramp to westbound IH 794 (LW) remains closed from Stage 1. Detour traffic as shown in the plan.

- Reduce Clybourn Street between Van Buren Street and the US Bank parking structure entrance to two westbound lanes and one eastbound lane. Restrict parking on both sides of the street. Clybourn Street shall remain open to one lane of traffic in the westbound direction between Lincoln Memorial Drive and the US Bank parking structure entrance.

- Northbound left turns at Clybourn Street from the westbound IH 794 (northbound) exit ramp to Lincoln Memorial Drive (LN) remain restricted from Stage 3.

- The westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive remain closed from Stage 1. Detour traffic as shown in the plan. Westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive to be opened on weekends (from 7:00 PM Friday to 6:00 AM Monday) from June 1, 2016 to September 5, 2016.

- Parking restrictions on Michigan Street between Van Buren and Jackson Street remain in place from Stage 1.

Stage 5

- The IH 794 eastbound exit ramp to Lincoln Memorial Drive (LE) remains closed from Stage 1. Detour traffic as shown in the plans until October 1, 2016.

- The Lincoln Memorial Drive entrance ramp to westbound IH 794 (LW) remains closed from Stage 1. Detour traffic as shown in the plans until October 1, 2016.

- The westbound lanes of traffic on Michigan Street between Harbor Drive and Lincoln Memorial Drive remain closed from Stage 1. Detour traffic as shown in the plan. Westbound phase may be permitted on weekends as directed by the engineer.

- Parking restrictions on Michigan Street between Van Buren and Jackson Street remain in place from Stage 1.

- Open through traffic on Lincoln Memorial Drive from south project limit to Michigan Street.

C Pedestrian Access

Maintain existing sidewalk at all times except as shown in the plans. If sidewalks will be obstructed, provide an alternate route or temporary surface for pedestrian. The temporary surface shall meet Americans with Disabilities Act Accessibility Guidelines (ADAAG) requirements and shall consist 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. Maintaining sidewalk is considered incidental to the contract. Maintain pedestrian access on cross streets. Pedestrian access may not be closed on two adjacent streets at the same time. At no time may there be storage of materials, equipment, traffic control devices, etc on any sidewalk or path without providing temporary pedestrian access in the same location.

The contractor shall provide pedestrian access along Chicago Street to the Henry Maier festival grounds during Pridefest and the Rock 'n' Sole run. The currently scheduled dates for these events are June 10 to June 12, 2016.

The contractor shall provide pedestrian access along either the east or west side of Lincoln Memorial Drive between the south project limit and Chicago Street during Pridefest and the Rock 'n' Sole run. The currently scheduled dates for these events are June 10 to June 12, 2016.

D Wisconsin Lane Closure System Advanced Notification

Notify the engineer and WisDOT SE Region Work Zone Engineer, Rebecca Klein, at (262) 548-8728 if there are changes in the schedule, early completions, or cancellations of scheduled work. Coordinate the locations of messages of portable changeable message signs with the engineer and WisDOT STOC. Notify the engineer and City of Milwaukee Traffic Division, Robert Bryson, (414) 286-3244 regarding requests for changes to alternate routes and detours.

Provide the following advance notification to the engineer for incorporation into the Wisconsin Lane Closure System (LCS).

CLOSURE TYPE AND REQUIRED MINIMUM ADVANCE NOTIFICATION

Closure type with height, weight, or width restrictions (available width, all lanes in one direction ≤16')	MINIMUM NOTIFICATION
Lane and shoulder closures	14 calendar days
Full roadway closures	14 calendar days
System and service ramp closures	14 calendar days
Full system and service ramp closures	14 calendar days
Detours	14 calendar days
Closure type without height, weight, or width restrictions (available width, all lanes in one direction >16')	**MINIMUM NOTIFICATION**
Lane and shoulder closures	3 business days
System and service ramp closures	3 business days
Modifying all closure types	3 business days

Discuss LCS completion dates and provide changes in the schedule to the engineer at weekly project meetings in order to manage closures nearing their completion date.

E Local Streets

Substantially accomplish City of Milwaukee local street traffic control as detailed on the plans and approved by the City of Milwaukee. The city contact for traffic is Mr. Jeff Polenske, City Engineer, (414) 286-2400. Submit all revisions to the proposed traffic control plans to the engineer and Jeff Polenske a minimum of 14 days before the requested dates for lane closings.

Perform the work under this contract in a manner that will interfere as little as possible with active traffic on the city streets. Do not park or store vehicles, equipment, or materials on the city streets adjacent to active traffic except at the time of performance of the work. Adjacent city streets may not be closed at the same time.

Materials or equipment may be stored within the right-of-way only at locations meeting the prior approval of the engineer.

At all times maintain access to residents, tenant parking lots and businesses on the existing local streets within the project work area except as identified in the plans or as approved by the engineer.

The City of Milwaukee Infrastructure Services Division will provide posting of parking restrictions that are necessary to facilitate operations only as requested by the contractor in writing, with notification provided to the engineer. Notify the City of Milwaukee, Anthony Kotecki, Civil Engineer III - City of Milwaukee Construction Utility Coordinator,

(414) 286-2433 office, (414) 708-3886 mobile; two weeks prior to work requiring parking restrictions.

The traffic control established for this project will require multiple mobilizations; as well as periodic modifications to the placement of traffic control items between daytime and nighttime operations. These mobilizations and daily movement of traffic control devices shall be considered incidental to the Traffic Control Surveillance and Maintenance pay item.

5. Holiday and Special Event Work Restrictions.

Do not haul materials of any kind along or across any portion of the highway carrying IH 794 traffic, Clybourn Street, Lincoln Memorial Drive, Harbor Drive or any other surrounding local street, and entirely clear the traveled way and shoulders of such portions of the highway and streets of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic during the following holiday periods:

- From noon Friday, May 27, 2016 to 6:00 AM Tuesday, May 31, 2016 for Memorial Day;
- From noon Friday July 1, 2016 to 6:00 AM Tuesday, July 5, 2016 for Independence Day;
- From noon Friday, September 2, 2016 to 6:00 AM Tuesday, September 6, 2016 for Labor Day;
- From noon Wednesday, November 23, 2016 to 6:00 AM Monday, November 28, 2016 for Thanksgiving.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying traffic on IH 794, Clybourn Street, Lincoln Memorial Drive, Harbor Drive or any other surrounding local street, 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 special event periods (dates are subject to change).

- From 6:00 AM Sunday, June 5, 2016 to 6:00 PM Sunday, June 5, 2016 for the UPAF Ride for the Arts;

- From 6:00 AM Saturday, June 11, 2016 to 6:00 PM Saturday, June 11, 2016 for the Summerfest Rock ‘N’ Sole run;

- From 12:00 AM Wednesday, June 29, 2016 to 6:00 AM Monday, July 11, 2016 for Summerfest;

- From 6:00 AM Saturday, September 17, 2016 to 6:00 PM Saturday, September 17, 2016 for the Briggs and Al’s run.

6. Utilities.

This contract comes under the provision of Administrative Rule Trans 220.
107-065 (20080501)

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, Patrick Stankiewicz, at (262) 548-5957 for further information.

There are underground and overhead utility facilities located within the project limits and there are known utility adjustments required for this construction project. Coordinate construction activities with a call to Digger's Hotline or a direct call to the utilities which have facilities in the area as required per statutes. Use caution to ensure the integrity of underground facilities and maintain code clearance from overhead facilities at all times.

Utility companies will be performing utility work and adjustments within the project limits prior to and during the life of this project. Cooperate and coordinate construction activities with these organizations.

Some of the utility work described below is dependent on prior work being performed by the contractor at a specific site. In such situations, provide the engineer and the affected utility a good faith notice of when the utility is to start work at the site. Provide this notice 14 to 16 calendar days in advance of when the prior work will be completed and 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 or as otherwise noted in this special provision.

Storm sewer work on the project will require coordination with utilities which may be in conflict with the storm sewer trench. In such situations, provide the engineer and the utilities in the area a good faith notice of when work will start in these areas. Provide this notice at least 5 working days in advance of when storm sewer work will begin in the area. Follow up with a confirmation notice to the engineer and the utility not less than three working days before the storm sewer contractor intends to begin the work.

Bidders are advised to contact each utility company listed in the plans prior to preparing their bids, to obtain current information on the status of existing and any new utility relocation work.

If a conflict with abandoned utility facilities is encountered, contact the appropriate utility owner/representative for instructions on proper removal and disposal of said facility.

AT&T Wisconsin has the following underground facilities in the project corridor:

- AT&T manholes and two duct packages containing fiber optic lines in Clybourn Street between Van Buren Street and the cul-de-sac to the east.

All AT&T facilities will remain in place and are anticipated not to be in conflict except for the following activities being performed by AT&T forces:

- The existing manhole #2B08 at Station 23+50 CL, 6.5' RT will be adjusted to meet finished grade by AT&T forces during construction. This work will be accomplished in one day. Contact Jay Bulanek at least five working days in advance to coordinate this work.

- The existing manhole #2B09 at Station 25+05 CL, 6.5' RT will be adjusted to meet finished grade by AT&T forces during construction. This work will be accomplished in one day. Contact Jay Bulanek at least five working days in advance to coordinate this work.

AT&T requires access to all manholes during construction. Contact Jay Bulanek of AT&T Wisconsin five business days prior to grading or paving operations.

AT&T will perform the following work prior to construction:

- Extend two, 4" PVC conduits from MH2B09 at Station 25+05 CL, 6.5' RT 700' to Station 32+05 CL, 6.5'RT. Conduits will be stubbed out and marked for future use depending on development timing, usage and City of Milwaukee Permits.
- Extend two, 4" PVC conduits from MH2B09 at Station 25+05 CL, 6.5' RT 55.5' to Station 25+25 CL, 41' RT. Conduits will be stubbed out and marked for future use depending on development timing, usage and City of Milwaukee Permits.
- Retire in place (RIP) facilities from MH 2B09 Station 25+05 CL, 6.5' RT to (2) MTD 47' and (2) 4" PC 157' to building Station 26+88 CL, 50' LT. Terminal no longer required for services, can be completed prior to construction.

The following items provide service to the CPS parking lot. Disconnection and abandonment is dependent on the demolition of the parking lot. Anticipated schedule is December 2015 to early 2016. Disconnect service order number for this work requires a minimum 7 day notice.

- Retire in place from MH 2B09 a 25 pair copper cable 245 feet to pedestal located at Station 26+80 CL, 62' RT.
- Retire in place one service B-Wire at Station 23+50 CL to booth and one service B-Wire to pedestal at Station 23+37 CL, 132' RT.
- Remove pedestal at Station 26+80 CL, 62' RT.

The field contact person for AT&T Wisconsin:

Jay Bulanek
7721 W. Fond du Lac Avenue
Milwaukee, WI 53218
Office: (414) 535-7407
Mobile: (414) 491-2855
jb5175@att.com

City of Milwaukee Underground Conduit (CUC)
Installation, adjustments and abandonment of CUC manholes and conduit are included as part of the proposed project improvements and have been identified in the plan set. These items will be performed by the contractor as part of Project 1300-13-74.

The City of Milwaukee will have its existing cables removed from the CUC system in both E. Clybourn Street from N. Van Buren Street to Lincoln Memorial Drive and in N. Lincoln Memorial Drive from E. Clybourn Street to N. Michigan Street prior to the start of construction. The know impacts to CUC facilities are as follows:

- E. Clybourn Street: There is an existing CUC package and manhole system on E. Clybourn Street between N. Van Buren Street and N. Lincoln Memorial Drive that will be impacted by paving and will be abandoned in place. A new 6-duct conduit package and manhole system will be installed in E. Clybourn Street between N. Van Buren Street and N. Lincoln Memorial Drive as part of the contract work.

- N. Lincoln Memorial Drive: There is an existing CUC conduit package and manhole system in N. Lincoln Memorial Drive that will be impacted by the proposed paving and will be abandoned in place. A new 6-duct conduit package and manhole system will be installed between E. Michigan Street and tie into an existing CUC manhole and conduit package approximately 500 feet south of E. Chicago Street. Laterals will be installed from the proposed CUC manholes to all proposed traffic control cabinets. The new conduit package and laterals will be installed as part of the contract work.

The contractor shall adjust all CUC manholes within the paving limits of this project as part of the contract work.

The field contact person for City of Milwaukee Underground Conduit is:

Karen Rogney
841 N Broadway, Room 920
Milwaukee, WI 53202
Office: (414) 286-3243
karen.rogney@milwaukee.gov

City of Milwaukee Communication Cabling (COM) has the following facilities that will be removed or abandoned in place prior to the start of construction:

- Communication cables in conduit along E. Clybourn Street from TES Manhole #1825 at Station 21+32.63 CL to TES manhole #1839A at Station 30+60 CL.
- Communications cables in conduit along Lincoln Memorial Drive from TES manhole #1839A at Station 32+00 LM to TES manhole #1837 at Station 35+31.84 LM.

The following facilities will remain in service for the duration of the project:

- Communications cables in conduit where a new manhole is to be placed at Chicago Street and Lincoln Memorial Drive at Station 18+21.51 LM.
- Communications cables in existing conduit connecting TES manholes at E. Clybourn Street and Van Buren Street will remain in service for the duration of the project. Cables will be relocated by City of Milwaukee forces and existing conduit can be abandoned once the new conduit between the manholes is in place. Impacted conduit is between TES manholes #1825, Station 21+32.63 CL, #1824 at Station 21+40.87 CL, and #1823 at Station 21+88.50 CL. Contractor to provide a minimum 5 day notice to city for cable relocation coordination.

Coordination will be required for existing cables through manholes and conduit at the intersections of E. Clybourn Street and Van Buren Street as well as Chicago Street and Lincoln Memorial Drive as described above. Cables in each location must remain active in existing conduits and manholes for the duration of the project. Cables in the conduits at the intersection of E. Clybourn Street and Van Buren Street will be relocated by city forces to the new conduit being installed as part of the project once the conduit is available.

The field contact person for City of Milwaukee Communication Cabling (COM) is:

Bryan M. Pawlak
1440 West Canal Street
Milwaukee, WI 53233
Communication Dispatch: (414) 286-3686

City of Milwaukee Street Lighting has facilities in the project corridor.

The City of Milwaukee will be removing existing lighting and providing temporary wood poles for temporary lighting on Clybourn Street prior to construction.

City street lighting facilities that are to remain in service within the project limits and intersections are shown on the Traffic Signal and Street Lighting Conduit Plan Set. Active underground street lighting facilities will be identified by the City of Milwaukee and noted to the contractor at the Pre-Construction Meeting.

Prior to construction, City of Milwaukee forces will install temporary lighting and remove existing light poles in conflict with the project in the following locations:

- Station 11+50 to Station 16+50 (S. Harbor Drive)
- Station 50+77 CH to Station 54+50 CH (E. Chicago Street)
- Station 30+00 LM to Station 35+00 LM (N. Lincoln Memorial Drive)
- Station 22+00 CL to Station 30+00 CL (E. Clybourn Street)

Contractor will install all PVC conduits, vaults, poles, luminaires and cables as necessary. During construction, the City of Milwaukee will install, modify and replace street lighting facilities as needed in coordination with construction operations. City of Milwaukee Street lighting will terminate and hook up the newly installed cables by the contractor to the existing street lighting circuitry.

During construction, the City of Milwaukee Street lighting permanent underground work will remove and replace all temporary facilities that fall within or about the project limits. City of Milwaukee Street Lighting forces will remove the above mentioned temporary street lighting overhead facilities after construction is completed.

Prior to construction, the City of Milwaukee Parking division will remove the parking pay station that is electrically fed by City of Milwaukee Street Lighting at street lighting unit 720 East Clybourn Street and 801 East Clybourn Street. The pay station will be put back in the same location by City of Milwaukee forces after construction. Similarly, any other parking pay station deemed to be in conflict with construction will be removed and replaced by the city after construction. Contact the city if a pay station is deemed in conflict.

Specified PVC conduit, vaults, junction boxes, luminaire mounting brackets, and concrete bases are to be installed by contractor as part of Project 1300-13-74 at the following locations:

- East Clybourn Street
- South Harbor Drive
- Lincoln Memorial Drive

Any additional impacts to City of Milwaukee Street Lighting will follow the following provision:

Provide a 10-working day advance notice to the City of Milwaukee's Street Lighting Field Operations Managers: Dennis Miller at (414) 708-4251 (cell) / (414) 286-5942 (office), George Berdine at (414) 708-4245 (cell) / (414) 286-5943 (office) or Thomas Hughes at (414) 708-3175 (cell) / (414) 708-3457 (office). If Mr. Miller, Berdine or Hughes is not available, then the contractor shall contact the dispatcher at (414) 286-5944 or (414) 286-3015 (after hours).

Coordinate construction activities with a call to Digger's Hotline or a direct call to the utilities that have facilities in the area as required by the statutes. The contractor will use caution to ensure the integrity of underground facilities and shall maintain code clearances from overhead facilities at all times.

The field contact person for City of Milwaukee Street Lighting is:

George Berdine
1540 West Canal Street
Milwaukee, WI 53233
Office: (414) 286-5943
Mobile: (414) 286-4245
gberdi@milwaukee.gov

City of Milwaukee Traffic Signals has facilities in the project corridor.

Prior to paving work all City of Milwaukee traffic signal equipment will be removed on Lincoln Memorial Drive at Ted Seaver Drive.

Traffic signal equipment will be removed at the intersection of Lincoln Memorial Drive and Michigan Street upon activation of temporary traffic signals being installed by the contractor. This work is anticipated to take 3 working days to complete.

All temporary traffic signal work will be completed by city forces at Clybourn Street and Van Buren Street prior to paving work including the installation of temporary overhead cable and relocation of signals hardware and poles.

All temporary signal work will be completed by city forces to deactivate underground cable and relocate or remove traffic signal equipment prior to paving work.

Upon project completion, the City of Milwaukee will remove all temporary traffic signal facilities in coordination with reconstruction.

Provide a 10 working day advance notice to coordinate the installation of traffic signal materials as well as any city traffic signal concerns.

The field contact person for City of Milwaukee Traffic Signals is:

Al Nichols
1540 West Canal Street
Milwaukee, WI 53233
Office: (414) 286-5941
Dispatch: (414) 286-3687
Mobile: (414) 708-5148
alfonzo.nichols@milwaukee.gov

City of Milwaukee Sewer has facilities in the project corridor.

No relocations are planned for existing sewers. Adjustments of sewer manholes, removals, and abandonments are included as part of the proposed project improvements and have been identified in the plan set. These items will be performed by the contractor as part of the contract work.

The City of Milwaukee will be responsible for inspection and approval of all sewer work. Contact the city five business days prior to performing the work to arrange for an inspector to be present at the time the work is to be completed.

The field contact person for City of Milwaukee Sewer is:

Anthony Kotecki
841 N. Broadway, Rm 710
Milwaukee, WI 53202
Office: (414) 286-2433
Mobile: (414) 708-3886
akotec@milwaukee.gov

City of Milwaukee Water (Milwaukee Water Works) has facilities in the project corridor. City of Milwaukee Water (Milwaukee Water Works) anticipates the following facilities to be in conflict and will move them prior to construction:

- A fire hydrant alteration is required at Station 12+53 LM, 19' RT. Alteration will be completed prior to paving operations.

Maintain access to all fire hydrants within the construction area for fire protection, and protect all hydrants against damage for the duration of the project.

Adjust all water valve boxes during/after paving according to bid item SPV.0060.1032 "Adjusting Water Boxes" and the corresponding special provision.

Assume all existing water mains will be live and under pressure. Take care so as not to damage the facility or disrupt service in any way.

The proposed construction work and the equipment used shall not affect the integrity of the existing water mains and appurtenances. If damaged, the contractor will be responsible for all costs incurred to restore the water main to its original condition.

The field contact for the City of Milwaukee Water (Milwaukee Water Works) is:

Dave Goldapp
841 N Broadway, Room 409
Milwaukee, WI 53202
Office: (414) 286-6301
Mobile: (414) 708-2695
dave.goldapp@milwaukee.gov

City of Milwaukee Parking Meters has facilities in the project corridor.
Prior to construction, the City of Milwaukee Parking Division will remove the parking meters and pay station that is electrically fed by City of Milwaukee Street Lighting at street lighting unit 720 East Clybourn Street and 801 East Clybourn Street. The pay stations will be put back in the same location by City of Milwaukee forces after construction.

The removal work is anticipated to take two days. Contact the city with at least one week's notice prior to start of the project in order to coordinate work with City of Milwaukee – Parking Meter Divisions.

The field contact person for City of Milwaukee Parking Meters is:

Natalie Hermann
841 N. Broadway
Milwaukee, WI 53202
Office: (414) 708-8596
Mobile: (414) 708-8596
natalie.hermann@milwaukee.gov

Milwaukee County Parks System has the following facilities in the project corridor:

Five Up-lights located between the Transit Center and the sidewalk west of Lincoln Memorial Drive between Station 32+00LM, 60'LT and Station 33+82LM, 57'LT. These lights will be removed and salvaged by Milwaukee County Parks. The buried cable will be abandoned in place.

The lights will remain in place and energized for public safety until the demolition of the existing sidewalk is performed by the contractor. Provide Milwaukee County a fourteen day notice prior to sidewalk removal to coordinate the removal of the lights. This work is anticipated to take five days to complete.

The construction field contact for Milwaukee County Parks is:

Gene Andrzejak
1150 N. 68th Street
Wauwatosa, WI 53226
Office: (414) 258-2322
Mobile: (414) 640-2204
Gene.andrzejak@milwaukeecountywi.gov

QWEST National Network has underground facilities in the project corridor.

There is an anticipated conflict between the existing QWEST fiber optic line and the proposed 48" storm sewer at Station 31+69CL, 75'RT. QWEST will coordinate with the contractor during construction to adjust the 2-2" HDPE conduits to avoid a conflict with the proposed storm sewer. The existing QWEST fiber line has adequate slack to adjust the line above or below the proposed storm sewer. The conduit adjustment is anticipated to take one working day.

The field contact person for QWEST is:

Lamar Lampkins
500 S. Water Street
Milwaukee, WI 53204
Mobile: (414) 416-5191
lamar.lampkins@centurylink.com

Time Warner Cable (TWC) owns and operates facilities in the project corridor. The majority of its facilities are located within existing city communication manholes and conduit. City of Milwaukee proposed CUC locations have been provided and will be utilized by TWC for its new cable. Coordination between TWC and CUC will be required during construction.

TWC is to vacate existing CUC conduit along E. Clybourn Street from Station 21+33CL, 28'LT to Station 30+71CL, 43' LT, continuing north along Lincoln Memorial Drive to Station 35+31LM, 31'RT. TWC is to also vacate CUC from Station 21+33CL, 28'LT to Station 21+41CL, 7' RT, and continuing to Station 21+89CL, 8'RT. Prior to construction TWC's reroute will be complete. TWC will then vacate existing CUC. TWC to re-route fiber optic within existing CUC and manhole systems beginning at the intersection of N. Van Buren Street and E. Clybourn Street continuing north to E. Michigan Street, turning to head east along E. Michigan Street then tying into existing facilities.

TWC facilities not located in CUC are not anticipated to be in conflict with the proposed construction.

Notify Time Warner Cable at least 10 working days prior to exposing Time Warner Cable facilities to coordinate work in the area.

The field contact person for Time Warner Cable is:

Steve Cramer
1320 N Dr. Martin Luther King Drive
Milwaukee, WI 53212
Office: (414) 277-4045
Mobile (414) 688-2385
steve.cramer@twcable.com

We Energies Electric has the following underground and overhead facilities in the project corridor that will need relocation or adjustment. We Energies plans to perform this work prior to the start of road construction:

- Station 61+32 VB, 33'LT adjust or reconfigure a 20' section of conduit to 28'LT to provide 5' horizontal clearance from the southeast corner of pier #1 footing. This work will occur in October 2015 and take 10 days to complete.
- Poles, conductors and direct buried cable serving the pad mounted transformer on the south side of E. Clybourn Street at Van Buren Street at Station 20+66CL to Station 23+37CL for electric service to the parking lot east of Van Buren Street will remain in place through 2015 and will be removed or abandoned in coordination with construction in early 2016 during off peak hours as part of the electric service application process. This work will take 5 days to complete.
- Disconnection and abandonment of electric service to existing WisDOT lighting and FTMS facilities will be coordinated with the installation of proposed WisDOT lighting facilities through the electric service application process. This work will take 3 to 5 days to complete.
- Direct buried cables crossing N. Lincoln Memorial Drive at Station 29+31LM will remain energized and in place until no longer necessary. The contractor will need to keep the line in service until the electrical services to the new light mast lighting is energized. The contractor will be responsible for maintaining the existing service during storm sewer and other construction in this area.

The following manholes will be adjusted by We Energies forces in coordination with grading and paving operations:

- Station 21+66CL, 19'LT Adjust manhole cover
- Station 25+30CL, 18'LTAdjust manhole cover
- Station 29+45CL, 40'LT Adjust manhole cover

All manhole frame/cover and structure adjustments will be performed by We Energies electric forces. Coordinate with We Energies when this work should take place in conjunction with paving and grading operations.

Where support of We Energies electric underground facilities is needed and/or for adjustment of We Energies manhole frames and covers to grade, contact John Merrick, Conduit Work Coordinator, at 414-881-5840 (office) or Robert Doonan, Underground Supervisor, at 414-540-5784 (office) or 414-315-7549 (mobile) with five working days notice.

It is imperative that the highway contractor contact We Energies before removing any electrical underground cables, to verify that they have been abandoned and carry no electrical current. The contractor must not assume that unmarked facilities have been abandoned. At no time is it acceptable to push, pull, cut or drill an unmarked facility without explicit consent from We Energies. Contractor must call the We Energies 24 hour Dispatch lines to arrange for this verification. We Energies Electric Dispatch, (800) 662-4797, We Energies Gas Dispatch, (800) 261-5325.

The construction field contact for We Energies Electric is:

Dave Thompson
500 South 116th Street
West Allis, WI 53214
Office: (414) 944-5558
Mobile: (414) 322-2148
david.thompson@we-energies.com

Wisconsin Gas Company d/b/a We Energies has the following underground facilities that will require relocation. This work will be performed by We Energies prior to the start of road construction:

- Station 21+18CL, 44'LT to Station 24+57CL, 44'LT, - 6" plastic pipe.
- Station 24+57CL, 38'LT to Station 25+51CL, 42'LT, - 4" plastic pipe.
- Crossing at Station 21+18CL, 2'RT to Station 21+18CL, 44'LT.
- Valve boxes will be adjusted by We Energies during construction.

Wisconsin Gas Company does not anticipate the following facilities to be in direct conflict with construction, but care must be taken in these areas:

- At Station 36+36LM, 39'RT, the 4" gas main should be clear of a conflict with the new curb.

Wisconsin Gas Company will abandon the following mains in place:

- At Station 21+41CL, 38'LT to Station 25+50CL, 38'LT, 4" steel.
- A crossing at Station 21+41CL, 2'RT to Station 21+41CL, 44'LT - 6" steel.
- At Station 21+18CL, 2'RT to Station 21+41CL, 2'RT, 6" steel.

Abandoned pipe coating samples will be obtained at the time of We Energies gas main relocation and analyzed for asbestos. If the coating contains asbestos, We Energies will

remove the main segment that is in direct conflict with the contractor's operation during the time the contractor has pavement removed in that area. This will take a maximum of 5 working days to abate and remove facilities if asbestos is present.

Contractor to remove and dispose of any abandoned gas facility that are clear of any asbestos.

It is anticipated that the work will begin September 8, 2015 and take ten working days to complete. Notify We Energies, Paul Osmanski at least five working days prior to exposing We Energies facilities to coordinate work in the area.

All valve box adjustments will be conducted by We Energies forces in conjunction with construction on the project. Contact Paul Osmanski at least five working days prior to final paving operations in the areas of valve box adjustment.

It is imperative that the highway contractor contact We Energies before removing any gas facilities to verify that they have been abandoned and carry no natural gas. The contractor must not assume that unmarked facilities have been abandoned. At no time is it acceptable to push, pull, cut or drill an unmarked facility without explicit consent from We Energies. Contractor must call the We Energies 24 hour Dispatch lines to arrange for this verification. We Energies Electric Dispatch, (800) 662-4797, We Energies Gas Dispatch, (800) 261-5325.

The construction field contact for Wisconsin Gas Company d/b/a We Energies Gas is:

Paul Osmanski
500 South 116th Street
West Allis, WI 53214
Office: (414) 944-5796
Mobile: (414) 315-1278
paul.osmanski@we-energies.com

WisDOT STOC (FTMS / ITS) ITS work is included as part of the proposed project improvements and have been identified in the plans. These items will be performed by the contractor as part of Project 1300-13-74.

The contact for WisDOT STOC (ITS) is:

Jeff Madson
433 W. St. Paul Avenue, Suite 300
Milwaukee, WI 53203
Office: (414) 255-3723
jeffrey.madson@dot.wi.gov

WisDOT Traffic Lighting WisDOT Traffic Lighting work is included as part of the proposed project improvements and have been identified in the plans. These items will be performed by the contractor as part of Project 1300-13-74.

The contact for WisDOT Traffic Lighting is:

Eric Perea
141 NW Barstow St
Waukesha, WI 53187
Office: (262) 574-5422
eric.perea@dot.wi.gov

WisDOT RWIS has the following facilities in the project corridor:

The existing weather station has been powered down. All usable equipment will be removed prior to July 1, 2015.

The highway contractor will be responsible for removing any abandoned equipment, including conduit and pavement sensors, which are determined to be in conflict with the proposed improvements.

The contact for WisDOT RWIS is:

Michael Adams
P.O. Box 7986 - Room 501
Madison, WI 53707
Office: (608) 266-5004
michael.adams@dot.wi.gov

Milwaukee World Festival, has the following facilities in the project area:

Milwaukee World Festival owns overhead lights, electrical cables, and poles located from Station 19+00 LM, 96' RT to Station 24+50 LM, 152' RT that are not in conflict with the project. No relocations are necessary for the project.

The field contact person for Milwaukee World Festival is:

Bob Gosse
200 North Harbor Drive
Milwaukee, WI 53202
Office: (414) 287-4466
rgosse@summerfest.com

7. Referenced Construction Specifications.

Construct the sanitary sewer and water main work conforming to the "Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition" and the "Milwaukee Water Works Specification." If there is a discrepancy or conflict between the referenced specifications and the standard specifications regarding contract administration, part 1 of the standard specifications governs.

8. Other Contracts.

The following projects will be under construction concurrently with the work under this contract:

Reconstruction of Harbor Drive between Chicago Street and E. Clybourn Street and the construction/extension of E. Clybourn Street from Lincoln Memorial Drive to Art Museum Drive under a City of Milwaukee contract. Work is anticipated to begin in September 2016. Harbor Drive will be closed to traffic during this project. Coordinate closure of the Hank Aaron State Trail and Oak Leaf Trail and associated detour routes with this project. Coordinate with Jeff Polenske, City Engineer, (414) 286-2400, e-mail jeffrey.polenske@milwaukee.gov.

City of Milwaukee Water Main
The City of Milwaukee will be installing water main improvements along Clybourn Street. Additional projects may be under construction concurrently with the work items under this contract.

Inquire with the City of Milwaukee, Milwaukee County and the department for any additional projects anticipated to be under construction in the project area or along proposed detour routes.

9. Hauling Restrictions.

Five business days in advance of any proposed hauling on local streets, present the proposed haul route plan to the City of Milwaukee, to the attention of Mr. Jeff Polenske, City of Milwaukee Engineer, (414) 286-2400. Include in the haul route submittal 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 City of Milwaukee will review the submittal and issue a hauling permit or provide a letter with comments and proposed revisions to the contractor within five business days of its receipt. Provide copies of the approval to the engineer prior to hauling on local streets. At all times, conduct operations in a manner that will cause a minimum disruption to traffic on existing roadways.

10. 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:

1. 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;
2. Drain all water from boats, trailers, bilges, live wells, coolers, bait buckets, engine compartments, and any other area where water may be trapped;
3. 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
4. Disinfect your boat, equipment and gear by either:
    a. Washing with ~212º F water (steam clean), or
    b. Drying thoroughly for five days after cleaning with soap and water and/or high pressure water, or
    c. 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)

11. 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 Andrew Malsom (WisDOT) at (262) 548-6705 or Andrew.Malsom@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.

12. Erosion Control.

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

Provide the ECIP 14 calendar days prior to the pre-construction conference. Provide 1 copy of the ECIP to WisDOT and 1 copy of the ECIP to the WDNR Liaison, Kristina Betzold, Wisconsin Department of Natural Resources, Southeast Region Headquarters, 2300 N. Dr. Martin Luther King Drive, Milwaukee WI 53212, (414) 263-8517. 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 calendar days after placement of topsoil. If graded areas are left exposed for more than 14 calendar days, seed those areas with temporary seed.

When performing roadway cleaning operations, the contractor shall use equipment having vacuum or water spray mechanism to eliminate the dispersion of dust. 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 calendar 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 or filter bag. Water pumped from areas identified with contaminated soils shall be handled as specified in the Special Provision "Excavation, Hauling, and Disposal of Petroleum Contaminated Soil, Item 205.0501.S".

13. Public Convenience and Safety - Project Noise Control and Restrictions.

A Description

A.1 General

The intent of this specification is to minimize construction noise within construction areas, lay-down areas, and communities adjacent to the construction site. To this end, the contractor and all subcontractors, suppliers, and vendors, are required to comply with all applicable noise regulations, specification requirements, and the noise level limits specified herein.

Replace standard spec 107.8(6) with the following:

Check for and comply with local ordinances governing the hours of operation of construction equipment, unless prior written approval is obtained from the engineer.

Noise levels between the night-time hours of 9:00 PM to 7:00 AM shall be restricted as follows including but not limited to the use of pneumatic hammers, pile driving and pavement removal, unless compliance is waived by 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, City Engineer, at (414) 286-2400 regarding the evening noise generating construction operations.

Use equipment with efficient noise-suppression devices and employ other noise abatement measures such as enclosures and barriers necessary for the protection of the public. In addition, schedule and conduct operations in a manner that will minimize the disturbance to the public in areas adjacent to the work and to occupants of buildings in the vicinity of

the work. Nighttime noise restrictions will be waived for certain operations within the work area identified as follows:

Removal of the deck, forming the deck, and placing concrete over roads which cannot be closed during daytime hours including: Van Buren Street and the IH 794 Van Buren Street Ramp.

A.2 Definitions

Definitions applicable for this specification.

- Noise is any audible sound that has the potential to annoy or disturb humans, or to cause an adverse psychological or physiological effect on humans.
- Nighttime refers to the period from 9:00 PM to 7:00 AM local time daily.
- Noise-Sensitive Locations shall mean locations where particular sensitivities to noise exist, such as residential areas, institutions, hospitals, and parks.
- Lot-line refers to the line separating a parcel of land from another parcel or from the street.
- Background Noise shall be defined as the measured ambient noise level associated with all existing environmental, transportation, and community noise sources in the absence of any audible construction activity.
- dB(A) shall be defined as the sound level (in decibels referenced to 20 micro-pascals) as measured using the A-weighting network on a sound level meter, according to ANSI S1.4 Standards.
- Leq shall be defined as the equivalent sound level, or the continuous sound level that represents the same sound energy as the varying sound levels, over a specified monitoring period.

A.3 Submittals

Submit a current laboratory calibration conformance certificate for the noise monitoring equipment to the engineer prior to performing any noise level monitoring. Submit updated certificates following subsequent yearly calibrations, or upon completion of repairs to the instrument, for the duration of this contract.

Submit shop and working drawings, computations, material data, and other descriptions for any Temporary Noise Barriers, Acoustical Barrier Enclosures, or Noise Control Curtains used for abatement measures. A Registered Professional Engineer of the State of Wisconsin shall stamp drawings and computations.

A.4 Construction Limitations

A.4.1 Noise Levels

Nighttime construction noise levels at all areas outside WisDOT right-of-way or easements shall not exceed 5 dB(A) over pre-construction ambient noise levels at the lot-line over a minimum 30 minute interval. The lot-line criteria shall apply to all points on a given lot-line of an affected receptor.

Perform work in a manner to minimize nuisance conditions such as noise that exhibits a specific audible frequency or tone (e.g., backup alarms, unmaintained equipment, brake squeal) or impact noise (e.g., jackhammers, hoe rams) to the greatest extent practicable. The engineer will make any final interpretation concerning whether or not nuisance noise conditions exist. The engineer has the authority to stop the work until nuisance noise conditions are resolved. If the engineer stops the work because of nuisance noise conditions, no additional time or compensation will be given.

A.4.2 Equipment Operations

The use of impact pile drivers and vibratory sheet pile driving shall be prohibited during nighttime hours.

Use of all impact devices, including hoe rams, jackhammers, chiseling devices, and pavement breakers, shall be prohibited during the nighttime hours. The engineer may allow the use of such equipment for the removal of structures over existing open roadways that can only be removed at night due to traffic considerations. The allowance of such use of impact devices for this reason between 9:00 PM and 7:00 AM shall be reviewed by the engineer in advance and allowed as an exception only upon sufficient justification.

B Materials

B.1 General

All equipment and materials specified in this part will remain the property of the contractor or contractor's subcontractors, vendors, and suppliers, as applicable.

B.2 Noise Monitoring Equipment

All noise measurements shall be performed with an instrument that is in compliance with the criteria for a Type 1 (Precision) or Type 2 (General Purpose) Sound Level Meter as defined in the current revision of ANSI Standard S1.4.

Sound level meters shall be capable of recording noise samples at 10 second intervals and calculating and displaying dB(A) Leq over 30 minute intervals in the field without the need for post-processing of data.

All sound level meters, microphones, and calibrators shall undergo certified laboratory calibration conformance testing at least once a year. Submit the calibration certificate to the engineer prior to use.

The sound level meter shall be on-site and readily accessible at all times.

B.3 Noise Reduction Materials and Equipment

Noise reduction materials shall be of a quality and condition to perform their designed function.

Noise reduction equipment and materials may include, but not be limited to:

1. Shields, shrouds, or intake and exhaust mufflers.
2. Noise-deadening material to line hoppers, conveyor transfer points, storage bins, or chutes.
3. Temporary Noise Barrier.
4. Noise Control Curtains.

All equipment with backup alarms operated by the contractor, vendors, suppliers, and subcontractors on the construction site shall be equipped with either audible self adjusting ambient-sensitive backup alarms or manually adjustable alarms. The ambient sensitive alarms shall automatically adjust to a maximum of 5 dB(A) over the surrounding background noise levels. The manually adjustable alarms shall be set at the lowest setting required to be audible above the surrounding noise. Installation and use of the alarms shall be consistent with the performance requirements of the current revisions of Society of Automotive Engineering (SAE) J994, J1446, and OSHA regulations.

C Construction

C.1 Noise Monitoring Methods

The measurement microphone shall be fitted with an appropriate windscreen, shall be located 5 feet above the ground, and shall be at least 5 feet away from the nearest acoustically-reflective surface.

Do not perform noise monitoring during precipitation or when wind speeds are greater than 15 mph, unless the microphone is protected in such a manner as to negate the acoustic effects of rain and high winds.

Calibrate the sound level meter with calibrator compatible with the sound level meter prior to each measurement or power on cycle.

Record noise samples at 10-second intervals and calculate Leq over a minimum of 30 minutes to a maximum of 24 hours as required by this specification or as directed by the engineer.

C.2 Background Noise Monitoring

Prior to the start of construction, collect background noise measurements for at least two nights (9:00 PM – 7:00 AM), over two days, Tuesday through Thursday, at noise monitoring receptor locations identified by the engineer.

Perform background noise measurements in the absence of any contributing construction noise for each of the noise monitoring receptor locations. Document and reference background noise (Leq) levels shall be for future use.

C.3 Construction Noise Monitoring

Take noise level measurements at each noise-sensitive location during ongoing construction activities at least once each week during the applicable nighttime period.
The time period for each noise measurement shall be 30 minutes.

Construction noise measurements shall coincide with nighttime periods of maximum noise-generating construction activity, and shall be performed during the construction phase or activity that has the greatest potential to exceed noise level limitations. Perform compliance noise measurements for the noise limits at a point on a given lot-line that is the closest to the construction activity.

If, in the estimation of the person performing the measurements, outside sources contribute significantly to the measured noise level, repeat the measurements with the same outside source contributions when construction is inactive to determine the ambient noise level contribution.

C.4 Noise Reporting

Record background, construction, and complaint response noise data on the Noise Measurements Report Form provided by the department.

Describe work operations and equipment during the monitoring period.

Also note all activities occurring while performing noise measurements in the "Field Notes" area of the report form. For example, "auger banging on ground to clean soil from threads" or "heavy traffic passing nearby the sound level meter."

During complaint response monitoring, submit the completed Noise Measurement Report to the engineer immediately upon completion of the noise reading. Submit all other monitoring reports to the engineer within 8 hours of the completion of the reading, unless the contractor is out of compliance, in which case the contractor shall immediately submit the results to the engineer.

C.5 Noise Reduction Methods

Use all reasonable efforts to implement noise reduction methods listed below to minimize construction noise emission. Noise reduction methods shall include, but not be limited to:

- Using concrete crushers or pavement saws for concrete deck removal, demolitions or similar construction activity; pre-augering pile holes to reduce the duration of impact or vibratory pile driving; solar powered variable message and sign boards connected to the local power grid over gasoline powered generators.
- Attaching intake and exhaust mufflers, shields, or shrouds; noise deadening material to inside of hoppers, conveyor transfer points or chutes.
- Maintaining equipment mufflers and lubrication; precast decking or plates to avoid rattling; surface irregularities on construction sites to prevent unnecessary noise.
- Limiting the number and duration of equipment idling on site; the use of loud speakers or public address system; the use of air or gasoline driven hand tools.
- Configuring to the extent feasible the construction site in a manner that keeps loud equipment and activities as far as possible from noise-sensitive locations; barrels or signage to detour traffic away from plated trenches.
- Scheduling of construction events and limiting usage times to minimize noise, especially during nighttime hours.

- Erecting noise barriers and/or noise curtain systems to intervene between the noise source and the noise receptor locations.
- Minimizing noise from the use of backup alarms using measures that meet OSHA regulations. This includes the use of self-adjusting ambient-sensitive backup alarms; manually-adjustable alarms on low setting; the use of observers; scheduling of activities so that alarm noise is minimized and designing construction site access such that delivery and dump trucks move through the site in a forward manner without the need to back up.

C.6 Complaint Procedure
The objective of the complaint procedure is to ensure that public and agency complaints are addressed and resolved consistently and expeditiously. If the contractor receives a complaint regarding construction noise, the contractor shall immediately notify the engineer.

Upon receipt or notification of a noise complaint from the engineer, the contractor shall promptly perform noise measurements at the complainant's location during activities representative of the offending operation. The noise measurements shall be performed using equipment and methods specified elsewhere in this specification. The complaint response noise measurements shall be immediately submitted to the engineer. In the event that the measured noise level exceeds allowable limits or is resulting in nuisance conditions, the contractor shall immediately use noise reduction materials and methods such as, but not limited to, those described in subsection C.5 to reduce noise levels or to alleviate the nuisance conditions.

D (Vacant)

E Payment
All costs for noise measuring equipment, the measuring and reporting of required ambient, weekly and complaint resolution noise readings, noise reduction methods and all costs associated with any fabrication, delivery, installation and removal of noise suppression devices will be considered incidental to the construction

14. Geotechnical Investigation Information.

Replace standard spec102.5(3) 2 with the following:

Available information relative to subsurface exploration, borings, soundings, water levels, elevations or profiles are available for review on the HCCI website: http://wisconsindot.gov/Pages/doing-bus/contractors/hcci/prelim-plan-se.aspx or at the department's SE Regions office. Contact Carolynn Gellings, 141 NW Barstow Street, Waukesha, WI 53187, (262) 548-8716.

Geotechnical Engineering Report
IH 794 Lakefront Gateway Project
Milwaukee, Wisconsin
June 8, 2015

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 according to the plans and specifications.
SEF Rev. 12_0813

15. Health and Safety Requirements for Workers Remediating Petroleum Contamination.

Supplement standard spec 107.1(2) with the following:

Soil contamination with gasoline, diesel fuel, fuel oil, or other petroleum related products may be encountered during excavation activities. Prepare a site specific Health and Safety Plan complying with the Occupational Safety and Health Administration (OSHA) standard for Hazardous Waste Operation and Emergency Response (HAZWOPER), 29 CFR 1910.120.

All site workers taking part in remediation activities or who will have the reasonable probability of exposure of safety or health hazards associated with the hazardous material shall have completed Health and Safety training that meets OSHA requirements. Prior to the start of remediation work, submit to the engineer a site specific Health and Safety Plan, and written verification that workers will have completed up-to-date OSHA training.

Develop, delineate, and enforce the health and safety exclusions zones for each contaminated site location pursuant to 29 CFR 1910.120.

16. Maintaining Drainage.

Maintain drainage at and through worksite during construction according to standard spec 107.22, 204, 205 and 520.

Use existing storm sewers, existing culvert pipes, existing drainage channels, temporary culvert pipes, or temporary drainage channels to maintain existing surface and pipe drainage. Pumps may be required to drain the surface, pipe, and structure discharges during construction. Costs for furnishing, operating, and maintaining the pumps is considered incidental to the project.

Dewatering (Mechanical Pumping) for Bypass Water (sediment-free) Operations
If dewatering bypass operations are required from one pipe structure to another downstream pipe structure or from the upstream to downstream end of a culvert and the bypass flow is not transporting sediments (sand, silt, and clay particles) from a tributary work site area, bypass pumping operations will be allowed provided that the department has been made aware of and approves operation. When pumping bypass flows, the discharge location will need to be stable and not produce any erosion from the discharge velocity that would cause release of sediment downstream.

Dewatering (Mechanical Pumping) for treatment Water (sediment-laden) Operations
If dewatering operations require pumping of water containing sediments (sand, silt, and clay particles), the discharge will not be allowed to leave the work site or discharge to a storm water conveyance system without sediment removal treatment. Refer to article Erosion Control in these special provisions for additional requirements.
SEF Rev. 15_0209
107-115 (20050502)

17. Municipality Acceptance of Sanitary Sewer Laterals and Irrigation Construction.

Both the department and City of Milwaukee personnel will inspect construction of sanitary sewer laterals and irrigation system under this contract. However, acceptance of the sanitary sewer and irrigation construction will be conducted by the City of Milwaukee. The contractor shall obtain the necessary permits from the City of Milwaukee for the sanitary and irrigation system connections. Costs associated with acquiring permits is considered incidental to these construction items. Contact Richard Husar, DNS Plumbing, at (414) 286-8219 for permit coordination.

The City of Milwaukee field contact person for coordinating inspection and acceptance is Anthony Kotecki, 841 N. Broadway, Rm 710, Milwaukee, WI 53202; Office: (414) 286-2433; Anthony.Kotecki@milwaukee.gov

18. Coordination with Businesses and Residents.

The department will arrange and conduct a meeting between the contractor, the department, affected residents, local officials and business people to discuss the project schedule of operations including vehicular and pedestrian access during construction operations. Hold the first meeting at least one week prior to the start of work under this contract and hold two meetings per month thereafter. The department will arrange for a suitable location for the meeting(s) that provides reasonable accommodation for public involvement. The department will prepare and coordinate publication of the meeting notices and mailings for the meeting(s). The contractor shall schedule the meeting(s) with at least two weeks prior notice to the engineer to allow for these notifications.

19. Available Documents.

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

- As-Built Drawings
- Preconstruction survey

These documents are available from Carolynn Gellings at 141 NW Barstow Street, Waukesha, WI 53187. She may be reached at (262) 548-8716.

Reproduction costs will be applied to any copies requested.

20. Notice to Contractor – City of Milwaukee Traffic Signals.

The City of Milwaukee will install temporary traffic signals, modify the existing signals and provide modifications to existing signal timing as necessary for traffic control along Clybourn Street and Michigan Street.

Prior to construction, any needed pole, signal standard, and control cabinet relocations; and temporary traffic signal work will be completed by City of Milwaukee forces. Coordinate all traffic control staging with the City of Milwaukee.

Any active underground traffic facilities will be noted to contractor at Pre-Construction Meeting. Coordinate all traffic control staging with the City of Milwaukee. Any additional impacts to City Traffic facilities for Mitigation shall follow this provision.

The contractor will be installing new traffic signals that will become property of the City of Milwaukee at the following intersections:

- Lincoln Memorial Drive and IH 794 Ramps/ Harbor Drive
- Lincoln Memorial Drive and Clybourn Street/IH 794 Ramps
- Clybourn Street and Van Buren Street

The contractor will be installing a temporary traffic signal at the intersection of Lincoln Memorial Drive and Michigan Street that will become property of the City of Milwaukee upon project completion.

Final wiring/ terminations in all cabinets that are to be city owned shall be performed by city forces. Coordinate final cabinet wiring with the City of Milwaukee's Traffic Signal Field Operations unit.

Provide a 10-working day advance notice to Mr. Al Nichols of the City of Milwaukee's Traffic Signal Field Operations at (414) 286-3687 (office) or (414) 708-5148 (mobile) to coordinate the installation of traffic signal materials. Coordinate all Traffic Signal Operation with Mr. Joseph Blakeman of the City of Milwaukee's Traffic Engineering at (414) 286-8070 as well as any city traffic signal concerns.

21. Notice to Contractor – Milwaukee County Transit System.

The Milwaukee County Transit System (MCTS) maintains bus routes through the project corridor and makes use of the Transit Center on the north side of Clybourn Street. Maintain access to the transit center at all times during project construction. Coordinate all impacts to bus operations and bus stops with MCTS. Notify MCTS at least 10 business days prior to beginning work. The MCTS contact is Melanie MacArthur, (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 cover or remove their existing bus stop signs. Notify MCTS at least ten days in advance. Coordinate with MCTS to provide temporary bus stops (as needed) at locations approved by MCTS and the engineer. 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 10 business days in advance.

22. Notice to Contractor – Archaeological Sites.

A department provided qualified archaeologist will be present to monitor construction related ground-disturbing activities along archaeological sites 47MI227 (unnamed site) and 47MI84/BMI-0153 (Huron and Cass Cemetery). The archaeological sites shall not be used for borrow or work disposal. If human bone is discovered, cease work activities immediately and contact the Wisconsin Historical Society at (800) 342-7834 or (608) 264-6507 for compliance with Wis. Statute 157.70 regarding the protection of human burial sites. Within the project vicinity, the archaeological sites are located at the following approximate locations:

- 78MI227, Station 115+70 LF to 121+30 LF, offset 57 feet right to 736 feet right

- 47MI84/BMI-0153, Station 20+00 CL to 24+50 CL, offset 220 feet left to 300 feet right

Notify the engineer at least two weeks in advance of work in this vicinity to allow for notification of the archaeologist. Comply with archaeologist's requirements during sub-grade monitoring.

23. Notice to Contractor, Surcharged Sewer and Dewatering Requirements.

Storm sewer work included in the contract connects to existing sewer that is surcharged. Special considerations will be required to construct the proposed storm sewer for this project; including but not limited dewatering the existing storm sewer system. No additional payment will be made for dewatering efforts or other special considerations that may be needed to perform the work.

24. Notice to Contractor, Lead Based Paint on Structure B-40-400.

Lead based paint is present on Structure B-40-400. Steel components of the bridge structures may be covered with paint containing lead. Any work which may disturb the paint must follow all applicable state and federal regulations regarding lead and lead waste.

25. Notice to Contractor, Noise Restrictions for Scheduled Lakefront Events.

Lakefront events, located immediately adjacent to the project work zone, occur throughout the summer months; primarily between Memorial Day through Labor Day weekends.

Currently scheduled lakefront festivals include the following:

EVENT	SCHEDULED DATES (Subject to Change)
Pridefest	Friday, June 10 to Sunday, June 12, 2016
Polishfest	Friday, June 17 to Sunday, June 19, 2016
Summerfest	Friday, June 29 to Sunday, July 10, 2016
Festa Italiana	Friday, July 22 to Sunday, July 24, 2016
Germanfest	Friday, July 29 to Sunday, July 31, 2016
African World Festival	Saturday, August 6 to Sunday, August 7, 2016
Irishfest	Thursday, August 18 to Sunday, August 21, 2016
Mexican Fiesta	Friday, August 26 to Sunday, August 28, 2016
Indian Summer	Friday, September 9 to Sunday, September 11, 2016

Be advised that noise levels shall be restricted 24 hours a day during these lakefront events as follows; including but not limited to the use of pneumatic hammers, pile driving and pavement removal, unless compliance is waived by 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

26. Abatement of Asbestos Containing Material B-40-400-1D, Item 203.0210.S.2001; B-40-400-1E, Item 203.0210.S.2002; B-40-400-1F, Item 203.0210.S.2003; B-40-400-3D, Item 203.0210.S.2005; B-40-400-3E, Item 203.0210.S.2006; B-40-400-5E, Item 203.0210.S.2007; B-40-400-6C, Item 203.0210.S.2008; B-40-400-6D, Item 203.0210.S.2009.

A Description

This special provision describes abating asbestos containing material on structures according to the plans, the pertinent provisions of the standard specifications, and as hereinafter provided.

B (Vacant)

C Construction

John Roelke, License Number All-119523, inspected Structure B-40-0400 1D, 1E, 1F, 3D, 3E, 5E, 6C and 6D for asbestos on November 3, 2011. RACM was found on these structures in the following locations (refer to the inspection reports for more detailed information on quantities per unit):

The gaskets located under the bridge railing attachment plates on the concrete parapet on units B-40-0400 1D, 6C and 6D tested positive for asbestos greater than 1% and is therefore regulated ACM.

The caulk located in the parapet expansion joints on units B-40-0400 6C and 6D tested positive for asbestos greater than 1% and is therefore regulated ACM.

The RACM on this structure must be abated by a licensed abatement contractor. A copy of the inspection report is available from Andrew Malsom (262) 548-6705. In accordance with 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 ten 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 Andrew Malsom (262) 548-6705 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:

General Information
Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, P.O. Box 798, Waukesha, WI, 53187
Contact: Carolynn Gellings, WisDOT SE Region
Phone: (262) 548-8716

Structure B-40-400, Unit 1D

- Site Name: Structure B-40-400, Unit 1D, Ramp Lake Freeway IH 794
- Site Address: Lat: 430211 Long: 875410, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 40 years. This structure was constructed in 1975.
- Area: 13,219 SF of deck.

Structure B-40-400, Unit 1E

- Site Name: Structure B-40-400, Unit 1E, Ramp Lake Freeway IH 794
- Site Address: Lat: 430211 Long: 875410, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 31 years. This structure was constructed in 1984.
- Area: 13,110 SF of deck.

Structure B-40-400, Unit 1F

- Site Name: Structure B-40-400, Unit 1F, Ramp Lake Freeway IH 794
- Site Address: Lat: 430211 Long: 875404, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 31 years. This structure was constructed in 1984.
- Area: 6,970 SF of deck.

Structure B-40-400, Unit 3D

- Site Name: Structure B-40-400, Unit 3D, Ramp IH 794 EB-Lake Freeway
- Site Address: Lat: 430206 Long: 875412, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 31 years. This structure was constructed in 1984.
- Area: 9,438 SF of deck.

Structure B-40-400, Unit 3E

- Site Name: Structure B-40-400, Unit 3E, Ramp IH 794 EB-Lake Freeway
- Site Address: Lat: 430206 Long: 875424, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 31 years. This structure was constructed in 1984.
- Area: 6,970 SF of deck.

Structure B-40-400, Unit 5E

- Site Name: Structure B-40-400, Unit 5E, Ramp Lincoln Memorial Drive – IH 794
- Site Address: Lat: 430209 Long: 875400, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 30 years. This structure was constructed in 1985.
- Area: 15,795 SF of deck.

Structure B-40-400, Unit 6C

- Site Name: Structure B-40-400, Unit 6C, IH 794
- Site Address: Lat: 430202 Long: 875359, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 40 years. This structure was constructed in 1975.
- Area: 16,382 SF of deck.

Structure B-40-400, Unit 6D

- Site Name: Structure B-40-400, Unit 6D, IH 794
- Site Address: Lat: 430129 Long: 875400, Section S28, Town 07N, Range 22E, City of Milwaukee.
- Age: 40 years. This structure was constructed in 1975.
- Area: 21,234 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 according 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 according 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.2001	Abatement of Asbestos Containing Material Structure B-40-400-1D	LS
203.0210.S.2002	Abatement of Asbestos Containing Material Structure B-40-400-1E	LS
203.0210.S.2003	Abatement of Asbestos Containing Material Structure B-40-400-1F	LS
203.0210.S.2005	Abatement of Asbestos Containing Material Structure B-40-400-3D	LS
203.0210.S.2006	Abatement of Asbestos Containing Material Structure B-40-400-3E	LS
203.0210.S.2007	Abatement of Asbestos Containing Material Structure B-40-400-5E	LS
203.0210.S.2008	Abatement of Asbestos Containing Material Structure B-40-400-6C	LS
203.0210.S.2009	Abatement of Asbestos Containing Material Structure B-40-400-6D	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)

27. Debris Containment B-40-915, Item 203.0225.S.2001; B-40-916, Item 203.0225.S.2002; B-40-400-1D, Item 203.0225.S.2003; B-40-400-1E, Item 203.0225.S.2004; B-40-400-3D, Item 203.0225.S.2005; B-40-400-3E, Item 203.0225.S.2006; B-40-400-3C, Item 203.0225.S.2007; B-40-400-6C, Item 203.0225.S.2008; B-40-400-6D, Item 203.0225.S.2009.

A Description
This special provision describes providing a containment system to prevent debris from structure removal, reconstruction, or other construction operations from falling onto facilities located under or adjacent to the structure. Using this containment system does not relieve the contractor of requirements under standard spec 107.17 and standard spec 107.19 or requirements under a US Army Corps of Engineers Section 404 Permit.

B (Vacant)

C Construction
Prior to starting work, submit a debris containment plan to the engineer for review. Incorporate engineer-requested modifications. Do not start work over Van Buren Street, Jackson Street, or parking lot areas until the engineer approves the debris containment plan.

Maintain adequate protection throughout construction for people and property within the potential fall zone. Ensure that a containment system capable of protecting underlying facilities from falling construction debris and cure water is in place before beginning deck repair, parapet removal, or other operations that may generate debris.

At least 15 working days before conducting potential debris generating operations, contact the following owners or lessees:

1. City of Milwaukee, Chris Fornal (414) 286-2400

D Measurement
The department will measure Debris Containment B-40-915, Debris Containment B-40-916, Debris Containment B-40-400-1D, Debris Containment B-40-400-1E, Debris Containment B-40-400-3D, Debris Containment B-40-400-3E, Debris Containment B-40-400-3C, Debris Containment B-40-400-6C, and Debris Containment B-40-400-6D 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 item:

ITEM NUMBER	DESCRIPTION	UNIT
203.0225.S.2001	Debris Containment B-40-915	LS
203.0225.S.2002	Debris Containment B-40-916	LS
203.0225.S.2003	Debris Containment B-40-400-1D	LS
203.0225.S.2004	Debris Containment B-40-400-1E	LS
203.0225.S.2005	Debris Containment B-40-400-3D	LS
203.0225.S.2006	Debris Containment B-40-400-3E	LS
203.0225.S.2007	Debris Containment B-40-400-3C	LS
203.0225.S.2008	Debris Containment B-40-400-6C	LS
203.0225.S.2009	Debris Containment B-40-400-6D	LS

Payment is full compensation for furnishing, installing, maintaining, and removing a debris containment system.

28. Removing Fence, Item 204.0170.

Add the following to standard spec 204.3.2.2:

Under the Removing Fence bid item, remove all fencing, posts, panels, bases and supplemental materials that make up the existing fencing system.

Add the following to standard spec 204.4:

The department will not measure Removing Fence. The department will use pay plan quantity conforming to standard spec 109.1.1.2.

Add the following to standard spec 204.5:

Payment for Removing Fence item is full compensation for removing, hauling, and disposing of all fencing, posts, panels, bases and supplemental materials that make up the existing fencing system; for backfill and restoring pavement.

29. Removing Bollards, 204.9060.S.0001.

A Description
This special provision describes removing bollards according to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Removing Bollards by the number of each individual bollard, acceptably removed.

E Payment
Supplement standard spec 204.5 to include the following:

ITEM NUMBER	DESCRIPTION	UNIT
204.9060.S.0001 204-025 (20041005)	Removing Bollards	Each

30. Removing Traffic Control Signs Fixed Message Left in Place by Others, Item 204.9060.S.0002.

A Description
This special provision describes removing Traffic Control Signs Fixed Message Left in Place by Others according to the pertinent provisions of standard spec 204 and as hereinafter provided.

B (Vacant)

C (Vacant)

D Measurement
The department will measure Removing Traffic Control Signs Fixed Message Left in Place by Others as each sign, acceptably completed.

E Payment
Supplement standard spec 204.5 to include the following:

ITEM NUMBER	DESCRIPTION	UNIT
204.9060.S.0002	Removing Traffic Control Signs Fixed Message Left in Place by Others	Each

204-025 (20041005)

31. Removing Concrete Barrier Temporary Precast Left in Place by Others, Item 204.9090.S.0003.

A Description
This special provision describes removing Concrete Barrier Temporary Precast Left in Place by Others according to the pertinent provisions of standard spec 204 and as hereinafter provided.

B Materials
Concrete Barrier Temporary Precast Left in Place by Others becomes the property of the contractor upon notice to proceed.

C (Vacant)

D Measurement
The department will measure Removing Concrete Barrier Temporary Precast Left in Place by Others by the linear foot, acceptably completed.

E Payment
Supplement standard spec 204.5 to include the following:

ITEM NUMBER	DESCRIPTION	UNIT
204.9090.S.0003	Removing Concrete Barrier Temporary Precast Left in Place by Others	LF

204-025 (20041005)

32. Excavation, Hauling, and Disposal of Petroleum Contaminated Soil, Item 205.0501.S.

A Description

A.1 General

This special provision describes excavating, loading, hauling, and bioremediation of petroleum contaminated soil at a DNR licensed facility. The closest DNR licensed landfill facilities that can bioremediate this soil once excavated are:

Advanced Disposal Emerald Park Landfill
W124 S10629 124th St.
Muskego, Wisconsin 53150
(414) 529-1360

Waste Management Orchard Ridge Landfill
N96 W13503 County Line Road
Menomonee Falls, WI 53051
(262) 253-8620

Perform this work according to 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 contaminated soil.

A.2 Notice to the Contractor – Contaminated Soil and Groundwater Locations

The department and others completed testing for soil and groundwater contamination for locations within this project where excavation is required. Testing indicated that petroleum-contaminated soil is present at the following locations as shown on the plans:

- Station 16+00 LM to 22+25 LM, from project limits left to approximately 110 feet right of reference line, from approximately 0 to 12+ feet bgs. Soil is contaminated with petroleum, metals, and foundry waste. Approximately 1,876 cubic yards (approximately 3,190 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this area for the installation of storm sewer and grading. Groundwater at this location is contaminated with petroleum, metals and cyanide.
- Station 22+25 LM to 23+50 LM, from 20 feet left of reference line to approximately 110 feet right of reference line, from approximately 0 to 12+ feet bgs. Soil is contaminated with petroleum, metals, and foundry waste. Approximately 717 cubic yards (approximately 1,208 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this area for the installation of storm sewer and grading. Groundwater at this location is contaminated with petroleum, metals and cyanide.
- Station 51+00 CH to 53+00 CH, from 70 feet left of reference line to 70 feet right of reference line, from approximately 0 to 8+ feet bgs. Soil is contaminated with petroleum, metals, and foundry waste. Approximately 505 cubic yards (approximately 858 tons at an estimated 1.7 tons per cubic yard) of soil will be

excavated from this area for the installation of storm sewer and grading. Groundwater at this location is contaminated with petroleum, metals and cyanide.

- Station 426+75 LN to 431+40 LN, from approximately 30 feet left of reference line to project limits right, from approximately 0 to 16+ feet bgs. Soil is contaminated with petroleum, metals, and foundry waste. Approximately 1,516 cubic yards (approximately 2,578 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this area for the installation of storm sewer, retaining wall, and grading.
- Station 31+80 LM to 35+10 LM, from approximately 15 feet right of reference line to project limits right, from approximately 0 to 12+ feet bgs. Soil is contaminated with petroleum, metals, and foundry waste. Approximately 201 cubic yards (approximately 342 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this area for the installation of storm sewer and grading.
- Station 31+00 CL to 32+50 CL, from 50 feet left of reference line to 60 feet right of reference line, from approximately 0 to 20+ feet bgs. Soil is contaminated with petroleum, metals, and foundry waste. Approximately 1,000 cubic yards (approximately 1,700 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this area for the installation of storm sewer and grading.

Directly load soil excavated by the project at the above locations into trucks that will transport the soil to a WDNR-licensed bioremediation facility.

If contaminated soils are encountered elsewhere on the project, terminate excavation activities in the area and notify the engineer.

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.

If dewatering is required at the above locations, conduct the dewatering according to Section C below.

A.3 Excavation Management Plan

The excavation management plan for this project has been designed to minimize the offsite bioremediation of contaminated 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:	Andrew Malsom
Address:	141 NW Barstow Street, PO Box 798, Waukesha, WI 53187-0798
Phone:	(262) 548-6705
Fax:	(262) 548-6891
E-mail:	andrew.malsom@dot.wi.gov

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) 901-2126, (262) 901-2142
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 contaminated soil to be excavated based on soil analytical results from previous investigations, visual observations, and field screening of soil that is excavated;
2. Identifying contaminated soils to be hauled to the bioremediation facility;
3. Documenting that activities associated with management of contaminated soil are in conformance with the contaminated soil management methods for this project as specified herein; and
4. Obtaining the necessary approvals for bioremediation of contaminated soil from the bioremediation 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 areas of contamination to the environmental consultant. Also notify the environmental consultant at least three calendar days prior to commencement of excavation activities in each of the contaminated areas.

Coordinate with the environmental consultant to ensure that the environmental consultant is present during excavation activities in the contaminated areas. Perform excavation work in each of the contaminated areas on a continuous basis until excavation work is completed.

Identify the DNR licensed bioremediation facility that will be used for bioremediation of contaminated soils, and provide this information to the environmental consultant no later than 30 calendar days prior to commencement of excavation activities in the contaminated areas or at the preconstruction conference, whichever comes first. The environmental consultant will be responsible for obtaining the necessary approvals from the bioremediation facility for bioremediation of contaminated soils. Do not transport contaminated soil offsite without prior approval from the environmental consultant.

A.5 Health and Safety Requirements
Supplement standard spec 107.1 with the following:

During excavation activities, expect to encounter soil contaminated with gasoline, diesel fuel, fuel oil, or other petroleum related products and metals. 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 contaminated site location 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 contaminated areas to minimize the quantity of contaminated soil excavated.

The environmental consultant will periodically monitor soil excavated from the contaminated areas. 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 offsite disposal to the DNR approved bioremediation facility. Use loading and hauling practices that are appropriate to prevent any spills or releases of petroleum-contaminated soils or residues. Prior to transport, sufficiently dewater soils designated for off-site disposal so as not to contain free liquids.

If dewatering is required in areas of known contamination, water generated from dewatering activities will likely contain petroleum, metals, and cyanide. Such water may, with approval of the Milwaukee Metropolitan Sewerage District (MMSD), be discharged to the sanitary sewer as follows:

- Meet all applicable requirements of the MMSD including the control of suspended solids. Perform all necessary monitoring to document compliance with MMSD's requirements. Furnish, install, operate, maintain, disassemble, and remove treatment equipment necessary to comply with MMSD's requirements.

- Ensure continuous dewatering and excavation safety at all times. Provide, operate, and maintain adequate pumping equipment and drainage and disposal facilities.

Notify the engineer of any dewatering activities, and obtain any permits necessary to discharge water. Provide copies of such permits to the engineer. 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 area are considered incidental to this pay item. The Wisconsin Department of Transportation will be the generator of regulated solid waste from this construction project.

D Measurement

The department will measure Excavation, Hauling, and Disposal of Petroleum Contaminated Soil in tons of contaminated soil accepted by the bioremediation facility as documented by weight tickets generated by the bioremediation facility.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
205.0501.S	Excavation, Hauling, and Disposal of Petroleum Contaminated Soil	Ton

Payment is full compensation for excavating, segregating, loading, hauling, and disposal of contaminated soil; obtaining solid waste collection and transportation service operating licenses; assisting in the collection soil samples for field evaluation; and dewatering of soils prior to transport, if necessary. No additional payment will be made for tipping fees associated with the disposal of contaminated soil.

33. Settlement Gauges, Item 205.2000.S.

A Description

This special provision describes furnishing and installing the settlement gauges and extensions according to the details shown on the plans and as hereinafter provided. The settlement gauge locations are as follows:

Feature	Station	Offset	Estimated Tip Elev.
R-40-629	205+05 LE	40 feet RT	Top of drainage blanket
R-40-629	206+00 LE	20 feet LT	Top of drainage blanket

B (Vacant)

C Construction
Compact embankment material in the immediate vicinity of the riser pipe to specification requirements, taking all precautions to keep alignment of the riser and the cover pipes vertical at all times. Backfill the riser plate on top of the drainage blanket with a minimum of 2 feet of fill to fix it in place.

Take all necessary precautions to ensure that the settlement gauges are not damaged, displaced or misaligned. If a gauge is damaged, immediately repair or replace it at no expense to the department.

D Measurement
The department will measure Settlement Gauges by each individual gauge, 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
205.2000.S	Settlement Gauges	Each

Payment is full compensation for furnishing and placing settlement gauges; protecting the gauges; and repairing or replacing gauges as necessary.
205-007 (20080902)

34. Staged Embankment Construction.

Construct the proposed wire-faced MSE wall R-40-629 according to the plan, standard spec 207, and as hereinafter provided.

Place the wire-faced MSE wall fill with a vertical face. The control and placement of wire-faced MSE wall fill will be based on the results of monitoring geotechnical instrumentation in the field. Install the vibrating wire piezometer instrumentation system after the installation of the strip drains and drainage blanket. Installation of the instrumentation system is expect to take a minimum of 5 working days. No embankment, temporary roadway construction or the first MSE wall lift within each designated area until the vibrating wire piezometer instrumentation system is in place and operational.

Each stage of the wire-faced MSE wall embankment construction shall consist of phases. A phase is defined as the placement of a lift to a specified elevation. During the first phase of wire-faced MSE wall construction, construct the MSE wall, and any temporary surcharge to the elevation shown in the table below unless directed otherwise by the engineer.

Station Begin	Station End	Alignment	Feature	Lift #	Fill Placement Limit / Lift Thickness	Average Depth of Strip Drain
204+93	206+10	LE	R-40-629	1	EL 606 / 17 feet max.	30 feet
				2	2 feet above pavement elevation	
206+10	207+42	LE	R-40-629	1	2 feet above pavement elevation	30 feet

Construct and compact the fill according to standard spec 207.3.6.2. Do not place the next lift (or pavement section) until instrumentation indicates that excess pore water pressures have been significantly dissipated and significant consolidation of the underlying soft soils has occurred. The second lift can be placed after six weeks of consolidation time if the data shows piezometer levels are no more than 2-feet above the baseline reading and settlement data shows no more than 0.5-inches in the last week and no more than 1-inch in the last two weeks. If these conditions have not occurred within six weeks after completion of completion of the previous lift, site conditions will be re-assessed and MSE wall construction procedures may be revised. The engineer reviewing the data may use judgment by considering all data in the event that readings are not consistent.

After the approval of the engineer, the next and subsequent phases of MSE wall construction can begin. Place a maximum amount of lift thickness shown in the table above during any phase of MSE wall construction.

Do not place subsequent MSE wall construction phases (or placement of the pavement section) until excess pore water pressures have been significantly dissipated and the underlying soft soils have achieved a significant portion of their anticipated consolidation under the weight of the present MSE wall construction phase. The subsequent construction phase can begin after six weeks of consolidation time if the data shows piezometer levels are no more than 2-feet above the baseline reading and settlement data shows no more than 0.5-inches in the last week and no more than 1-inch in the last two weeks. If these conditions have not occurred within six weeks after completion of completion of the previous Lift, site conditions will be re-assessed and MSE wall construction procedures may be revised. Each phase or lift should be constructed and compacted per standard spec 207.3.6.2.

If instrumentation monitoring indicates impending movement or instability of the MSE wall fill, the engineer may stop MSE wall construction operations.

Cooperate with the department and its representatives in the monitoring and protection of the geotechnical instrumentation for the MSE wall. Conduct construction activities such that the department has reasonable access to the terminal boxes and other geotechnical instrumentation. Take all necessary precautions to ensure that all geotechnical instrumentation is not damaged, displaced, or misaligned by contractor activities. If a geotechnical instrument is damaged by construction operations, repair the geotechnical

instrument, or if necessary, replace and install a new geotechnical instrument at no cost to the department.

35. 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://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/rdwy/default.aspx

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://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/tools/appr-prod/qual-labs.aspx

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 two 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)

36. 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://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/qmp/default.aspx

(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://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/qmp/default.aspx

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

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] The department will not assess a ride disincentive for HMA pavement placed in cold weather because of a department-caused delay as specified in 450.5(4) of the contract additional special provisions (ASP 6).

[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.

37. Steel Bridge Construction Plan.

A Description

A.1. General

This special provision descries the requirements for a Steel Bridge Construction Plan required to be to be prepared and submitted for each steel bridge structure on the project.

A.2 Structures

Submit a Steel Bridge Construction plan conforming to the requirements of this special provision for the following structures:

B-40-915
B-40-916

Submit the Steel Bridge Construction Plan, signed and sealed by a professional engineer registered in the State of Wisconsin, at least 14 days before structural steel transport, delivery and erection or as otherwise agreed to by the engineer.

A.3 Standard Specifications

The requirements herein supplement and are in addition to, all applicable requirements in the standard specifications.

A.4 Fabrication Shop Drawings

The contractor's steel bridge construction plan is in addition to, and not in lieu of, fabrication shop drawings. Submit fabrication shop drawings per standard spec 506. Provide additional information on fabrication shop drawings, if required, as hereinafter specified.

B (Vacant)

C Steel Bridge Construction Plan

C.1 General

The contractor's submitted steel bridge construction plan which provides details of fabrication, details of transportation and shipment, details of steel bridge erection, and details of concrete deck placement on steel bridge girders, shall be referred to hereinafter as the contractor's construction plan. This plan may be based on, in whole or in part, on any construction plan details shown in the contract documents or may be developed entirely by the contractor. In either event, it shall demonstrate the stability of the structure and individual components during each stage of construction, including while supported on temporary supports or jacks. Construction plan details shown in the contract documents shall not be taken as supplanting or implying any supplantation of the contractor's responsibility for the fabrication, transportation, erection, or construction of any part of the bridge.

The contractor's construction plan shall include:

- Fabrication procedures, including camber values and method of cambering and curving horizontally curved girders. Fabrication procedures may be included and shown on the submitted fabrication shop drawings. If included in the submitted fabrication shop drawings, this should be noted in the submitted construction plan.

- A transportation plan including shipping weights, lengths, widths and heights of fabricated components and subassemblies and means of shipping.

- An erection plan, including details of storage and handling at the site; sequence of erection; crane placement and capacities; and the location, capacity, elevation, design and construction details of any temporary falsework supports.

- Deck placement details including design and construction details of deck formwork and cantilever brackets; concrete placement sequence, including the time between placements; and the magnitude and position of any temporary load required to prevent girder lift-off at bearings.

C.2 Transportation Plan

Provide a transportation plan as part of the submitted construction plan. The transportation plan shall show the type of girder supports required and their locations identified. The types, size, and locations of tie-downs shall be shown. A sufficient number of tie-downs shall be specified to provide adequate redundancy.

Girder stresses due to self-weight while being shipped shall be computed with a dynamic load allowance of 100 percent. The computed girder stresses shall satisfy the provision of Article 6.10.3.2 or 6.11.3.2 of the *AASHTO LRFD Bridge Design Specifications*, as applicable. Include these computations in the transportation plan.

Fatigue stresses shall not exceed the constant-amplitude fatigue threshold for the appropriate categories in table 6.6.1.2.5-3 of the *AASHTO LRFD Bridge Design Specifications*.

Wherever practical, submit design computations detailing the determination of the required vertical and lateral support loads during steel girder erection. Ship girders in the same orientation as in the completed structure. Support girders in such a manner that their cross-section shape is maintained and through-thickness stresses are minimized.

Provide supports as required during transportation to ensure that dynamic lateral bending stressed are minimized.

Temporary stiffening trusses or beams, if required to meet the requirements of this section shall be specified and detailed in the transportation plan.

C.3 Erection Plan

C.3.1.General

An erection plan shall be included as part of the submitted construction plan. Submit drawings illustrating fully the proposed method of erection. The drawings shall show details of all falsework bents, bracing, guys, dead-men, lifting devices, and attachments to the bridge members; sequence of erection, location of cranes, crane capacities, location of lifting points on the bridge members, and weights of the members. The drawings shall be complete in detail for all anticipated phases and conditions during erection. Calculations are required to demonstrate that factored resistances are not exceeded and that member capacities and final geometry will be correct.

The submitted erection plan shall consider and ensure the stability of the girders are maintained throughout the erection process. The stage of completeness of bolted connections shall be considered when evaluating the strength and stability of the steel during erection.

The erection procedure shall conform to the submitted erection plan. Any modifications to or deviation from the submitted erection plan, shall require revised drawings and verification of stressed and geometry.

C.3.2 Camber Diagram

Include camber diagrams in the erection plan or submitted fabrication shop drawings showing the camber at location of field splices and fractions of span length (quarter points minimum).

Cambers shown in the contract drawings are based on the assumption that the deck concrete is placed uniformly and simultaneously on the whole bridge or unit. The contractor is required to investigate the geometric response of the bridge based on the proposed deck placement sequence. In calculating and evaluating cambers consider vertical, lateral, and twist deflections due to dead load. Carefully consider the sequence of load application and incremental curing of the deck concrete during staged placement of the deck on continuous span bridges. Address time dependent effects, including creep, shrinkage and load shedding effects were appropriate. If the contractor's engineer deems these effects to be insignificant, include a statement to this effect in the contractor's submitted Steel Bridge Construction Plan.

Adhere to cambers provided on the contract documents unless the steel erection or deck placement is to be performed in such a manner that will lead to deflections different from those used to determine the camber specified. If the contractor or the contractor's fabricator / detailer or erector intends other procedures or outcomes, the approach shall be confirmed with the engineer, prior to beginning fabrication. Provide any additional documentation or submissions required by the engineer at no additional cost to the department.

C.3.3 Erection Falsework

Design falsework according to Section 3, "Temporary Works," of the *AASHTO LRFD Bridge Construction Specifications* to carry the vertical and lateral loads specified in the submitted erection plan. Set the elevation of falsework as necessary to support the girders at the cambered no-load elevation. If used in conjunction with the falsework, use jacks that have a stroke adequate to permit full unloading. Provide means of unloading of temporary supports in a manner that all temporary supports at each cross-section are unloaded uniformly.

Submit design computations detailing the determination of the required vertical and lateral support loads during steel girder erection. Submit structural design computations for all falsework to the required capacity and construction details of all required falsework including falsework foundation support. The falsework calculations and construction detail drawings shall be signed and sealed by a professional engineer registered in the State of Wisconsin.

C.3.4 Handling and Storing Materials

Indicate means of methods of structural steel material handling and storage on site in the submitted erection plan. Materials to be stored at the job site shall be placed on skids above the ground. The storage area shall be kept clean and properly drained. Place girders and beams in upright positions held in place with adequate shoring and bracing. Long members shall be supported on skids placed near enough together to prevent injury and deformation from deflection.

C.3.5 Erection Stresses

Factored stresses due to self weight of the steel and wind at each stage of erection shall not exceed those computed according to the provisions of the *AASHTO LRFD Bridge Design Specifications* and as hereinafter specified. Provide computations which show that the factored constructions stresses satisfy the requirements of the Articles 6.10.3 and 6.11.3 "Constructability," of the *AASHTO LRFD Bridge Design Specifications*, as applicable.

Any erection stresses induced in the structure as a result of using a method of erection which differs from the assumptions given in the contract documents shall be accounted for by the contractor. Erection design calculations for such changed methods shall be prepared at the contractor's expense and submitted to the engineer as part of the submitted erection plan. The calculations shall indicate any change in stresses or change in behavior for the temporary and final structures. Additional material required to keep both the temporary and final stresses within the allowable limits used in design shall be provided at the contractor's expense.

The contractor is responsible for providing temporary bracing or stiffening devices to accommodate handling stresses in individual members or segments of the structure during erection.

C.3.6 Maintaining Alignment and Camber

During erection, the contractor is responsible for supporting segments of the structure in a manner that will produce the proper alignment and camber in the completed structure. Install cross frames and diagonal bracing as necessary during the erection process to provide stability and assure correct geometry. Temporary bracing if necessary at any stage of erection, shall be provided by the contractor.

C.4 Concrete Deck Placement Plan

C.4.1 General

Submit a Concrete Deck Placement Plan indicating the sequence and methods of deck placement on the erected structural steel. Concrete placements shall be made in the sequence specified in the submitted steel bridge construction plan. The time between placements shall be such that the concrete in prior placement has reached an age or strength specified in the submitted concrete deck placement plan. Identify any admixture agents to be used in the deck concrete mix in the concrete deck placement plan. If used, admixtures must be permitted by and conform to the requirements of the standard specifications. The planned duration of each placement shall be specified in the construction plan.

C.4.2 Concrete Deck Formwork

Include details of cast-in-place deck formwork including overhang brackets and forms in the submitted concrete deck placement plan. Deck formwork shall conform to the requirements of the plans and standard specifications.

Attach overhang brackets to the top flange. If noted on the plans, overhang brackets must bear near the bottom flange within the limits noted on the plans. If the overhang brackets bear against the web, the contractor's engineer must ensure that precautions have been taken to prevent the permanent deformation of the web and excessive deflection of the wet slab and forms. Investigate the lateral force on the top flange due to overhang brackets to ensure that the flange is adequate as specified in Article 6.10.3.4 "Deck Placement" of the *AASHTO LRFD Bridge Design Specifications*.

Loads applied on the overhang brackets shall be considered in determining lateral flange bending stresses cross-frame forces, and associated web and top flange deformations. If the loads or their application are to be different than those provided in the contract documents, an additional analysis shall be made and supporting calculations submitted as part of the erection plan.

C.5 Plan Conformance

Perform all steel bridge fabrication, transportation, erection and concrete deck placement according to the submitted steel bridge construction plan. Submit a revised construction plan including revised drawings and re-verification of stresses and geometry prior to implementing any modifications to or deviations from the submitted steel erection plan.

D Measurement

The department will not measure Steel Bridge Construction Plan separately for payment.

E Payment
The department will not pay for Steel Bridge Construction Plan under a separate bid item. Include the cost of preparing and submitting the Steel Bridge Construction Plan which includes additional requirements for steel fabrication shop drawings, a steel bridge transportation plan, a steel bridge erection plan, and a cast-in-place deck placement plan, all supporting drawings, design calculations and other specified documentation and conformance with the submitted plans in the bid item Structural Steel HS.
SEF Rev. 14_09XX

38. Crack Sealing Epoxy, Item 502.0717.S.

A Description
This special provision describes sealing all transverse and longitudinal cracks in the decks as shown on the plans and as hereinafter provided.

B Materials
Provide a penetrating sealant that is listed on the department's approved product listing, "Low Viscosity Crack Sealers".

C Construction
Clean the cracks to be sealed by the use of high pressure air after Cleaning Deck and Preparation Deck are completed.

Pour the epoxy sealant into the cracks to be sealed after the deck preparation has been completed and before the overlay is placed. Place the sealant in as narrow a band as possible so that the bond of the new concrete overlay to the existing concrete is not impaired.

At no expense to the department, clean all spills and clean all areas of too wide a band of sealant before the overlay is placed.

D Measurement
The department will measure Crack Sealing Epoxy in length by the linear foot of cracks, sealed 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
502.0717.S	Crack Sealing Epoxy	LF

Payment is full compensation for furnishing and placing the epoxy sealant, including any required cleaning.
502-015 (20090901)

39. Expansion Device, B-40-400-6D, Item 502.3100.2001; Expansion Device, B-40-915, Item 502.3100.2002; Expansion Device, B-40-916, Item 502.3100.2003.

A Description

This special provision describes furnishing and installing an expansion device according 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:

	Model Number Strip Seal Gland Size*		
Manufacturer	**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)

40. Pigmented Protective Surface Treatment, Item 502.3210.S.

A Description
This special provision describes providing a pigmented cure and seal compound to the inside and top faces of concrete parapets.

B Materials
Furnish a gray Cure and Seal Compound for Non-Trafficked Surfaces on Structural Masonry selected from the department's approved products list unless the contract specifies a different color.

C Construction
Apply pigmented cure and seal compound to the inside and top faces of concrete parapets after the required surface finish has been applied per standard spec 502.3.7. Apply before opening to traffic and before suspending work for the winter.

Ensure that the concrete is clean and dry, and that application equipment is clean and functioning properly. Air blast immediately before applying the pigmented cure and seal compound to remove all dust or loose particles. Follow the manufacturer's recommended coverage rate. If application at that rate in a single coat causes running, use two lighter coats allowed to dry between coats.

D Measurement
The department will measure Pigmented Protective Surface Treatment 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
502.3210.S	Pigmented Protective Surface Treatment	SY

Payment is full compensation for providing the compound; including surface preparation and cleaning.
502-050 (20141107)

41. Bar Steel Reinforcement HS Stainless Structures, Item 505.0800.S.

A Description

This special provision describes furnishing and placing stainless steel reinforcing bars and associated stainless steel bar couplers.

Conform to standard spec 505 as modified in this special provision.

B Materials

B.1 General

Furnish stainless steel reinforcing bars conforming to ASTM A955 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. Conform to the chemical composition specified for the given UNS designation in ASTM A276 table 1.

Supply bars that are free of dirt, mill scale, oil, and debris by pickling to a bright or uniform light finish. The department may reject bars displaying rust/oxidation, questionable blemishes, or lack of a bright or uniform pickled surface.

Furnish chairs or continuous supports made of stainless steel or recycled plastic to support high-strength stainless bar steel reinforcement subject to the plastic chair restriction stated in standard spec 505.3.4(1).

Furnish couplers made from one of the UNS alloys allowed for bar steel.

Furnish tie wire made from one of the UNS alloys allowed for bar steel or from an engineer-approved plastic or nonmetallic material. Ensure that stainless steel tie wire is dead soft annealed.

B.2 Fabrication

Before fabrication, supply test results from an independent testing agency certifying that the reinforcement meets the requirements of Annex A1 of ASTM A955.

Bend bars conforming to standard spec 505.3.2 and according to ASTM A955. Bend and cut bars using equipment thoroughly cleaned or otherwise modified to prevent contamination from carbon steel or other contaminants. Use tools dedicated solely to working with stainless steel.

B.3 Control of Material

Identify reinforcement bars delivered to the project site with tags bearing the identification symbols used in the plans. Include the UNS designation, heat treat condition, heat number, grade corresponding to minimum yield strength level, and sufficient documentation to track each bar bundle to a mill test report.

Provide samples for department testing and acceptance according to CMM 8-50 Exhibit 1 requirements for concrete masonry reinforcement for uncoated bar steel.

Provide mill test reports for the project that do the following:

1. Verify that sampling and testing procedures and test results conform to ASTM A955, ASTM A276 table 1, and these contract requirements.
2. Include a chemical analysis with the UNS designation, heat lot identification, and the source of the metal.
3. Include tensile strength, yield strength, and elongation tests results conforming to ASTM A955 for each size furnished.
4. Certify that the bars have been pickled to a bright or uniform light finish.

C Construction

C.1 General

Ship, handle, store, and place the stainless steel reinforcing as follows:

1. Separate from regular reinforcement during shipping. Pad points of contact with steel chains or banding, or secure with non-metallic straps.
2. Store on wooden cribbing separated from regular reinforcement. Cover with tarpaulins if stored outside.
3. Handle with non-metallic slings.
4. Do not flame cut or weld. Protect from contamination when cutting, grinding, or welding other steel products above or near the stainless steel during construction.
5. Place on plastic or stainless steel bar chairs. If placing stainless steel chairs on steel beams, use chairs with plastic-coated feet.
6. Tie with stainless steel wire or an engineer-approved plastic or nonmetallic material.

Do not tie stainless steel reinforcing bars to, or allow contact with, uncoated reinforcing bars or galvanized steel. Maintain at least 1-inch clearance between stainless steel bars or dowels and uncoated or galvanized steel. Where 1-inch clearance is not possible, sleeve bars with a continuous polyethylene or nylon tube at least 1/8-inch thick extending at least 1 inch in each direction and bind with nylon or polypropylene cable ties. Sleeves are not required between stainless steel bars and shear studs. Stainless steel bars can be in direct contact with undamaged epoxy-coated bars.

Cut flush with the top flange or remove uncoated fasteners, anchors, lifting loops, or other protrusions into a bridge deck before casting the deck on prestressed concrete beams.

C.2 Splices

Splice as the plans show. Provide stainless steel couplers conforming to the minimum capacity, certification, proof testing, and written approval requirements of standard spec 550.3.3.4. The contractor may substitute stainless steel couplers for lap slices the plans show if the engineer approves in writing.

If increasing or altering the number or type of bar splices the plans show, provide revised plan sheets to the engineer showing the reinforcement layout, type, length, and location of revised bar splices and revised bar lengths. Obtain engineer approval for the location of

new lap splices or substitution of mechanical bar couplers before fabrication. Ensure that new lap splices are at least as long as those the plans show.

D Measurement

The department will not measure Bar Steel Reinforcement HS Stainless Structures. The department will use pay plan quantity conforming to standard spec 109.1.1.2. Plan quantities are computed from the nominal weights of corresponding sizes for carbon steel deformed bars in AASHTO M31 regardless of stainless steel alloy provided. The department will not measure extra material used if the contractor alters the reinforcement layout as allowed under C.2, extra material for splices or couplers the plans do not show, or the weight of devices used to support or fasten the steel in position.

The department will measure the Bar Couplers Stainless bid items as each individual coupler, acceptably completed.

E Payment

The department will pay for plan quantities conforming to standard spec 109.1.1.2 at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
505.0800.S	Bar Steel Reinforcement HS Stainless Structures	LB

Payment for Bar Steel Reinforcement HS Stainless Structures is full compensation for furnishing and placing stainless steel reinforcing bars, including supports. Where the plans specify bar couplers, the department will pay for the length of bars as detailed with no deduction or increase for installation of the coupler.

Payment for the Bar Couplers Stainless bid items is full compensation for providing couplers; including bar steel that is part of the coupler and not detailed in the plan; for threading reinforcing bars; for installing and coating the splice; and for supplying and testing 3 couplers.

505-005 (20141107)

42. Cleaning Decks.

Replace standard spec 509.3.3 (2)1 with the following:

Clean the entire surface of the bridge deck or approach pavement receiving the new concrete by using a suitable mechanical scarifyer. Accomplish this in a way that prevents hooking or tearing the reinforcing steel and that removes at least 1/2 inch of concrete from the deck or pavement surface but not more than the maximum depth the plans show.

43. Removing Asphaltic Concrete Deck Overlay B-40-400-1D, Item 509.9010.S.2001; B-40-400-6C, Item 509.9010.S.2003; B-40-400-6D, Item 509.9010.S.2004.

A Description
Remove the asphaltic concrete overlay with or without an underlayment of waterproof membrane by milling the entire bridge deck according to standard spec 204, the plans, and as hereinafter provided.

B (Vacant)

C Construction
C.1 Milling
Use a self-propelled milling machine that is specially designed and constructed for milling bridge decks. It shall mill without tearing or gouging the concrete masonry underlying the deck overlay. The machine shall consist of a cutting drum with carbide or diamond tip teeth. Space the teeth on the drum to mill a surface finish that is acceptable to the engineer.

Shroud the machine to prevent discharge of any loosened material into adjacent work areas or live traffic lanes. Equip the machine with electronic devices that provide accurate depth, grade and slope control, and an acceptable dust control system.

Perform milling in a manner that precludes damage to the bridge floor and results in a uniform textured finish that:

- Is free of sharp protrusions;
- Has uniform transverse grooves that measure up to ¼-inch vertically and transversely; and
- If applicable, is acceptable to the manufacturer of the sheet waterproof membrane.

Windrowing or storing of the removed milled asphaltic concrete on the bridge is only permitted in connection with the continuous removal and pick-up operation. During nonworking hours, clear the bridge of all materials and equipment.

C.2 Cleaning
Blast-clean the entire surface of the deck, the vertical faces of curbs, sidewalks, and parapets to the depth of the adjoining overlay.

Clean the surface on which the new overlay will be placed to remove all loose particles and dust by either brooming and water pressure using a high-pressure nozzle, or by water and air pressure. Use water for cleaning that conforms to specifications for water under standard spec 501.2.4.

The removed asphaltic concrete shall become the property of the contractor; properly dispose of it according to standard spec 204.

D Measurement
The department will measure Removing Asphaltic Concrete Deck Overlay in area 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
509.9010.S.2001	Removing Asphaltic Concrete Deck Overlay B-40-400-1D	SY
509.9010.S.2003	Removing Asphaltic Concrete Deck Overlay B-40-400-6C	SY
509.9010.S.2004	Removing Asphaltic Concrete Deck Overlay B-40-400-6D	SY

Payment is full compensation for removing the asphaltic concrete with or without an underlayment of waterproof membrane; cleaning the concrete surfaces; and for properly disposing of all materials.
509-010 (20110615)

44. Removing and Resetting Tubular Railing B-40-400-6C, Item 513.9005.S.2003; B-40-400-6D, Item 513.9005.S.2004.

A Description
Remove the tubular railing and posts from the existing bridge parapet, store them, and then reset them when the new parapet is complete, according to the plans, the pertinent requirements of the standard specifications, and as hereinafter provided.

B (Vacant)

C Construction
Remove the tubular railing and posts, taking care not to damage them. Store the tubular railing and posts in an area away from construction activities to preclude damage to them.

In the event that damage does occur to any item that is designated for re-use in the new work, repair or replace the damaged item at no expense to the department.

D Measurement
The department will measure Removing and Resetting Tubular Railing B-40-400-6C and Removing and Resetting Tubular Railing B-40-400-6D as a single complete 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
513.9005.S.2003	Removing and Resetting Tubular Railing B-40-400-6C	LS
513.9005.S.2004	Removing and Resetting Tubular Railing B-40-400-6D	LS

Payment is full compensation for removing the tubular railing and posts; properly storing the tubular railing and posts; and for resetting the tubular railing and posts.

513-090 (20100709)

45. Concrete Staining R-40-627, Item 517.1010.S.2001; R-40-628, Item 517.1010.S.2002; R-40-629, Item 517.1010.S.2003.

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 according 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 Concrete Stain Solid Color Water Based by Sherwin-Williams

C Construction

C.1 General

Furnish, prepare, apply, cure, and store all materials according 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 according 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 according 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 according to the plan.

D Measurement
The department will not measure Concrete Staining (Structure). The department will use pay plan quantity conforming to standard spec 109.1.1.2.

E Payment
The department will pay for plan quantities conforming to standard spec 109.1.1.2 at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
517.1010.S.2001	Concrete Staining R-40-627	SF
517.1010.S.2002	Concrete Staining R-40-628	SF
517.1010.S.2003	Concrete Staining R-40-629	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 (20140630)

46. Temporary Wall Wire Faced Mechanically Stabilized Earth, Item 532.0750.S.

A Description
This special provision describes designing, furnishing materials and erecting a temporary earth retention system according to the lines, dimension, elevations and details as shown on the plans and provided in the contract documents; including the design and construction of a temporary safety railing/barrier system according to current OSHA standards to protect the work site and removal of the temporary wall system when consolidation is complete. The temporary wall is being built above the proposed permanent Wall Wire Faced Mechanically Stabilized Earth LRFD (R-40-629) system as specified elsewhere in the contract documents to allow for the placement of surcharge material to a height of 2 feet above the proposed pavement grades above the permanent wall system.

B Materials
B.1 Proprietary Mechanically Stabilized Earth Wire Faced Wall Systems
The department specifies approved temporary wire faced mechanically stabilized earth wall products on the department's approved product list.

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 Development Section. The name of the companies supplying pre-approved material shall be furnished within 25 days after the award of contract. The department maintains a list of pre-approved systems of retaining walls. To be eligible for use on this project, a system requiring pre-approval must have been pre-approved and added to that list prior to the bid opening date.

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 according to the requirements of chapter 14 of the department's Bridge Manual. Information and assistance with the pre-approval process can be obtained by contacting the Structures Development 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 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 design of the Mechanically Stabilized Earth Wire Faced Wall shall be in compliance with the latest AASHTO Standard Specification for Highway Bridges including interim specifications, the standard specifications, and standard engineering design procedures as determined by the department.

The design life shall be three years, or the length of time the temporary wall will be in service, whichever is greater. A fine metallic screen or geotextile filter fabric shall be used at the front face of the wall to retain the fines of the soil mass. The maximum allowable stress in the reduced section of wire-faced walls after sacrificial steel has been removed at the end of the design life is 0.47. F_y, where F_y is the yield strength of the soil reinforcement. The minimum embedment of the MSE wire faced wall shall be 1 foot 6 inches, or as given in the plan, or as stated in AASHTO 5.8.1, whichever is greater. Frost depth shall not be considered. The overall vertical tolerance of the wall and the horizontal alignment tolerance shall not exceed 3 inches per 10 feet. For systems with separate components for soil reinforcement and wall panels, the force in the soil reinforcement at the face of the panel shall not exceed 0.5 of the connection strength failure load as determined by tests.

The design of the MSE Wire Faced Wall shall consider the internal stability of the wall mass, including reinforcement pullout resistance. The design shall be in compliance with the current AASHTO specifications for Mechanically Stabilized Earth Walls, except that 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. Design the walls for the heights shown on the plans, and include the effects of highway surcharge loading. If a traffic rail or parapet is detailed within 3 feet of the top of the wall, the soil reinforcement at the top of the wall shall be designed for an additional horizontal traffic load as given in AASHTO. If the wall is installed in front of a bridge abutment, it shall also be designed to resist the applied abutment/bridge lateral forces. 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 6 feet. The soil reinforcement shall extend 3 feet beyond the theoretical failure plane in all cases.

B.3 Wall System Components

B.3.1 Welded Wire Fabric

Provide welded wire fabric that is used to fabricate 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 according 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. Any geotextiles used in the construction of the wall and finally exposed to the sun shall be resistant to ultraviolet radiation for the design life of the wall.

B.3.2 Backfill

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 or other potentially corrosive material.

Provide material that conforms to the following gradation requirements.

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.

In addition, backfill material shall meet the following requirements.

Test	Method	Value
pH	AASHTO T-289	4.5 – 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.
Angle of Internal Friction	AASHTO T-236	30 degrees min.

Prior to placement of the backfill, obtain and furnish to the engineer current certified report of test results that the backfill material complies with the requirements of this specification. Tests will be performed by a certified independent laboratory. When backfill characteristics and/or sources change, a certified report of tests will be provided for the new backfill material.

B.3.3 Temporary Safety Rail/Barrier System.
Design and place the temporary safety rail/barrier system according to current OSHA standards to protect the work site. The temporary safety rail/barrier system shall remain in place until the temporary wall system is no longer needed.

C Construction
C.1 Methods
All excavation and preparation of the foundation for the reinforcing fabric shall be according 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. For walls with a maximum height greater than 6 feet, compact the backfill 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-foot layer per 200 feet of wall, or major portion thereof. A minimum of one test for every 2-foot layer 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. The cost of compaction testing shall be considered incidental to the cost of the wall.

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.

C.2 Geotechnical Information
Geotechnical data to be used in the design of the wall is given on the wall plan for R-40-629. The allowable soil bearing capacity is given on the plan. After completing the excavation of the entire reinforced zone, the department's Regional Soils Engineer shall inspect the site and determine if the foundation is adequate for the intended loads. Allow the Regional Soils Engineer two working days to perform the inspection.

D Measurement

The department will measure Temporary Wall Wire Faced Mechanically Stabilized Earth in area by the square foot of face on a vertical plane between the finished pavement section subgrade elevation and a point 2 feet above the finished pavement grades, calculated to be 37.5 inches, as shown in the plan details. Unless ordered by the engineer, wall area constructed above or below these lines will not 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
532.0750.S	Temporary Wall Wire Faced Mechanically Stabilized Earth	SF

Payment is full compensation for supplying a design and shop drawings; preparing the site, including all necessary excavation and disposal of materials; constructing the retaining system; constructing a temporary railing/ barrier system, providing backfill, backfilling and compacting; performing compaction testing; and removing and disposing of the temporary wall system to the finished pavement subgrade elevation when consolidation is complete.

47. Adjusting Manhole Covers.

This work shall be according to the pertinent provisions of standard spec 611, as shown on the plans, and as hereinafter provided.

Adjust manhole covers located in pavement areas in two separate operations. Initially, remove designated manhole covers along with sufficient pavement to permit installation of temporary cover plate over the opening. Fill the excavated area with asphaltic pavement mixture, which shall remain in place until contract milling and paving operations permit setting the manhole frames to grade. During the second phase, remove the asphaltic pavement mixture surrounding the manhole plus the temporary cover plate, and set the manhole cover to final grade. The department will measure and pay for the items of asphaltic pavement mixture, temporary cover plate, milling, and paving separately.

Revise standard spec 611.3.7 by deleting the last paragraph.

Set the manhole frames so that they comply with the surface requirements of standard spec 450.3.2.9. At the completion of the paving, a 6-foot straightedge shall be placed over the centerline of each manhole frame parallel to the direction of traffic. A measurement shall be made at each side of the frame. The two measurements shall be averaged. If this average is greater than 5/8 inches, reset the manhole frame to the correct plane and elevation. If this average is 5/8 inches or less but greater than 3/8 inches, the manhole frame shall be allowed to remain in place but shall be paid for at 50 percent of the contract unit price.

If the manhole frame is higher than the adjacent pavement, the two measurements shall be made at each end of the straightedge. These two measurements shall be averaged. The same criteria for acceptance and payment as above, shall apply.
611-005 (20030820)

48. 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, acceptably completed in place, as units.

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)

49. 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)

50. Landscape Planting Surveillance and Care Cycles.

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 $600 to cover the cost of performing the work with other forces. The department will assess these damages for each day the requirements of the care cycle remain incomplete, except when the engineer extends the required time period.
632-005 (20070510)

51. 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.

Add the following to standard spec 637.2.4:

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 A4-6 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 six 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, one-half 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.

Add the following to standard spec 637.3.3.2(2):

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.

Add the following to standard spec 637.3.3.3(3):

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.

Add the following to standard spec 641.2.9(3):

Submit shop drawings for sign bridges and overhead sign supports to SE Region, Traffic Operations Engineer

637-SER1 (20120401)
U: mounting hardware for type I and II signs revised 7-14-15

52. City of Milwaukee Date Stickers.

Add the following to standard spec 637.2.3.4 and 637.2.3.5:

Install City of Milwaukee date stickers on all signs on Lincoln Memorial Drive and on Clybourn Street. No date stickers shall be placed on street name signs for City of Milwaukee jurisdiction roadways. Signs on all exit and entrance ramps shall have WisDOT date and vandalism stickers. The City of Milwaukee will furnish the date stickers for contractor installed signs that are on the city jurisdiction roadways and WISDOT will furnish the WisDOT date stickers for contractor installed signs that are on WisDOT jurisdiction roadways

53. Overhead Sign Supports S-40-793, Item 641.8100.0001; S-40-794, Item 641.8100.0002; S-40-795, Item 641.8100.0003; S-40-796, Item 641.8100.0004; S-40-64, Item 641.8100.0005; S-40-642, Item 641.8100.0006; D-40-797, Item 641.8100.0007.

Add the following to standard spec 641.2.9 (5) and 641.3.4:

Provide a weather resistant polyester TGIC Powdered coating finish (or approved equal) over the galvanized finish on the assemblies. Color shall be RAL # 7032 in smooth matte finish furnished by Tiger Drylac or approved equal.

Submit color sample to Construction Project Manager for approval, and Tom Heydel, Traffic Operations (for information), prior to final selection. City of Milwaukee shall review the color sample to provide final approval to the construction project manager.

Submit overhead sign support structural drawings to Tom Heydel, WisDOT Traffic Operations.

54. 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 conforming to standard spec 109.1.1.2.

E Payment

The department will pay for plan quantities conforming to standard spec 109.1.1.2 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.

55. Freeway Lighting System – WisDOT Owned Systems.

General

Revise standard spec 651, 652, 653, 654, 655, 656, 657 and 659 as follows.

All the work necessary, including coordination, to comply with revisions to standards specifications modified in this article shall be incidental to associated pay items or to the project.

Add following to standard spec 651:

Materials indicated to be returned to the department shall be hauled to one of the following two locations:

1. State Electrical Shop at 935 South 60th street, West Allis, as directed by Mr. Mike Prebish, (414) 266-1170.
2. Milwaukee County Grounds, 10191 West Watertown Plank Road, Wauwatosa, as directed by Mr. Pat Stoetzel, (414) 750-5306.

Arrange pickups and deliveries three days in advance and during regular business hours (Monday – Thursday 7:00 AM to 3:45 PM).

Add the following to standard spec 651.3.1:

Consider any circuit that the contractor does not personally tag out at the disconnect to be live. Any circuit not tagged out may be activated by another person with no notice to the contractor. Make tagouts with manufactured tags, and endorse them with the date and the name of the contractor. Clear tagouts at the end of the workday. The department will not employ a load dispatcher. Each electrical worker is responsible for their own protection from automatic switching and from switching by others.

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.

Replace all existing slotted junction box cover screws with stainless hex head cover screws at each location where it is required to open the cover of an existing lighting junction box.

Add the following to standard spec 651:

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 freeway lighting pay items included in this contract. The department will not measure conductors or conduits that have been abandoned in place or removed for scrap. The department will allow, at the contractor's discretion, for the salvaging of conductors to be abandoned, if possible.

The department will not measure for the removal of electrical facilities; except, the department will measure and pay for the removal and disposal of lamps from sign bridges, as shown on the plans, using bid item Lamp Disposal High Intensity Discharge.

Add the following to standard spec 652.3.1:

Install minimum 3-inch diameter PVC conduit elbows in a ground mounted concrete bases to accommodate Cable in Duct (CID) type cable.

Add the following to standard spec 652.3.1.2:

Furnish and install an UL-listed liquid tight 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.

Add the following to standard spec 652.3.1.4:

Support conductors at the top of the vertical raceway or as close as practical if the vertical rise exceeds 40-feet. Provide additional supports as shown; in no case shall the distance between supports exceed that shown in Table 300.19(A) of the Wisconsin State Electric Code.

Add the following to standard spec 652.3.1.4:

Support conductors at the top of the vertical raceway or as close as practical if the vertical rise exceeds 40-feet. Provide additional supports as shown; in no case shall the distance

between supports exceed that shown in Table 300.19(A) of the Wisconsin State Electric Code.

Add the following to standard spec 653.3(1):

This provision modifies the standard detail drawing for pull boxes and thereby both the standard items and SPV pay item for pull boxes. Lighting pull box covers shall read "LIGHTING".

Replace standard spec 655.3.1 with the following:

Wet location splices are not anticipated on this project and not shown in the plans. In the event that the engineer allows wet location splices, make pull box splices with engineer approved epoxy kit.

At each pull point or access point, indicate the line side bundle with a lap of blue tape.

Add the following to standard spec 655.3.7(4):

Where two or more wire networks pass through a pull point, tag each circuit network (i.e. A/B/N and C/D/N) with approved all-weather tags.

Add the following to standard spec 657.2.1:

Non-breakaway poles (mounted on structures, concrete bases or behind noise wall barriers without transformer base), as well as at stems of sign bridges containing electrical wires are to be double nutted. Install galvanized rat screen that encloses the bottom of pole area; extra nuts and screen incidental.

For Bridge mounted light poles, include a vibration isolation mounting pad with the pole. The pad shall have the same shape as the bottom of the pole base with appropriate bolt holes and opening for the center of the pole. Included with the pad shall be four washers. The pad and washers shall be made from a rugged elastomeric material with a minimum thickness of 1/2 in (13 mm) or as recommended by the manufacturer. The ultimate breakdown of the pad and washers under compressive load shall be not less than 10,000 psi (69,000 kPa) for the specified thickness without extrusion or detrimental reduction in thickness. The material shall also have a Shore-A Durometer reading of not less than 85. Install the isolation washers with galvanized steel washers of the same diameter and adequate thickness top and bottom.

Add the following to standard spec 657.3.1 and standard spec 657.3.5:

Corrosion protection measures described in standard spec 657.3.1 and standard spec 657.3.5 are invoked for breakaway transformer bases and aluminum light poles. The contractor shall avoid contact of dissimilar metals in erecting the pole on its foundation

and/or breakaway device. Any concern of trapped moisture or potential corrosion cell shall be resolved to the satisfaction of the engineer.

Add the following to standard spec 659.3:

Vibration Testing: The contractor shall submit testing report for each type of luminaire complying vibration test ANSI C136.31 requirements. All luminaires mounted on a bridge structure and high mast luminaires shall be rated for "3G" minimum peak acceleration. The "3G" rated luminaire shall be provided with a grip or suitable device to hold the lamp against vibration. In order to be accepted, the luminaire housing, hardware, and each individual component shall pass this test with no noticeable damage and the unit must remain fully operational after testing.

Independent Testing: When a project has 30 or more luminaires of the same type, that luminaire type shall be independently tested. For each luminaire type requiring independent testing, one luminaire plus one additional luminaire for each additional 50 luminaires shall be tested. The contractor shall coordinate the independent testing and propose a qualified independent agent, familiar with the luminaire requirements and test procedures, for approval by the engineer, to witness the required tests as performed by the luminaire manufacturer.

The independent witness shall select from the project luminaires at the manufacturer's facility or at the contractor's storage facility, the luminaires for testing. In all cases, the selection of luminaires shall be a random selection from the entire completed lot of luminaires required for the contract. Selections from partial lots will not be allowed. The selection of the proposed independent witness (independent laboratory as required) shall be presented with the information submitted for approval. The testing performed shall include photometric and electrical testing.

Photometric testing shall be according to IES recommendations and as a minimum, shall yield an isofootcandle chart, with max candela point and half candela trace indicated, an isocandela diagram, maximum planned and maximum cone plots of candela, a candlepower table (House and street side), a coefficient of utilization chart, a luminous flux distribution table, BUG rating report, and complete calculations based on specified requirements and test results.

Electrical testing shall conform to NEMA and ANSI standards and, as a minimum, shall yield a complete check of wiring connections; a ballast dielectric test; a ballast transient voltage test; total ballast losses in watts and percent of input; a lamp volt-watt trace; regulation data; a starter test; lamp current crest factor; power factor (minimum over the design range of input voltage at nominal lamp voltage); and a table of ballast characteristics showing input amperes, watts and power factor, output volts, amperes, watts and lamp crest factor, as well as ballast losses over the range of values required to produce the lamp volt-watt trace. For LED luminaires provide a table of characteristics showing input amperes, watts, power factor, total harmonic distortion and LED drive current.

The summary report and the test results shall be certified by the independent test laboratory or the independent witness, as applicable, and shall be sent by certified mail directly to the engineer. A copy of this material shall be sent to the contractor at the same time. Should any of the tested luminaires of a given distribution type and wattage fail to satisfy the specifications and perform according to approved submittal information, the luminaire of that distribution type and wattage shall be unacceptable and be replaced by alternate equipment meeting the specifications with the submittal and testing process repeated in their entirety; or corrections made to achieve required performance. In the case of corrections, the contractor shall advise the engineer of corrections made and shall request a repeat of the specified testing and, if the corrections are deemed reasonable by the engineer, the testing process shall be repeated. The number of luminaires to be tested shall be the same quantity as originally tested.

Submittal information shall include a statement of intent to provide the testing as well as a request for approval of the chosen laboratory.

Testing Documentation Requirements: Certified test reports with the above results shall be supplied for each shipment. Certified test reports shall include the following identification information:

1. Manufacturer's name
2. Type of luminaires
3. Quantity of luminaires
4. A copy of shipping ticket
5. Manufacturer's lot number

Preparation for Delivery: Luminaires shall be packaged in accordance with the standard commercial practices in the industry. Each shipping container shall be clearly marked to indicate contents, the manufacturer, manufacturing date, make, model, electrical ratings, purchase order number and contract number.

Manufacturer's Warranty for LED luminaires: The manufacturer shall warrant to the Department that each complete luminaire (consisting of the housing, optical assembly, LED drivers, surge protection and wiring) will be free from defects in material and workmanship for five years from the date that the luminaire are put into service. Luminaires shall be installed within one year of manufacture.

If any luminaires fail to meet the above warranty, the department shall provide the manufacturer with a written notice of any defect within 30 days after discovery of the defect. The manufacturer shall provide all materials, luminaires, replacement component parts, labor and all incidentals necessary to restore the luminaire to a fully operational, installed condition.

Submittal Requirements for LED luminaires: Considering the rapid advancement in LED technology, the overall project construction and duration of construction, within 10 calendar days after contract execution, the contractor is responsible to coordinate the lead

time for LED luminaires purchase and installation schedule for LED luminaires with the engineer and the Department's Lighting Engineer, Eric Perea, at eric.perea@dot.wi.gov or at (262) 548-8778 prior to order LED luminaires. The LED luminaires purchasing may be done during later stage of construction as directed by the Department which shall not delay the construction.

Add the following to standard spec 659.3:

Install Plaques Light Pole on all poles located in the median at a mounting height of 6-inch above the highest adjacent safety barrier or obstruction.

High mast tower luminaires shall be LED

Add the following to standard spec 659.3.1:

Contractor shall be responsible to provide adequate temporary roadway lighting during all the construction stages not shown on the temporary lighting plans, but which are necessitated by field conditions or by any construction phasing changes. Installation of temporary lighting not shown on temporary lighting plans shall be paid according to appropriate pay items included in this contract. Contractor shall be responsible to submit a redline markup plans for any additional temporary lighting to the engineer for approval prior to installation.

56. Roadway Lighting System – City of Milwaukee Owned Systems.

General Requirements.
Work under items related to the street lighting system shall conform to the National Electrical Code (NEC), 2011 Edition, or the latest edition adopted by the State of Wisconsin, Wisconsin Department of Commerce Chapter SPS 316 (Electrical) State of Wisconsin electrical code, and these special provisions and good electrical practices. The contractor shall not take advantage of lack of details in plans or these specifications where to do so would conflict with the applicable code and standards.

An electrician holding all appropriate licenses (including City of Milwaukee Licenses) shall supervise all work done referring to the street lighting system. All splices shall be made by an electrician. For the purpose of this contract, an electrician is a person who served a four year apprenticeship and passed state exams.

The various items related to electrical construction shall read and be applied as a whole. Where the material, construction methods, or other specifications of one item could reasonably be applied to another item so as to construct a system of highest quality, the contractor shall do so.

If proposed location for a street lighting unit should happen to be in conflict with an underground utility and/or other obstacle, it may be necessary to move the unit 5 feet in either direction. Any change more than 5 feet must be approved by the engineer. The engineer must approve any changes in setback from curb face.

All purpose anti-seize (or equivalent) is to be applied on all bolts and screws, especially the street lighting pedestal and hand hole panel on street light pole.

Oxide inhibitor OX-4 (or equivalent) is to be applied on all wire connections (aluminum or copper) and wire nuts.

After the city make preliminary acceptance of the street lighting system, it shall be monitored by the City of Milwaukee, Street Lighting Electrical Services during a 30 calendar day operational "burn in". Final acceptance of the lighting system will be based on its meeting standard operational criteria as stated in these specifications. The contractor shall be responsible for all necessary repairs and adjustments to the lighting system to meet standard operational criteria.

Plan changes must be approved by the City of Milwaukee. The primary contacts are Mr. Dennis Miller (414) 286-5942-office, (414) 708-4251-cell for field operations; or Mr. Eng-Kie Lee (414) 286-2174 for engineering.

Material List.
All materials furnished under this contract for street lighting installation are subject to approval by Street Lighting division.

The contractor shall furnish a complete list of materials to be furnished and used for street lighting. Such list shall include names and addresses of manufactures, together with catalog numbers, invoice (for warranty purpose), certificates of compliance, specifications, and other product information requests by the engineer. The list shall be submitted within ten calendar days of execution of contract. No material shall be incorporated into the lighting system prior to the written approval of the engineer. Approval does not change the intent of the specifications. The contractor shall not substitute or make changes in material without resubmitting for approval.

Collect all the manufacturers' warranties documented on manufacturer's letterhead, signed by the manufacturer's principle, documenting said warranties or guarantees, any third party warranties and limits of liabilities. Submit complete warranty package including all the manufacturers' warranties to the engineer and City of Milwaukee lighting engineer before final system acceptance.

57. Conduit Rigid Nonmetallic Schedule 40 2-Inch, Item 652.0225; Schedule 40 2 ½-Inch, Item 652.0230; Schedule 40 3-Inch, Item 652.0235.

This work consists of furnishing and installing PVC conduits according to standard spec 652, and as shown in the plan details. All work shall be according to standard spec 651.

Locations of the conduits where they are required are identified in the plans. However, installation will require integration with existing field conditions. If the field conditions are such that the pipes cannot be installed at the specified locations, appropriate adjustments to

conduit locations may be made. Any adjustment of greater than five feet must be approved by the engineer.

Field design changes must be approved by the City of Milwaukee Electric Services Supervisor. The primary contacts are Mr. Dennis Miller, Street Lighting Supervisor, (414) 286-5942 office, (414) 708-4251 mobile; or Mr. George Berdine, Street Lighting Supervisor, (414) 286-5943 office, (414) 708-4245 mobile.

58. Traffic Signal and Street Lighting Conduit Box-Outs.

The labor associated with construction of the 2.5-foot x 2.5-foot concrete sidewalk box outs shown on the traffic signal conduit and street lighting conduit plans for street light poles, signal standards, and/or conduit junction boxes will be paid for under concrete sidewalk bid items.

59. 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 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)

60. Concrete Base Type 10, Item 654.0110.

Replace standard spec 654.2 (4) with the following:

Contractor shall supply templates, anchor rods, nuts, and washers for installation as shown on the plans.

Contact City of Milwaukee sewer engineering five working days prior to excavating any concrete bases at (414) 286-2467 to confirm lateral clearance with sewer facilities.

61. Concrete Base Type 13, Item 654.0113.

Replace standard spec 654.2 (4) with the following:

Contractor shall supply templates, anchor rods, nuts, and washers for installation as shown on the plans.

Contact City of Milwaukee sewer engineering five working days prior to excavating any concrete bases at (414) 286-2467 to confirm lateral clearance with sewer facilities.

62. Electrical Service Meter Breaker Pedestal, Intersection of Lincoln Memorial Dr and IH 794 Ramps, Item 656.0200.5001; Intersection of Lincoln Memorial Dr and Clybourn St, Item 656.0200.5002; Intersection of Lincoln Memorial Dr and Michigan St, Item 656.0200.5003; Intersection of Clybourn St and Van Buren St, Item 656.0200.5004.

Add the following to standard spec 656.3.4:

The contractor shall be responsible for electrical service installation or relocation requests. The City of Milwaukee will be responsible for any charges from We Energies. Electrical utility company service installation or relocation and energy cost shall be billed to and paid for by the maintaining authority.

Install the cabinet base and meter breaker pedestal first, so the electrical utility company can install the service lateral. Finish grade the service trench, replace topsoil that is lost or contaminated with other materials.

Add the following to standard spec 656.5(3):

Payment is full compensation for grading the service trench and replacing topsoil; and for fertilizing, seeding, and mulching to restore the disturbed area of the service trench if necessary.

63. 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 according 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)

64. Traffic Signal Face, 12 Inch.

Add the following to standard spec 658.2.4:

All Light Emitting Diode (LED) traffic signal modules shall meet the Final Approved Version of the LED Circular Signal Supplement Purchase Specification produced by ITE. The manufacturer shall provide the minimum warranty as stated in the ITE Specifications. If the LED fails to function as intended due to workmanship or material defects within the first 60 months from delivery, replace or repair the LED at no cost to the department. If the LED signal modules exhibit luminous intensities less than the minimum values specified within the first 36 months, replace or repair the LED at no cost to the department.

All signal head assemblies shall be equipped with LED, cutaway visors, and backplates. The visor and backplate shall be a dull black.

Vehicular signal indications shall be 12-inch LED modules as indicated on material list. All faces shall give an appearance of an incandescent lamp. The signal face shall be an 18 count Dialight DuraLED signal or approved equal.

65. Pedestrian Push Buttons, Item 658.0500.

Add the following to standard spec 658.2.5:

Furnish vandal resistant, pressure activated, pedestrian push buttons, with die cast body type, in unfinished aluminum or yellow. Push button shall be constructed of stainless steel, with a Piezo driven solid state switch, momentary LED display and beeper that sounds when with button pushed.

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.

66. Programmable Traffic Signal Faces.

Replace standard spec 658.2.4:

(1) Furnish programmable traffic signal faces with incandescent illumination sources conforming to the following:

- Programming through the use of a Fresnal lens and a smaller clear lens. Masked-off portions of the smaller lens control which signal faces each lens sees during approach.
- Signal sections can be tilted in two-degree increments for a maximum of ten degrees above or below the horizontal axis while still maintaining a common vertical axis.
- Signal heads shall have automatic dimming circuits to adjust light output according to environmental conditions.

(2) Programmable traffic signal indications shall be manufactured by McCain Inc.

67. Intelligent Transportation Systems (ITS) – Control of Materials.

Standard spec 106.2 – Supply Source and Quality
Add the following to standard spec 106.2:

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

Department-Furnished Items
72-Count Fiber Optic Cable
6-Count Fiber Optic Cable
Fiber Optic Splice Enclosures
Fiber Optic Termination Panels
CCTV Cameras
CCTV Camera Cabinets
Ethernet Switches

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 representative at (414) 225-3723 to coordinate pick-up of equipment.

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
Add the following to standard spec 106.3:

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:

1. Mounting assemblies for the vehicle speed and classification sensors, including their attachment to the structure.
2. Mounting LED warning signs to the sign structure.
3. Mounting detail for dynamic message signs.
4. 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)

68. 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.4 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.5 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.6 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)

69. 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 Ethernet Switch by the unit, installed according 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 installing an Ethernet switch; furnishing all necessary incidental hardware; and making all necessary connections.
675-040 (20100630)

70. Crack and Damage Survey US Bank Parking Structure 716 E Clybourn Street, Item 999.1500.S.0001; Milwaukee County Transit Center 909 E Michigan, Item 999.1500.S.0002.

A Description
This special provision describes conducting a crack and damage survey of the buildings / structures located along the west side of Clybourn Street between Van Burn Street and Lincoln Memorial Drive. The buildings include:

1. U.S. Bank Parking Structure
   716 E. Clybourn Street

2. Milwaukee County Transit Center
   909 E. Michigan

This Crack and Damage Survey shall consist of two parts. The first part, performed prior to construction activities, shall include a visual inspection, photographs, and a written report describing the existing defects in the building(s) being inspected. The second part, performed after the construction activities, shall also include a visual inspection, photographs, and written report describing any change in the building's condition.

B (Vacant)

C Construction
Prior to any construction activities, thoroughly inspect the building structures for existing defects, including interior and exterior walls. Submit a written report of the inspector's name, date of inspection, descriptions and locations of defects, and photographs. The intent of the written report and photographs is to procure a record of the general physical

condition of the building's interior and exterior walls and foundation. The report shall be typed on bond paper and be in text form.

The photographs shall be taken by a professional photographer capable of producing sharp, grain free, high-contrast colored pictures with good shadow details. The photographs shall be 3½ inch by 5 inch color prints, glossy, and mounted in protective storage pages with clear slip-in pockets and clear background. Each sheet shall hold four prints. The back of each photograph shall contain the following information:

ID _____
Building Location _____
View looking _____
Date _____
Photographer _____

Prior to the start of any construction activities pertinent to this survey, submit a copy of the written report and photographs to the engineer.

After the construction activities are complete, conduct another survey in the same manner, take photographs, and submit another written report to the engineer.

In lieu of photographs, a professional videographer may be hired to use a video camera capable of producing a video with the clarity required to perform this work.

D Measurement

The department will measure Crack and Damage Survey (Location) as 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
999.1500.S.01	Crack and Damage Survey, US Bank Parking Structure 716 E Clybourn St	LS
999.1500.S.02	Crack and Damage Survey, Milwaukee County Transit Center 909 E Michigan	LS

Payment is full compensation for providing the before and after written reports, and for photographs or video.

999-010 (20130615)

71. Backfill For Plant Beds – 24 Inch Depth, Item SPV.0035.1001.

A Description

This special provision describes furnishing and installing Plant Bed Backfill – 24-Inch Depth as shown on the plans, and as hereinafter provided. Construction work includes the excavation and removal of existing material and placement of new plant bed backfill mix.

B Materials
Plant Bed Backfill – 24-Inch Depth shall be a blended mix consisting of the following ingredients and ratios:

70% topsoil as defined in standard spec 625.2 (1)
30% compost as defined in standard spec 632.2.3.1

Provide fertilizer at levels for trees, shrubs and perennial plants as recommended by soil analysis.

Plant Bed Backfill – 24-Inch Depth shall be free of debris, rocks larger than ½-inch and having a pH range of 5.5 to 6.5.

Product Data: Submit data on topsoil and compost used in Plant Bed Backfill – 24-Inch Depth to engineer, for approval prior to construction.

C Construction
The installation of the Plant Bed Backfill – 24-Inch Depth shall be according to the plans and details. Install backfill to a minimum depth of 24-inches, but not less than required to meet finish grades after natural settlement. Scarify subgrade and thoroughly blend backfill off-site before spreading. Do not spread backfill if planting soil or subgrade is frozen, muddy or excessively wet. Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges and fill depressions to meet finish grades.

D Measurement
The department will measure Plant Bed Backfill – 24-Inch Depth by the cubic yard of material, acceptably completed. No separate measurement will be made for excavation necessary to accommodate plant bed backfill.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.1001	Plant Bed Backfill – 24-Inch Depth	CY

Payment is full compensation for excavation and removal of existing material; and furnishing and delivering all Backfill for Plant Beds.

72. Structural Soil at Street Trees, Item SPV.0035.1002.

A Description
This special provision describes furnishing and installing structural soil backfill material capable of providing adequate support for paving and being suitable for promoting tree and shrub growth as shown on the plans, and as hereinafter provided. Construction work

includes the excavation and removal of existing material and placement of the new structural soil backfill material.

B Materials

Structural Soil: A uniformly blended mixture of clay loam, crushed stone, and hydrogel, mixed to the following proportion:

Material	Unit of Weight
Clay Loam	As determined by mix test (Approx. 20 units)
Crushed Stone	100 units dry weight
Hydrogel	0.03 units dry weight
Total moisture	ASTM D1557 optimum moisture

Determine initial mix design for testing by adjusting ratio between crushed stone and clay loam (see Appendices I and II). Adjust final mix dry weight mixing proportion to decrease soil in mixture if CBR test results fail to meet acceptance (CBR # 50).

Clay Loam

Clay loam shall be a "loam" based on NCRS soil texture classification system as determined by mechanical analysis (ASTM D422) and it shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than one-half inch, lumps, plants and their roots, debris, and other extraneous matter over 1-inch in diameter or excess of smaller pieces of same materials as determined by engineer. It shall not contain toxic substances harmful to plant growth. Obtain clay loam from naturally well-drained areas, which have never been stripped of topsoil before and have a history of satisfactory vegetative growth. Clay loam shall contain not less than 2 or more than 5 percent organic matter as determined by loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F., plus or minus 9 degrees.

Mechanical analysis for a loam/clay loam shall be as follows:

NCRS Textural Class	Percent of Total Weight
Gravel	less than 5
Sand	20 - 45
Silt	20 - 50
Clay	20- 40

Chemical analysis: Meet or be amended to meet the following criteria.

- pH between 5.5 to 6.5.
- Percent Organic Matter: 2 – 5 percent by dry weight.

- Nutrient levels as required by testing laboratory recommendations for type of plants to be grown in soil.

- Toxic elements and compounds below U.S. Environmental Protection Agency Standards for Exceptional Quality sludge or local standard; whichever is more stringent.

- Soluble salt less than 1.0 millimho per cm.

- Cation Exchange Capacity (CEC): Greater than 10.

- Carbon/Nitrogen Ratio: Less than 33:1.

Clay loam shall be product of a commercial processing facility specializing in production of stripped natural topsoil. No topsoil shall come from NCRS-classified prime farmland.

Crushed Stone
Crushed Stone shall be department certified crushed stone. 90 - 100 percent of stone shall pass 1-1/2-inch sieve, 20-55 percent shall pass 1-inch sieve and 10 percent should pass 3/4-inch sieve. A ratio of nominal maximum to nominal minimum particle size of 2 is required.

Acceptable aggregate dimensions shall not exceed 2.5:1.0 for any two dimensions chosen.

Minimum 90 percent with one fractured face, minimum 75 percent with two or more fractured faces.

Results of Aggregate Soundness Loss test, ASTM C88, shall not exceed 18 percent.

Losses from LA Abrasion tests, ASTM C131, shall not exceed 40 percent.

Hydrogel
Water absorbent synthetic polymer which may be potassium-based and/or cross linked.

A. Amereq Corporation – Gelscape; http://www.amereq.com/; (800) 832-8788.
B. JRM Chemical Inc. – Soilmoist; http://www.soilmoist.com/; (800) 962-4010
C. Aquatrols Corporation – Supersorb; http://aquatrols.com/; (800) 257-7797.
D. Or approved equal.

Fertilizer
Provide commercial fertilizer complying with state and federal fertilizer laws. Deliver fertilizer in original unopened containers bearing manufacturer's certificate of compliance covering analysis. Furnish certificate to engineer. Formulate fertilizer for mixing into soil and certified by manufacturer to provide controlled release of nitrogen continuously for a period of no less than 9 months and no more than 12 months.

Fertilizer percentages of weight of ingredients and application rates shall be as recommended by soil testing results.

Sulfur
Sulfur shall be commercial granular, 96 percent pure sulfur, delivered in containers with name of manufacturer, material, and analysis appearing on container.

Sulfur used to lower soil pH above 6.5 shall be ferrous sulfate formulation.

Lime
Agricultural limestone containing a minimum of 85 percent carbonates.

Minimum gradation: 100 percent passing 10 mesh sieve; 98 percent passing 20 mesh sieve; 55 percent passing 60 mesh sieve; and 40 percent passing 100 mesh sieve.

Water
Contractor shall be responsible to furnish his own supply of water to site at no extra cost. Work injured or damaged due to lack of water, or use of too much water, shall be contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

B.1 References:
AOAC International (AOAC); AOAC International Website.

- Official Methods of Analysis.

ASTM International (American Society for Testing and Materials)

- ASTM C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Sized Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
- ASTM C131 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- ASTM D422 – Test Method for Particle-Size Analysis of Soils.
- ASTM D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
- ASTM D1883 - Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils.

ISRIC - World Soil Information (ISRIC); ISRIC Website.

- Technical Paper 9 – Procedures for Soil Analysis.
- United States Department of Agriculture –Natural Resources Conservation Service (NCRS);
    - Acres of Prime Farmland.
    - Soil Texture Calculator.

B.2 Submittals

At least 30 days prior to ordering materials, contractor shall submit representative samples, certificates, manufacturer's literature and certified tests for materials specified within this Section to engineer.

Delivered materials shall closely match approved samples. The engineer will review and approve required samples based on certificates, manufacturer's literature, and test results.

Approval shall not constitute final acceptance. The engineer reserves right to reject, on or after delivery, any material not meeting these specifications.

Take samples randomly throughout field or stockpile at locations as directed by the engineer and package in presence of the engineer.

Contractor shall deliver samples to testing laboratories and have test results sent directly to the engineer. Label samples including location of source of material, date of sample, and contractor's name.

Testing laboratory shall use one sample for testing purposes. Submit second sample of clay loam and structural soil to the engineer at same time as test analysis as a record of soil color and texture.

Submit measured dry-weight percentage of stone in mixture.

Approved structural soil samples shall be standard for each lot of 500 cubic yards of material.

No additional payments will be made for testing and analysis. Include the costs associated with testing and analysis in the Structural Soil at Street Trees bid item

Maintenance Instructions:

- Prior to final acceptance of the work, submit maintenance instructions for use, removal and replacement of structural soil for licensor's use.
- Instructions will be reviewed by the engineer as a pre-condition for final acceptance of the work.

Submit a proposed plan and vertical section layout of structural soil to the engineer for review.

Submit one cubic foot sample per each 500 cubic yards of required material, and for each sample, the following analysis for crushed stone. The engineer shall approve soil testing laboratory.

Refer to Part C Construction for more information on required samples, testing, quality control and Structural Soil mix requirements.

Provide manufacturers analysis of the following:

- Loose and rodded unit weight.
- Bulk specific gravity and absorbency.
- Stone dimension and surface texture description.
- Documentation of acceptance for use as WISDOT approved aggregate.

Submit one pound sample of each type of fertilizer and three certificates showing composition and analysis. Submit purchase receipt for each fertilizer showing total quantity purchased for project prior to installation.

Submit Landscape or Pavement Material Contractor's qualifications outlining projects of similar quality, schedule requirements and construction detailing over last five years.

Qualifications shall include names of all similar projects, year completed, location, description of scope of work including types and quantities of planting mix/pavement material installed and name, address and telephone number of owner or owner's representative.

C Construction

Mix Design

Prepare sample structural soil mixes to determine ratio of mix components. Submit to the engineer for approval.

Submit samples and test results of each mix component to the engineer for approval. Based on samples and analysis of mix components. The engineer and contractor will jointly determine a mix ratio to be tested for conformance with requirements of specifications. For structural soil quantities greater than 500 cubic yards, test mix ratio for each clay loam or crushed stone where testing indicates a significant difference in physical analysis of clay loam or crushed stone as determined by the engineer.

The engineer may request testing of additional structural soil mix ratio samples if further refinement of mix is necessary.

Submit to the engineer proposed fertility amendment recommendations including amounts and types of fertilizers and pH adjustments for each mix ratio. Include fertility adjustments as part of mixing process.

Soil Mixing and Quality Control Testing

Obtain pre-mixed, certified Structural Soil at Street Trees or perform structural soil mixing at contractor's yard using appropriate soil measuring, mixing and shredding equipment of sufficient capacity and capability to assure proper quality control and consistent mix ratios. No mixing of structural soil at project site shall be permitted. Portable pugging may be used.

Maintain adequate moisture content during mixing process. Soils and mix components shall easily shred and break down without clumping. Soil clods shall easily break down

into a fine crumbly texture. Soils shall not be overly wet or dry. Contractor shall measure and monitor amount of soil moisture at mixing site periodically during mixing process.

Mixing procedure for front-end loader shall be as follows:

- On a flat asphalt or concrete paved surface, spread an 8 to 12-inch layer of crushed stone.
- Spread specified amount of dry hydrogel evenly over stone.
- Spread a proportional amount of clay loam over dry hydrogel and crushed stone according to mix design.
- Blend entire amount by turning, using a front-end loader or other suitable equipment until producing a consistent blend.
- Add moisture gradually and evenly during blending and turning operation as required to achieve required moisture content. Delay applications of moisture for 10 minutes prior to successive applications. Once established, mixing should produce a material within 1 percent of optimum moisture level for compaction.

Pugging operation mixing procedure shall be as follows:

- Feed a known weight of crushed stone into mixing trough.
- Add hydrogel slurry into trough and mix slurry and stone into a uniform blend.
- Meter in soil in proper proportion of clay loam soil while stone-slurry mixture is in motion.
- Add water to bring mixture to target moisture content after factoring in water from slurry and clay-loam moisture a portable pugging operation.

Add soil amendments to alter soil fertility including fertilizers and pH adjustment at time of mixing at rates recommended by soil test.

Adjust soil pH to fall within a value of 5.5 and 6.5 two months after mixing if material is stored, unless mixing with a high pH stone. Adjust soil component carbon/nitrogen ratio to be less than 33:1 within two months after mixing and prior to pavement being laid. Once pavement is laid, no adjustment shall be performed.

Mix sufficient material in advance of time needed at job site to allow adequate time for final quality control testing as required by progress of the work. Store structural soil in piles of approximately 500 cubic yards and number each pile for identification and quality control purposes. Protect storage piles from rain and erosion by covering with plastic sheeting.

During mixing process, contractor shall take two 1 cubic foot quality control samples per 500 cubic yards of production from final structural soil. Take samples from random locations in numbered stockpiles as required by this specification. Test each sample for particle size analysis and chemical analysis as described above. Submit results directly to engineer for review and approval.

Quality control sample clay loam/crushed stone ratio's shall be no greater or less than 2 percent of approved test sample as determined by splitting a known weight of oven dried material on a No. 4 sieve. In the event that quality control samples vary significantly from approved structural soil sample, as determined by engineer, remix and retest any lot of soil that fails to meet correct analysis, adjusting mixing ratios and procedures to achieve approved consistency.

C.1 Underground Utilities and Subsurface Conditions
Notify engineer of any subsurface conditions which will affect contractor's ability to complete the work

Locate and confirm location of underground utility lines and structures prior to starting any excavation.

Repair any underground utilities or foundations damaged by contractor during progress of this work. No additional payments will be made by the department for the cost of repairs.

C.2 Site Preparation
Do not proceed with installation of structural soil material until walls, curb footings and utility work in area have been installed. For site elements dependent on structural soil for foundation support, postpone installation until immediately after installation of structural soil.

Excavate and compact proposed sub-grade to depths, slopes and widths as shown on the plans. Maintain required angles of repose of adjacent materials as shown on the plans. Do not over excavate compacted subgrades of adjacent pavement or structures.

Confirm that subgrade is at proper elevation and compacted as required. Slope subgrade elevations parallel to finished grade and or toward subsurface drain lines as shown on the plans.

Clear excavation of construction debris, trash, rubble, and any foreign material. In the event that fuels, oils, concrete washout silts, or other material harmful to plants have been spilled into subgrade material, excavate soil sufficiently to remove harmful material. Fill any over excavation with approved fill and compact to required subgrade compaction.

Do not proceed with installation of structural soil until utility work in area has been installed. Adjacent subsurface drainage systems shall be operational prior to installation of structural soils.

Protect adjacent walls, walks, and utilities from damage or staining caused by soil. Use 1/2-inch plywood or plastic sheeting as directed to cover existing concrete, metal, and masonry work and other items as directed during progress of the work.

Clean up trash and any soil or dirt spilled on any paved surface at end of each working day.

Any damage to paving or architectural work caused by soils installation shall be repaired. The department will not make any additional payments to repair paving or architectural work damaged by soil or dirt.

Maintain silt and sediment control devices required by applicable regulations. Provide adequate methods to assure that trucks and other equipment do not track soil from site onto adjacent property and public right-of-way.

C.3 Installation of Structural Soil Material

Install structural soil and compact in 6 to 8 inch lifts to full depth, including where trees and plants will be placed. Compact final lift along with adjacent aggregate fill to create a level paving surface.

Compact materials to 95 percent modified Proctor density. No compaction shall occur when moisture content exceeds maximum as specified.

Bring structural soils to finished grades as shown on Drawings. Immediately protect structural soil material from contamination by toxic materials, trash, debris, water containing cement, clay, silt, or materials that will alter particle size distribution of mix with plastic or plywood as directed by engineer.

Install trees after structural soil has been placed. Dig pit for root ball with a backhoe operated from street in order to protect pavers. If the steepness of the tree pit causes the structural soil to fail, re-compact soil before continuing the installation. Set trees on ball of compacted or undisturbed subgrade pedestal as shown in the plans.

After tree is installed, backfill hole with structural soil and re-compact. Hand tamp area directly over root ball to avoid damage to tree. Compact other areas with a hand-held plate compactor.

For ornamental grasses and shrubs within cast-in-place concrete Salt Lip Curb Planters and long precast concrete planter at Clybourn Street, provide backfill for plant beds in minimum typical planting depth of 12 inches on top of resultant 24” minimum depth of structural soil. Where ornamental grasses or shrubs are adjacent to a tree, backfill structural soil and compact to allow for backfill for plant beds to be added to create planting bed at top 12-inch layer.

Provide permeable filter fabric below ornamental grass and shrub roots, between backfill for plant beds and structural soil. In no way should filter fabric be used to restrict tree roots from structural soil or prevent water to infiltrate down into the soil layers.

Do not leave structural soil exposed during winter. Cover open areas with tarps and plywood.

The engineer may periodically check material being delivered and installed at site for color and texture consistency with approved sample provided by contractor as part of submittal for structural soil.

C.4 Fine Grading

After initial placement and rough grading of structural soil but prior to start of fine grading, contractor shall request review of rough grading by the engineer. Contractor shall set sufficient grade stakes for checking finished grades.

Adjust finish grades to meet field conditions as directed.

Provide smooth transitions between slopes of different gradients and direction.

Fill dips and remove any bumps in overall plane of slope.

Tolerance for dips and bumps in structural soil areas shall be a three inch deviation from plane in 10 feet.

The engineer shall inspect and approve fine grading prior to installation of other items to be placed on structural soil.

C.5 Acceptance Standards

The engineer will inspect the work upon request by contractor. The engineer shall receive request for inspection at least 10 days before anticipated date of inspection.

C.6 Cleanup

Upon completion of structural soil installation operations, thoroughly clean areas within the project limits.

Remove excess fills, soils, and mix stockpiles and legally dispose of waste materials, trash and debris.

Remove tools and equipment and provide a clean, clear site.

Do no washing of adjacent surfaces until finished materials covering structural soil material are in place.

D Measurement
The department will measure Structural Soil at Street Trees by cubic yard of material, acceptably completed. No separate measurement will be made for excavation necessary to accommodate structural soil fill.

E Payment
The department will pay for measured quantities at contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.1002	Structural Soil at Street Trees	CY

Payment is full compensation for excavation and removal of existing material, furnishing and delivering all Structural Soil Backfill for Street Trees; samples, filter fabric, contractor submittals, and testing.

73. Decorative Stone Mulch, 3-Inch, Item SPV.0035.1003.

A Description
This special provision describes furnishing and installing Decorative Stone Mulch, 3-Inch as shown on the plans, and as hereinafter provided. Construction work includes the excavation and removal of existing material and placement of new decorative stone mulch.

B Materials
Decorative Stone Mulch, 3-Inch shall be Midnight Blue Granite, 3/4-Inch as manufactured by Kafka Granite LLC (800-852-7415), or approved equal from the following:

1. Lemke Stone, Inc. (www.lemkestone.com)
2. Midwest Decorative Stone and Landscape Supply (www.midwestdecorativestone.com)
3. County Materials (www.countymaterials.com)
4. Approved equal.

Samples: At least 30 days prior to ordering materials, provide minimum 5 lb. sample of Decorative Stone Mulch, 3-Inch illustrating color and aggregate size to the engineer, for approval prior to construction.

C Construction
Deliver clean stone mulch to the project site and install as called for on the drawings at the locations shown. Level stone surface and match to adjacent pavement or landscape grades.

D Measurement
The department will measure Decorative Stone Mulch, 3-Inch by the cubic yard, 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.0035.1003	Decorative Stone Mulch, 3-Inch	CY

Payment is full compensation for furnishing and installing the stone mulch, leveling the stone surface, and cleaning any stone from the surrounding surfaces.

74. Decomposed Granite Stone Mulch, 3-Inch, Item SPV.0035.1004.

A Description

This special provision describes furnishing and installing Decomposed Granite Stone Mulch, 3-Inch as shown on the plans, and as hereinafter provided. Construction work includes the excavation and removal of existing material and placement of new decorative stone mulch.

B Materials

Decomposed Granite Stone Mulch, 3-Inch shall be Red Cedar Granite 3/8" – Screenings as manufactured by Kafka Granite LLC, (800) 852-7415, or approved equal from the following:

1. Lemke Stone, Inc. (www.lemkestone.com)
2. Midwest Decorative Stone & Landscape Supply (www.midwestdecorativestone.com)
3. County Materials (www.countymaterials.com)
4. Approved equal.

Samples: At least 30 days prior to ordering materials, provide minimum 5 lb. sample of Decomposed Granite Stone Mulch, 3-Inch illustrating color and aggregate size to the engineer, for approval prior to construction.

C Construction

Deliver stone mulch to the project site and install as called for on the drawings at the locations shown. Level stone surface and match to adjacent pavement or landscape grades.

D Measurement

The department will measure Decomposed Granite Stone Mulch, 3-Inch by the cubic yard, 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.0035.1004	Decomposed Granite Stone Mulch, 3-Inch	CY

Payment is full compensation for furnishing and installing the stone mulch, leveling the stone surface, and cleaning any stone from the surrounding surfaces.

75. Drainage Blanket, Item SPV.0035.1005.

A Description
This special provision describes furnishing and placing granular backfill within the limits shown on the plans and as directed by the engineer.

B Materials
The granular backfill for the drainage blanket shall meet the requirements of standard spec 209.2 for Granular Backfill, Grade 1.

C Construction
Place the granular backfill at the locations designated in the plan documents. Uniformly place the granular backfill to a depth of two feet, within the proposed MSE wall limits and extend laterally to a minimum distance of exposed height of wall from wall face in each direction. Compact the granular backfill according to standard spec 207.3.6.2.

Repair any excessive rutting or deformations in the drainage blanket caused by construction operations as directed by the engineer

D Measurement
The department will measure Drainage Blanket in cubic yards of volume in its final position and condition within the limits and in places designated on the plans, in the contract, as directed by the engineer, and according to standard spec 209.4.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.1005	Drainage Blanket	CY

Payment is full compensation for furnishing and placing all materials.

76. Bedding Layer, 2” ASTM No. 8 Stone, Item SPV.0035.1006.

A Description
This special provision describes the bedding layer to be placed for the permeable concrete pavers, as shown on the plans, specified in standard spec 301 and 305, and as provided herein.

B Materials
B.1 References:
Standard spec 301, General Requirements for Base Aggregates.
Standard spec 305, Dense Graded Base.

ASTM International (American Society for Testing and Materials)

- ASTM No. 8 Stone.
- ASTM C29 – Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate.
- ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Sized Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
- ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Course Grained Aggregates.
- ASTM D448 - Standard Classification for Sizes of Aggregates for Road and Bridge Construction.
- ASTM D6928 - Standard Test Method for Resistance of Course Aggregates to Degradation by Abrasion in the Micro-Deval Apparatus.

B.2 Submittals

- Product Data: Submit gradation tests.
- Certifications: Certify material meets specified requirements.
- Samples: Provide 5-gallon container for each 500 cubic yards provided.

B3. Products

B3.1 Bedding Layer

Bedding Layer, 2" ASTM No. 8 stone shall meet the gradation below. Gradation to conform to Table 1 as tested according to ASTM C136. All aggregates shall have equal to or less than two percent passing the No. 200 sieve.

Table 1
Grading Requirements for Bedding Layer
(ASTM No. 8 Stone according to ASTM D448)

Sieve Size	Percent Passing
1/2 inch	100
3/8 inch	85 to 100
No. 4	10 to 30
No. 8	0 to 10
No. 16	0 to 5

- Comply with soundness, wear, and fracture requirements listed in the standard spec 301.2.4.5 – Aggregate Base Physical Properties.
- Provide a minimum porosity of 30 percent per ASTM C29 Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate.

C Construction

Install according to construction requirements in standard spec 301.3.

Install the Bedding Layer at the thickness, compaction rates, surface tolerances, and elevations outlined below:

- The Bedding Layer aggregate should be spread and compacted in uniform layers not exceeding two inches compacted thickness.
- Compaction shall be performed using either a 10 ton vibratory roller or a minimum 13,500 lbf centrifugal force reversible vibratory plate compactor.
- For each lift, make at least two passes in the vibratory mode and at least two passes in the static mode – continue compaction until there is no visible movement in the materials.
- Final surface tolerance of the bedding layer should be plus or minus 3/8 inch over a 10 foot straight edge laid in any direction.
- Attention shall be paid to providing proper compaction near curbs, grade beams, concrete collars around utility structures, lights standards, tree wells, building edges and other protrusions as applicable to the project. In areas not accessible to large compaction equipment, compact to specified density with mechanical tampers (jumping jacks).
- Before commencing the placing of the bedding layer, the base shall be inspected by the engineer.

Spread the bedding layer evenly over the base course and screed to a nominal 2 inch thickness. Do not use the bedding material to fill depressions in the base course surface.

Contractor shall screed the bedding layer using either an approved mechanical spreader, an asphalt paver, or by the use of screed rails and boards.

Moisten, spread and screed bedding layer. Surface tolerances shall be 3/8-inch over a 10-foot straight edge.

D Measurement
The department will measure Bedding Layer, 2” ASTM No 8 Stone 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.0035.1006	Bedding Layer, 2” ASTM No. 8 Stone	CY

Payment is full compensation for providing and placing the bedding layer for the permeable concrete pavers.

77. Base Layer, 4” ASTM No. 57 Stone, Item SPV.0035.1007.

A Description
This special provision describes the base layer to be placed for the permeable concrete pavers in the roadway, as shown on the plans, specified in standard spec 301 and 305, and as provided herein.

B Materials

B.1 References:

Standard Specifications, Section 301, General Requirements for Base Aggregates.
Standard Specifications, Section 305, Dense Graded Base.

ASTM International (American Society for Testing and Materials)

- ASTM No. 57 Stone.
- ASTM C29 – Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate.
- ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Sized Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
- ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Course Grained Aggregates.
- ASTM D448 - Standard Classification for Sizes of Aggregates for Road and Bridge Construction.
- ASTM D6928 - Standard Test Method for Resistance of Course Aggregates to Degradation by Abrasion in the Micro-Deval Apparatus.

B.2 Submittals

- Product Data: Submit gradation tests.
- Certifications: Certify material meets specified requirements.
- Samples: Provide 5-gallon sample container for each 500 cubic yards provided.

B3. Products

B3.1 Base Layer

Base Layer, 4" ASTM No. 57 stone shall meet the gradation below. Gradation to conform to Table 1 as tested according to ASTM C136. All aggregates shall have equal to or less than two percent passing the No. 200 sieve.

Table 1
Grading Requirements for Base Layer
(ASTM No. 57 Stone according to ASTM D448)

Sieve Size	Percent Passing
1-1/2 inch	100
1 inch	85 to 100
1/2 inch	25 to 60
3/8 inch	0 to 10
No. 4	0 to 5

- Comply with soundness, wear, and fracture requirements listed in the standard spec 301.2.4.5 – Aggregate Base Physical Properties.
- Provide a minimum porosity of 30 percent per ASTM C29 Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate.

C Construction
Install according to construction requirements in standard spec 301.3.

Install the Base Layer at the thickness, compaction rates, surface tolerances, and elevations outlined below:

- The aggregate should be spread and compacted in uniform layers not exceeding two inch loose thickness.
- Compaction shall be performed using either a 10 ton vibratory roller or a minimum 13,500 lbf centrifugal force reversible vibratory plate compactor.
- For each lift, make at least two passes in the vibratory mode and at least two passes in the static mode – continue compaction until there is no visible movement in the materials.
- Final surface tolerance of the base course should be plus or minus 3/8 inch over a 10 foot straight edge laid in any direction.
- Attention shall be paid to providing proper compaction near curbs, grade beams, concrete collars around utility structures, lights standards, tree wells, building edges and other protrusions as applicable to the project. In areas not accessible to large compaction equipment, compact to specified density with mechanical tampers (jumping jacks).
- Before commencing the placing of the base layer, the base shall be inspected by the engineer.

Spread the base layer evenly over the storage layer and screed to a nominal four inch thickness. Do not use the base layer material to fill depressions in the storage layer surface.

Contractor shall screed the base layer using either an approved mechanical spreader, an asphalt paver, or by the use of screed rails and boards.

Moisten, spread and screed base layer. Surface tolerances shall be 3/8-inch over a 10-foot straight edge.

D Measurement
The department will measure Base Layer, 4” ASTM No 57 Stone 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.0035.1007	Base Layer, 4” ASTM No. 57 Stone	CY

Payment is full compensation for providing and placement of the base layer for the permeable concrete pavers in the roadway

78. Storage Layer, ASTM No. 2 Stone, Item SPV.0035.1008.

A Description

This special provision describes the storage layer to be placed for the permeable concrete pavers and bio-filtration basins, as shown on the plans, specified in standard spec 301 and 305, and as provided herein.

B Materials

B.1 References:

Standard Specifications, Section 301, General Requirements for Base Aggregates.
Standard Specifications, Section 305, Dense Graded Base.

ASTM International (American Society for Testing and Materials)

- ASTM No. 2 Stone.
- ASTM C29 – Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate.
- ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Sized Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
- ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Course Grained Aggregates.
- ASTM D448 - Standard Classification for Sizes of Aggregates for Road and Bridge Construction.
- ASTM D6928 - Standard Test Method for Resistance of Course Aggregates to Degradation by Abrasion in the Micro-Deval Apparatus.

B.2 Submittals

- Product Data: Submit gradation tests.
- Certifications: Certify material meets specified requirements.
- Samples: Provide 5-gallon sample container for each 1000 cubic yards provided.

B3. Products

B3.1 Storage Layer

Storage Layer, ASTM No. 2 Stone shall meet the gradation below. Gradation to conform to Table 1 as tested according to ASTM C136. All aggregates shall have equal to or less than two percent passing the No. 200 sieve.

Table 1
Grading Requirements for Storage Layer
(ASTM No. 2 Stone according to ASTM D448)

Sieve Size	Percent Passing
3 inch	100
2-1/2 inch	90 to 100
2 inch	35 to 70
1-1/2 inch	0 to 15
3/ 4 inch	0 to 5

- Comply with soundness, wear, and fracture requirements listed in the Standard Specifications Section 301.2.4.5 – Aggregate Base Physical Properties.
- Provide a minimum porosity of 30 percent per ASTM C29 Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate.

C Construction

Install according to construction requirements in standard spec 301.3.

Install 30 mil PVC liner, with 8 oz. non-woven protective geotextile fabric according to the manufacturer's recommendations. The liner is applied to the bottom and sides of the excavation. Allow for enough liner to exceed the final elevation of the surface. After completion of the surface, the excess liner should be cut flush with the finished grade.

Install liner and geotextile as required according to the Drawings. The liner and geotextile are applied to the bottom and sides of the excavation with overlapping joints a minimum of 12 inches. Overlaps to follow down slope. Allow for enough liner and geotextile to exceed the final elevation of the surface. After completion of the surface, the excess liner and geotextile should be cut flush with the finished grade.

Install the Storage Layer at the thickness, compaction rates, surface tolerances, and elevations outlined below:

- Place and spread the first layer of sub-base without displacing or damaging the liner and geotextile. To prevent damage, tracked vehicles must not be used to spread the initial Storage layer.
- The aggregate should be spread and compacted in uniform layers not exceeding 6 inch loose thickness.
- Compaction shall be performed using either a 10 ton vibratory roller or a minimum 13,500 lbf centrifugal force reversible vibratory plate compactor.
- For each lift, make at least two passes in the vibratory mode and at least two passes in the static mode – continue compaction until there is no visible movement in the materials.
- Install the 6-inch diameter PVC underdrain according to the manufacturer's recommendations at the elevations and slopes shown on the plans.
- Ensure the underdrains are properly sloped to provide proper drainage to the outlets control structures. Care must be taken not to damage underdrains during subsequent aggregate and engineered soil installation.
- Final surface tolerance of the storage layer should be plus or minus one inch over a 10 foot straight edge laid in any direction.
- Attention shall be paid to providing proper compaction near curbs, grade beams, concrete collars around utility structures, lights standards, tree wells, building edges and other protrusions as applicable to the project. In areas not accessible to large compaction equipment, compact to specified density with mechanical tampers (jumping jacks).

- Before commencing the placing of the storage layer, the base shall be inspected by the engineer.

D Measurement

The department will measure Storage Layer ASTM No. 2 Stone 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.0035.1008	Storage Layer, ASTM No. 2 Stone	CY

Payment is full compensation for the providing and placement of the storage layer for the permeable concrete pavers and bio-filtration basins. Payment for the storage layer shall include payment for placement of 30 mil PVC liner with 8 oz. non-woven protective geotextile fabric, and placement and compaction of ASTM No. 2 Stone; and preparation of the sub-soil base. Underdrain placed beneath or above the storage layer will be paid for separately as Underdrain. Bedding for underdrain within or on top of the storage layer will be paid for as part of the storage layer. Excavation for the storage layer and other components of the permeable pavement system and bio-filtration basins will be paid for as common excavation.

79. Engineered Soil for Bio-Filtration Basins, Item SPV.0035.1009.

A Description

This special provision describes furnishing and installing Engineered Soil for Bio-Filtration Basins, as shown on the plans, pertinent provisions of standard spec 501, 505, 606, 612, and 630 and as provided.

B Materials

B.1 References:

ASTM International (American Society for Testing and Materials)

- ASTM C33 – Specification for Concrete Aggregates.
- ASTM D2434 – Standard Test Method for Permeability of Granular Soils (Constant Head).

Wisconsin Department of Natural Resources: (WDNR)

- Conservation Practice Standard (1002) – Site Evaluation for Stormwater Infiltration.
- Conservation Practice Standard (1004) – Bio-retention for Infiltration.
- Wisconsin Department of Natural Resources, Specification S100, Compost.
- Chapter NR 151 – Runoff Management.

B.2 Submittals

- Shop Drawings: Indicate dimensions of engineered soil areas, piping, pipe inverts, and gradient of slope between corners and intersections.
- Product Data: Submit data on engineered soil, including composition, gradation, and source.
- Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
- Provide sample of engineered soil. Provide one 5-gallon container for each 500 cubic feet of material supplied.

B.3 Closeout Submittals

Record location of pipe runs, connections, cleanouts, and principal invert elevations.

B4. Products

B.4.1 Engineered Soil

Engineered Soil Composition: The engineered soil shall conform to the following specifications:

- Engineered soil shall consist of a mixture of 70 percent to 85 percent sand and 15 percent to 30 percent compost, by volume.

B.4.1.1 Sand

The sand shall meet gradations identified in standard spec 501.2.5.3.4 Fine Aggregates, Size Requirements, or ASTM C33 Fine Aggregates, Concrete Sand.

The preferred sand component consists of mostly SiO_2, but sand consisting of dolomite or calcium carbonate may also be used. Manufactured sand or stone dust is not allowed.

The sand shall be washed and drained to remove clay and silt particles prior to mixing.

B.4.1.2 Compost

Compost material shall meet Wisconsin DNR Specification S100, and the following requirements:

- Particle Size – 98 percent of the compost shall pass through a 0.75-inch screen.
- Physical Contaminants – less than 1 percent combined glass, metal and plastic.
- Organic Matter/Ash Content – At least 40 percent organic matter and less than 60 percent ash content.
- Carbon to Nitrogen Ratio – 10-20:1 C:N ratio.
- pH – Between 6 and 8.
- Soluble Salts – Electrical conductivity below 10dS m-1 (mmhos cm-1).
- Moisture Content – Between 35 percent and 50 percent by weight.
- Maturity – The compost shall be aged and resistant to further decomposition and free of compounds, such as ammonia and organic acids, in concentrations toxic to plant growth.
- Residual Seeds and Pathogens – Pathogens and noxious seeds shall be minimized.

The engineered soil mix shall be free of rocks, stumps, roots, brush or other material over 1 inch in diameter. No other materials shall be mixed with the engineered soil that may be harmful to plant growth or prove a hindrance to planting or maintenance.

The engineered soil mix shall have adequate nutrient content to meet plant growth requirements.

C Construction

C.1 Examination

Verify trench cut and excavated base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

The drainage area shall not contain significant sources of soil erosion that could impact the engineered soil.

C.2 Preparation

Provide a person trained and experienced in the construction, operation, and maintenance of bio-filtration areas and who shall be responsible for construction of the bio-filtration area.

The contractor shall not allow construction site runoff from disturbed areas to enter the bio-filtration area during construction.

Runoff from pervious areas shall be diverted from the basin area until the pervious areas have undergone final stabilization.

Suspend construction during periods of rainfall or snowmelt. Construction shall remain suspended if ponded water is present or if residual soil moisture contributes significantly to the potential for soil smearing, clumping or other forms of compaction.

Minimize compaction and smearing of the soils beneath the floor and side slopes of the bio-filtration area, and over-compaction of the engineered soils.

During construction, cordon off the area dedicated to the bio-filtration area to prevent access by heavy equipment.

Acceptable equipment for constructing the bio-filtration area includes excavation hoes, light equipment with turf type tires, marsh equipment or wide-track loaders.

If compaction occurs at the base of the bio-filtration area, re-fracture the soil shall to a depth of at least 12 inches.

If soil smearing occurs, correct the smeared areas of the interface by raking or roto-tilling.

C.3 Subdrainage Installation
Install underdrain in conformance with requirements of ASTM D2321 and conforming to the requirements specified in standard spec 612.

Lay pipe to slope gradients noted on Drawings; with maximum variation from indicated slope of 1/8-inch in 10 feet.

Place underdrain with perforations facing down. Join pipe with integral bell gasketed joint.

Provide and install pipe couplings as required for specific fitting applications.

Install stone around underdrain cover and wrap with fabric, as shown on plans.

C.4 Installation
C.4.1 Placement and Settling Of Engineered Soil
Prior to placement in the bio-filtration area, pre-mix the engineered soil shall and ensure the moisture content is low enough to prevent clumping and compaction during placement.

Place the engineered soil in multiple lifts, each approximately 12 inches in depth.

Steps may be taken to induce mild settling of the engineered soil bed as needed to prepare a stable planting medium and to stabilize the ponding depth. The contractor shall not use vibrating plate-style compactors to induce settling.

C.5 Field Quality Control
Completed bio-filtration basin shall have no standing water 24 hours after cessation of precipitation. Failure to meet this criterion shall be cause for remediation, as directed by the engineer.

C.6 Permeability Testing
Perform a permeability test on each completed bio-filtration basin.

C.7 Protection of Installed Construction
Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

D Measurement
The department will measure Engineered Soil for Bio-Filtration Basins 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.0035.1009	Engineered Soil for Bio-Filtration Basins	CY

Payment is full compensation for furnishing and placing the engineered soil; installing all materials; cleaning up any material left over. Underdrain placed beneath the engineered soil will be paid for separately as Underdrain. Bedding for underdrain within the engineered soil or on top of the storage layer will be paid for as part of the storage layer. Excavation for the storage layer and other components of the bio-filtration basins will be paid for as common excavation.

80. Lightweight Foamed Concrete Fill Grade 1, Item SPV.0035.1010.

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 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 according to the contract documents.

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, and/or improving the bond) 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	Test Method
Cast Density (after pumping)	36.0 - 40.0 pcf	ASTM C 796
Maximum Dry Density	34.0 pcf	ASTM C 796
Minimum Dry Density	30.0 pcf	ASTM C 796
Unconfined Compressive Strength	20 psi minimum at 24 hours curing 70 psi minimum at 28 days curing	ASTM C 796
Frost Heave	< 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	N/A	ASTM C 666* as modified below
Coefficient of permeability	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 according 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 bid item.
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 C.2, 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 ten 3-inch diameter by 6-inch high cylinder samples of each grade of LFCF as designed and tested 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 according 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 1/2 of 1 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

Conduct acceptance testing and provide 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 according 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 according to ASTM C 796 except do not oven dry the test specimens. 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 according to ASTM C1064.

1. 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 Technical Services, Truax Center, 3502 Kinsman Blvd., Madison Wisconsin 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 according to standard spec 206.3.8. Remove standing water in the test areas prior to placement of the LFCF.

Dewatering of the excavation must be maintained as necessary to ensure foamed concrete does not become buoyant. Surface water must be prevented from flowing into the excavation. To reduce the need for dewatering the contractor may, at no additional expense to the project, utilize a higher density of foamed concrete (up to 80 pounds per cubic foot) for the first lift.

Subgrade for LFCF fill will be prepared according 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 according 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 (1/2-inch) using a hand rake or other suitable means. Scarify after sufficient curing time such that foot traffic will not excessively damage the lift surface (no greater than 6 mm (1/4-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 to the department.

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 2-foot lift. Stagger placements such that the vertical joints are at least 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.

The final surface finish of LFCF shall be within $\pm$ 0.1 foot of the elevations shown on the plans.

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 Acceptance
Rectify any LFCF material rejected by the engineer that does not meet the minimum required material properties or is not installed according 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 according to this article.

D Measurement
The department will measure Lightweight Foamed Concrete Fill Grade 1 by the cubic yard of LFCF material acceptably completed, placed within the limits shown on the plans according 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. LFCF placed as backfill within the EPS wall system will be measured and paid for as Lightweight Foamed Concrete Fill Grade 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.0035.1010	Lightweight Foamed Concrete Fill Grade 1	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.

81. Coloring Concrete Dark Gray, Item SPV.0035.1011; Light Gray, Item SPV.0035.1012.

A Description
This special provision describes coloring concrete used to construct work under other contract bid items as well as any special materials and construction techniques associated with using coloring concrete.

B Materials
Conform to standard spec 405, except replace standard spec 405.2.1(1) with the following:

For Dark Gray: Match the colored concrete in reasonably close conformance to Belgard AquaLine L-stone Permeable Paver, Graphite color; (resembling Federal Standard 595B Color Server, FS color 36081).

For Light Gray: Match the colored concrete in reasonably close conformance to Belgard AquaLine L-stone Permeable Paver, Foundry color, (resembling Federal Standard 595B Color Server, FS color 36314).

Use Belgard AquaLine L-stone Permeable Paver samples of the colored specified as a comparison in establishing the final mix designs.

C Construction
Conform to standard spec 405.

D Measurement
The department will measure Coloring Concrete Dark Gray and Coloring Concrete Light Gray by the cubic yard, 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.0035.1011	Coloring Concrete Dark Gray	CY
SPV.0035.1012	Coloring Concrete Light Gray	CY

Payment is full compensation for providing colored concrete in conformance with standard spec 405.5.

82. Concrete Masonry Overlay Decks Unit B-40-400-1D, Item SPV.0035.2001.

A Description
This special provision describes construction of a concrete overlay according to standard spec 501, 502, 505 and 509, as shown on the plans, and as hereinafter provided. The concrete mix used for the concrete overlay on unit B-40-400-1D shall include polypropylene fibers.

B Materials
The polypropylene fibers shall be engineered synthetic reinforcing fibers of 100% polypropylene collated fibers.

The physical properties of the fibers shall be as follows:

Specific Gravity:	0.91
Denier:	Less than 100
Modulus of Elasticity:	0.5×10^6 to 0.7×10^6 psi
Tensile Strength:	70 to 110 ksi
Length:	1/2 to 2-1/2 inches

The polypropylene fiber manufacturer shall certify in writing that all polypropylene fibers are specifically manufactured for use in concrete from virgin polypropylene and the physical properties are within the limits specified above.

If the fiber manufacturer is other than the brand name listed on the literature and/or packaging, the certification must be from the original manufacturer of the polypropylene fibers.

The fiber length shall be determined by the manufacturer to be compatible with the concrete mix design.

C Construction

The polypropylene fiber manufacturer or authorized distributor shall provide the services of a qualified engineer or employee for a pre-construction meeting and initial job start up.

Use polypropylene fibers at the rate 3.0 to 3.2 pounds per cubic yard of concrete. The fibers may be added with the fine and coarse aggregates or in the mixer after all ingredients have been blended and mixed according to manufacturer's recommendations.

D Measurement

The department will measure Concrete Masonry Overlay Decks Unit B-40-400-1D 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.0035.2001	Concrete Masonry Overlay Decks Unit B-40-400-1D	CY

Payment is full compensation for providing Concrete Masonry Overlay Deck with fibers.

83. Expanded Polystyrene (EPS) Geofoam, Item SPV.0035.2002.

A Description

This special provision describes supplying and constructing block-molded expanded polystyrene (EPS) for use as a geofoam geosynthetic product (EPS- geofoam) as a lightweight fill material behind precast concrete wall panels on Retaining Wall Structure R-40-629.

B Materials

B.1 EPS Geofoam Blocks

B.1.1 Composition

All EPS-block geofoam shall consist entirely of expanded polystyrene. At the discretion of the molder, the EPS-geofoam may consist of some mixture of virgin raw material and recycled EPS material. Only post industrial recycled material (regrind) is permitted and shall not exceed 10% of the total raw material used.

B.1.2 Physical Properties

EPS geofoam shall conform to the requirements of ASTM D6817 for the type listed below:

B.1.3 Type EPS29

Physical Properties when tested according to ASTM D 6817 shall be:

a. Density shall be a minimum of 1.80 lb/ft^3, when tested according to ASTM D 1622.
b. Compressive Resistance at 1 percent deformation shall be a minimum of 10.9 psi when tested according to ASTM D 1621.
c. Flexural Strength shall be a minimum of 50.0 psi when tested according to ASTM C 203.
d. Elastic Modulus shall be a minimum of 1090 psi when tested according to ASTM C 203.
e. Oxygen Index shall have a minimum volume of 24.0 percent when tested according to ASTM C 2863.

B.1.4 Type EPS39

Physical Properties when tested according to ASTM D 6817 shall be:

a. Density shall be a minimum of 2.40 lb/ft^3, when tested according to ASTM D 1622.
b. Compressive Resistance at 1 percent deformation shall be a minimum of 15.0 psi when tested according to ASTM D 1621.
c. Flexural Strength shall be a minimum of 60.0 psi when tested according to ASTM C 203.
d. Elastic Modulus shall be a minimum of 1500 psi when tested according to ASTM C 203.
e. Oxygen Index shall have a minimum volume of 24.0 percent when tested according to ASTM C 2863.

B.1.5 Type EPS XPS 48

Physical Properties when tested according to ASTM D 6817 shall be:

a. Density shall be a minimum of 3.0 lb/ft^3, when tested according to ASTM D 1622.
b. Compressive Resistance at 1 percent deformation shall be a minimum of 40.6 psi when tested according to ASTM D 1621.
c. Flexural Strength shall be a minimum of 100.0 psi when tested according to ASTM C 203.
d. Elastic Modulus shall be a minimum of 4060 psi when tested according to ASTM C 203.
e. Oxygen Index shall have a minimum volume of 24.0 percent when tested according to ASTM C 2863.

B.1.6 Dimensional Tolerances

The thickness, width, and length dimensions of an EPS block are defined herein as the minimum, intermediate, and maximum overall dimensions of the block, respectively, as measured along a block face. These dimensions of each block shall not deviate from the theoretical dimensions by more than 0.5 percent.

The corner or edge formed by any two faces of an EPS block shall be perpendicular, i.e., form an angle of 90 degrees. The deviation of any face of the block from a theoretical

perpendicular plane shall not exceed 0.12 inch over a distance of 20 inches. Any one face of a block shall not deviate from planarity by more than 0.2 inch when measured using a straightedge with a length of 10 feet.

B.1.7 Seasoning

All EPS-block geofoam shall be adequately seasoned prior to shipment to the project site. For the purposes of this Special Provision, seasoning is defined as storage in an area suitable for the intended purpose as subsequently defined herein for a minimum of 72 hours at normal ambient room temperature after an EPS block is released from the mold. Seasoning shall be done within a building or other structure that protects the EPS blocks from moisture as well as ultraviolet (UV) radiation. The area in which EPS blocks are stored for seasoning shall also be such that adequate space is allowed between blocks and such that positive air circulation and venting of the structure are provided so as to foster the outgassing of blowing agent and trapped condensate from within the blocks. The owner's agent shall be allowed to inspect the structure(s) to be used for seasoning upon request and during normal business days and hours. The molder or primary molder may request a shortened seasoning period if the EPS blocks are seasoned within an appropriate heated storage space and the molder or primary molder demonstrates to the satisfaction of the owner's agent that the alternative seasoning treatment produces blocks that equal or exceed the quality of blocks subjected to the normal 72-hour seasoning period.

B.1.8 Marking

Each block shall be clearly marked with the following information:

a. Manufacturer if more than one manufacturer is supplying material for the job.
b. Lot number of the production run that produced the block.
c. Date the block was produced.
d. Piece number if special sized blocks are produced. The piece number shall be coordinated to the block layout plan described in section C.2.3.1.

B.1.9 Storage and Handling

At all stages of manufacturing, shipment, and construction, the EPS blocks shall be handled in a manner so as to minimize physical damage to the blocks. No method of lifting or transporting the blocks that creates dents or holes in the block surfaces or losses of portions of the block shall be allowed.

If the EPS blocks are to be stockpiled at the project site until placement, a secure storage area shall be designated for this purpose. The storage area shall be away from any heat source or construction activity that produces heat or flame. In addition, personal tobacco smoking shall not be allowed in the storage area. EPS blocks in temporary on-site storage shall be secured with sandbags and similar "soft" weights to prevent their being dislodged by wind. The blocks shall not be covered in any manner that might allow the buildup of heat beneath the cover. The blocks shall not be trafficked by any vehicle or equipment. In addition, foot traffic by persons shall be kept to a minimum.

Geo-Synthetic Fill that is anticipated to be exposed to sunlight for more than six months shall be covered with an opaque material to prevent ultraviolet light degradation. Remove material that is exposed for excessive period beyond six months.

Protect the Geo-Synthetic Fill from: organic solvents such as acetone, benzene, and paint thinner; petroleum based solvents such as gasoline and diesel fuel; and open flames.

B.1.10 Certification
The manufacturer or supplier shall furnish third party certification that the material meets the requirements of this specification and ASTM D6817.

Testing of physical properties specified above shall be performed on samples of material delivered to the site at a frequency of 1 test for every 1000 CY of material delivered with the first test being performed on the first 100 CY of material placed. At least one test must be performed for each lot of material delivered to the site. Submit copies of the test reports to the engineer on the day the material is delivered. The results shall indicate the lot number(s) of the material tested and must match the material delivered.

B.1.11 Field Verification
A minimum of 1% of the blocks shall be checked for dimensional tolerances and apparent density in the field immediately prior to being incorporated into the work.

The contractor will provide and maintain a suitable scale to weigh the blocks onsite at all times during which blocks are being placed. Submit a current calibration for the scale.

Measure the dimensions and record the weight in the presence of the State's inspector. Make all measurements and compute apparent density according to ASTM D1622.

B.1.12 Mechanical Connectors
Connectors shall be galvanized steel multi-barbed connectors as recommended by the manufacturer. Each connector shall have a lateral holding strength of at least 60 lbs when tested with an EPS15 Geofoam.

B.1.13 Termite Treatment
All EPS-block geofoam shall be treated by the manufacturer with a tested and proven termite treatment for layered and below grade applications and minimum 3-year field exposure. The termite treatment agent shall be an EPA registered material. The contractor shall submit certification for the termite application material.

B.2 Gasoline Resistant Geomembrane (GRG)
GRG must be a reinforced or unreinforced tri-polymer or EVOH barrier membrane manufactured from LLDPE with an EVOH barrier layer, polyvinyl chloride (PVC), ethylene interpolymer alloy and polyurethane, or a comparable polymer combination. GRG must confine spilled liquid hydrocarbons, including gasoline, diesel fuel, kerosene, hydraulic fluid, methanol, ethanol, mineral spirits, and naptha in both the liquid and vapor phases. GRG must cover and closely conform to 90-degree edges and corners of EPS blocks at ambient temperatures down to 45°F, without applying heat.

GRG must comply with the following:

Physical Property	ASTM Designation	Acceptance Value[1]
Unleaded Gasoline Permeability	D 814	0.0 oz./ft^2 Maximum per 24 hours
Thickness	D 5199[2]	30 mils Minimum
Grab Tensile Strength (1" grip, 4" x 8" sample)	D 751[2]	310 lbf Minimum in each direction
Elongation at break	D 751[2]	504 percent Minimum
Puncture Resistance (ball tip)	D 4833[2]	<190 lbf Minimum
Cold Crack Resistance (1" mandrel, 4 hours)	D 2138[2]	Pass at -30°F
Factory Produced Seams, Bonded Width	D 751[3]	2" Minimum
Factory Produced Seams, Shear Strength	D 751[3]	59 lbf Minimum
Field Produced Seams, Vapor Tight Seal	D 5641	Pass
[1]Specified as Minimum or Maximum, not average roll properties. [2]Or ASTM test method appropriate for specific polymer. [3]Modified per NSF Standard No. 54.		

C Construction

C.1 Design Requirements

Construct the embankment according to the lines, grades, heights and dimensions shown on the plans, as herein specified, and as directed by the department.

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. See Section C2.1 for design calculations and requirements.

C.2 Submittals

Before starting construction or delivering material to the site, submit information and drawings that show the proposed block layout and construction details as listed below. Submitted items shall be approved by the engineer prior to placement of blocks.

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 hard copies and electronic 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.

- Complete Design Calculations for alternative design (if allowed by the department)
- Product Data
- Shop Drawings, including Block Layout, Construction Sequence, Installation Instructions and Facing Connection details
- Verification Samples
- Manufacturer's Certificates
- Quality Assurance (Manufacturer's Qualifications)

C.2.1 Design Calculations (Optional)
At the option of the contractor and if allowed by the department, the EPS embankment may be designed with alternative EPS material. The alternative design shall be subject to review and approval by the department, before starting construction or delivering material to the site. Design and construct the embankment according to the lines, grades, heights and dimensions shown on the plans, as herein specified, and as directed by the department.

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. Design calculations shall conform to the requirements of this special provision and especially section C.2.1.1 Design Requirements, and the design requirements, loading and geometry as shown on the plans. Design calculations shall include explanatory notes and supporting materials. 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.

All plans, shop drawings, and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin experienced in the design of EPS material for transportation projects.

C.2.1.1 – Design Requirements:
Design EPS fill to evaluate the stability of the entire EPS mass under all conditions (including wind and truck loading) during construction as well as it long-term performance in the permanent configuration.

The design shall be in compliance with the following:
- AASHTO LRFD Bridge Design Specifications 6th Edition 2012, (AASHTO LRFD) with latest interim specifications.
- National Cooperative Highway Research Program (NCHRP) Report 529, Guideline and Recommended Standard for Geofoam Applications in Highway Embankments, Transportation Research Board, 2004.
- ASTM D6817 / D6817M-15, Standard Specification for Rigid Cellular Polystyrene Geofoam, ASTM International, West Conshohocken, PA, 2015, www.astm.org.
- Design Loads shall be less than minimum elastic limit of EPS block, based on the compressive resistance at 1% strain per ASTM D6817, and a Factor of Safety for Vertical Stress of 1.2 per NCHRP Report 529.

- WisDOT's current Standard Specifications for Highway and Structure Construction (Standard Specifications).
- WisDOT's LRFD Bridge Manual.
- Design loads and requirements specified on the plans.
- Project Geotechnical Reports.
- Standard engineering design procedures as determined by the department.

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.

C.2.2 Product Data

Manufacturer's data sheets on each product to be used, including:

a. Preparation instructions and recommendations.
b. Storage and handling requirements and recommendations.
c. Installation methods.

C.2.3 Shop Drawings

Submit Shop Drawings showing the following:

a. Profile and section view of the proposed embankment.
b. Block Layout
c. Construction Sequence
d. Installation Instructions
e. Facing Connection Details
f. Location and type of connectors.
g. Ballasting or guying techniques.
h. Placement sequence and methods.

C.2.3.1 Block layout

The block layout shall indicate the size, type, location and orientation of all Geofoam blocks. The block layout shall conform to the following requirements:

a. There must be a minimum of two layers of blocks at all locations.
b. Within a given layer of blocks, the longitudinal axes of all blocks must be parallel to each other.
c. Within a given layer of blocks, the vertical joints between the adjacent ends of blocks within a given row of blocks must be offset to the greatest extent practicable relative to blocks in adjacent rows.
d. The longitudinal axes of blocks for layers above and/or below a given layer must be perpendicular to the longitudinal axes of blocks within that given layer.
e. The longitudinal axes of the uppermost layer of blocks must be perpendicular to the longitudinal axis of the road alignment.

C.2.3.2 Construction sequence: Submit a detailed construction sequence for the blocks indicating any other construction items that must be accomplished before, during and after placement of the EPS geofoam blocks.

C.2.3.3 Installation instructions: Submit an installation plan that includes handling instructions, spike plate installation instructions, facing connector installation instructions, temporary ballasting or support requirements, and any other installation details recommended by the manufacturer.

C.2.3.4 Facing connection details: Submit plans showing the proposed method of connecting the precast concrete wall panel to the EPS slab.

Connections must be capable of supporting the panels in a vertical position after any temporary panel bracing is removed.

Connections must be designed to accommodate anticipated compression of the EPS geofoam blocks due to the weight of the load distribution slab and pavement section.

C.2.4 Manufacturer's Certificates:
Submit Manufacturer Certificates which certify proposed products meet or exceed the following:

a. Manufacturer's test reports showing the physical properties and standards for the products specified as tested according to ASTM D 7557.
b. Manufacturer's Certificate of Compliance for the first 100 CY and for every 1500 CY thereafter of Geofoam before product is delivered to the site.
c. Computer generated stress-strain data and the accompanying curves from compressive testing. Curves and/or data shall clearly indicate the stress at 1 percent strain and the modulus of elasticity.
d. Each delivery shall have the compression test data for each lot attached with the delivery paperwork.
e. Certificate of Compliance shall include current inspection reports showing that the Geofoam manufacturer is in compliance with a UL follow-up service program for both flame and physical properties.

C.2.5 Quality Assurance
Manufacturer Qualifications: Manufacturer with a minimum of 5 years documented experience in the manufacture of lightweight, geo-synthetic fill. Manufacturer must also have a UL classification in category BRYX. Manufacturer must also maintain a UL classification in category QORW that ensures physical properties according to ASTM D 6817. Third-party certifications that only include ASTM C 578 physical properties will not be considered as an alternative equal and will be rejected.

C.2.6 Subgrade Preparation
Place the granular base or drainage layer to the lines and grade as shown on the drawings. The subgrade surface on which the EPS blocks will be placed shall be sufficiently planar (i.e., smooth) prior to the placement of the first block layer. The required smoothness is defined as a vertical deviation of no more than 0.5 in. over any 10 ft. distance.

There shall be no debris of any kind on the subgrade surface when EPS blocks are placed. The subgrade shall not be frozen and there shall be no standing water or accumulated snow or ice on the subgrade within the area where EPS blocks are placed at the time of block placement.

C.2.7 Placement of EPS Geofoam Blocks

Install according to manufacturer's instructions and to the lines, grades and locations shown on the approved block layout plan.

The surface of a layer of EPS-Geofoam blocks to receive additional blocks shall be constructed with a variation in surface tolerance of no more than 0.5 inches in any 10 foot interval.

Blocks shall not be placed above blocks in which ice has developed on the surface.

All blocks shall accurately fit relative to adjacent blocks. No gaps greater than 0.75 inches will be allowed on vertical joints.

Finished surfaces of the Geo-Synthetic Fill immediately beneath pavement sections or load distribution slabs shall be constructed to within the tolerance of zero to minus 2 inches of the indicated grade.

Place blocks so that they comply with the layout requirements in C.2.3.1.

Blocks may be field cut using a hot wire. Methods of cutting that produce individual beads or dust such as saws or other abrasive cutters will NOT be permitted.

Install mechanical spike plate connectors per the manufacturer’s instructions as each block is placed.

Install facing connectors per the approved connection details and installation instructions.

Reinforcement for the load distribution slab and moment slabs may be supported on top of the EPS geofoam using approved re-bar supports or chairs. Wire chairs shall be equipped with bearing plates to prevent punching of the chair into the EPS geofoam during concrete placement.

The manufacturer of the EPS blocks shall provide a qualified installation technician to be on the site during the installation of the initial layers of blocks to advise the contractor of the procedures to be followed. The contractor, along with the EPS manufacturer shall work closely with the installation technician to assure that a satisfactory end product is being achieved.

C.2.8 Gasoline Resistant Geomembrane (GRG)
The GRG shall be fabricated to size for each area of the EPS geofoam application. The GRG shall be free of wrinkles and as tight to the surface as possible. The GRG shall be properly welded by a certified installer in order to seal the EPS structure within the GRG. Lapping of GRG is only allowed at locations shown on the plan or as approved by the engineer.

C.2.9 Protection
The surfaces of the EPS blocks shall not be directly traversed by any vehicle or construction equipment during or after placement of the blocks.

Because of the light unit-weight of the geofoam fill, provide temporary weighting and/or guying as necessary until all the blocks are built into a homogeneous mass, and the pavement section as well as any soil cover are in place.

Protect blocks in place from heat; flame; organic solvents such as acetone, benzene, and paint thinner; and petroleum based solvents such as gasoline and diesel fuel.

Repair or replace any block damaged prior to placement of the load distribution slab.

D Measurement
The department will measure Expanded Polystyrene (EPS) Geofoam 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.0035.2002	Expanded Polystyrene (EPS) Geofoam	CY

Payment is full compensation for furnishing, fabricating, transporting, storing and placing EPS geofoam blocks, spike connectors, facing connectors and flexible membrane liners as shown on the drawings.

84. HPC Masonry Structures, Item SPV.0035.2003.

This special provision describes specialized material and construction requirements for high-performance concrete used in bridge structures. Conform to standard spec 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 standard spec 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 air 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) 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 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.

502.2.6.2 Burlap
Replace the entire text with the following:

(1) Furnish burlap conforming to AASHTO M 182, class 1, 2, 3 or 4.

502.3.2.1 Detailed Plans
Replace the entire text with the following:

(1) As specified in 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) The contractor shall 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. The rails or tracks shall be supported outside the limits of the finished riding surface. Rails or tracks are not allowed to be supported 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) Hand finishing, except for the edge of deck, must be kept to a minimum. The finishing machine must be equipped 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 wetted burlap or wetted 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 wetted 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. The fogging system must remain set up and in operating condition 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 wetted 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 conforming to standard spec 109.1.1.2 at the contract unit price and incidentals necessary to complete the work under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.2003	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) Permeability samples for AASHTO T 277 testing must be stripped of their molds and wet cured 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.

85. Trench Drain, Item SPV.0060.1001.

A Description
This special provision describes furnishing and installing trench drain frame and grates, grout bedding, pipe fittings, compressible filled, and PVC piping; according to the pertinent provisions of standard spec 607 and standard spec 611 and as hereinafter provided.

B Materials
Furnish trench drain frame and grates materials as identified in Drainage Details. Trench Drain shall be Neenah R-4995-A Type M Frame with Type C grate or approved equal.

Furnish all PVC piping and fitting materials conforming to the requirements specified in standard spec 607.2.

Furnish grout material conforming to the requirements specified in the special provision "Backfill Controlled Low Strength".

Furnish compressible filler material conforming to the requirements specified in standard spec 502.2.7.

C Construction
Install trench drain as shown in the drainage plans and details at locations shown in the drainage plans and details and according to standard spec 607.3 and standard spec 611.3.3.

D Measurement
The department will measure Trench Drain on a unit basis for each trench drain 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.0060.1001	Trench Drain	Each

Payment is full compensation for providing all materials, including frame and grates, grout material bedding, compressible filler, storm sewer, all fittings, for furnishing all excavating, granular backfill, disposing of surplus material, and for cleaning out structures and pipes upon completion.

86. Permeable Pavement Outlet Control Structure, Item SPV.0060.1002.

A Description
This special provision describes furnishing and installing Permeable Pavement Outlet Control Structure, including aluminum plates with handles and orifices, and aluminum extruded grooves at the depths and locations shown on the plans according to the pertinent provisions of standard spec 611 and as hereinafter provided.

B Materials
Furnish materials conforming to the requirements specified in standard spec 611.2.

Furnish aluminum plate with handles and orifices and aluminum plate guide assembly identified in the plan.

C Construction
Construct outlet control structure as shown in the plans and according to standard spec 611.3. Install aluminum plate and guided groove as detailed in the plans.

D Measurement
The department will measure Permeable Pavement Outlet Control Structure on a unit basis for each outlet control 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.0060.1002	Permeable Pavement Outlet Control Structure	Each

Payment is full compensation for providing all materials, including all masonry, conduit, underdrain and sewer connections, aluminum plates with orifices and handles, aluminum plate guided groove, and other fittings; for furnsihing all excavating, granular backfill, disposing of surplus material, and for cleaning out structure upon completion.

87. Bio-Filtration Outlet Control Structure, Item SPV.0060.1003.

A Description
This special provision describes furnishing and installing Bio-Filtration Outlet Control Structure, including aluminum plates with handles and orifices, frame and grate, and aluminum extruded grooves at the depths and locations shown on the plans according to the pertinent provisions of standard spec 611 and as hereinafter provided.

B Materials
Furnish materials conforming to the requirements specified in standard spec 611.2.

Furnish frame and grate as identified in the plan.

Furnish aluminum plate with handles and orifices and aluminum plate guide assembly identified in the plan.

C Construction
Construct outlet control structure as shown in the plans and according to standard spec 611.3. Install aluminum plate and guided groove as detailed in the plans.

D Measurement
The department will measure Bio-Filtration Outlet Control Structure on a unit basis for each outlet control 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.0060.1003	Bio-Filtration Outlet Control Structure	Each

Payment is full compensation for providing all materials, including all masonry, conduit, underdrain and sewer connections, aluminum plates with orifices and handles, frame and grate, aluminum plate guided groove and other fittings; for furnsihing all excavating, granular backfill, disposing of surplus material, and for cleaning out upon structure upon completion.

88. Manhole 9-FT Diameter, Item SPV.0060.1004; 10-FT Diameter, Item SPV.0060.1005.

A Description
Furnish and install 9-FT and 10-FT interior diameter manhole structures at the depths and locations shown on the plans according to the pertinent provisions of standard spec 611 and as hereinafter provided.

B Materials
Furnish materials conforming to the requirements specified in standard spec 611.2.

C Construction
Place manholes as shown in the plans and as specified in standard spec 611.3. Construct according to Manholes Type 3 as indicated in the standard detail drawing "Manholes 3-FT, 4-FT, 5-FT, 6-FT, 7-FT AND 8-FT Diameter" except with a 9-FT or 10-FT interior diameter. Minimum wall thickness for 9-FT and 10-FT Diameter manholes shall be 10 inches.

D Measurement
The department will measure Manhole 9-FT Diameter and Manhole 10-FT Diameter separately as each 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.0060.1004	Manhole 9-Foot Diameter	Each
SPV.0060.1005	Manhole 10-Foot Diameter	Each

Payment will be as specified in standard spec 611.5.2.

89. Enhanced Catch Basin, Type 44A Structure, Item SPV.0060.1006; Enhanced Catch Basin, Type 44A Modified Structure, Item SPV.0060.1044.

A Description
This special provision describes furnishing and installing Enhanced Catch Basins Type 44A Structure, including baffles, and trap at the depths and locations shown on the plans according to the pertinent provisions of standard spec 611 and as hereinafter provided.

B Materials
Furnish materials conforming to the requirements specified in standard spec 611.2.

Furnish SAFL Baffles and required hardware in Enhanced Catch Basins Type 44A Structure and Enhanced Catch Basins Type 44A Modified Structure as manufactured by Upstream Technologies Inc. or approved equal.

Furnish trap Assembly as identified in the plan.

C Construction
Construct catch basins as shown in the plans and according to standard spec 611.3. Install SAFL Baffle per manufacturer's specifications and as detailed in the plans.

Furnish and install SAFL Baffles and required hardware per the manufacturer's specifications and as detailed in the plans.

D Measurement
The department will measure Enhanced Catch Basin, Type 44A Structure and Enhanced Catch Basin, Type 44A Modified Structure on a unit basis for each catch basin, 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.0060.1006	Enhanced Catch Basin, Type 44A Structure	Each
SPV.0060.1044	Enhanced Catch Basin, Type 44A Modified Structure	Each

Payment is full compensation for providing all materials, including all masonry, conduit and sewer connections, trap connections, steps and other fittings; SAFL Baffle and hardware; for furnsihing all excavating, granular backfill, disposing of surplus material, and for cleaning out 4-foot sump upon structure completion.

90. Enhanced Catch Basin, Trapped Storm Structure, Item SPV.0060.1007.

A Description
This special provision describes furnishing and installing Enhanced Catch Basin, Trapped Storm Structure, baffles, trap, and exterior cleanout at the depths and locations shown on the plans according to the pertinent provisions of standard spec 611 and as hereinafter provided.

B Materials
Furnish materials conforming to the requirements specified in standard spec 611.2.

Furnish SAFL Baffles and required hardware in Enhanced Catch Basin, Trapped Storm Structure as manufactured by Upstream Technologies Inc. or approved equal.

Furnish trap Assembly and exterior cleanout as identified in the plan.

C Construction
Construct catch basins as shown in the plans and according to standard spec 611.3. Install SAFL Baffle per manufacturer's specifications and as detailed in the plans. Install trap into the outlet pipe to the proposed storm sewer.

Furnish and install SAFL Baffles and required hardware per the manufacturer's specifications and as detailed in the plans.

D Measurement
The department will measure Enhanced Catch Basin, Trapped Storm Structure on a unit basis for each catch basin, 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.0060.1007	Enhanced Catch Basin, Trapped Storm Structure	Each

Payment is full compensation for providing all materials, including all masonry, conduit and sewer connections, trap connections, steps and other fittings; SAFL Baffle and hardware; for furnsihing all excavating, granular backfill, disposing of surplus material, and for cleaning out entire sump upon structure completion.

91. Storm Casting, Type MKE, Item SPV.0060.1008.

A Description
This special provision describes furnishing and installing storm castings, type MKE; according to the pertinent provisions of standard spec 611 and as hereinafter provided.

B Materials
Furnish materials conforming to what is shown in the drainage details.

C Construction
Install Storm Casting, Type MKE at locations shown in the drainage plans and details and according to standard spec 611.3.3.

D Measurement
The department will measure Storm Casting, Type MKE, on a unit basis for each downspout 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.0060.1008	Storm Casting, Type MKE	Each

Payment is full compensation according to the pertinent provisions of section 611.5.4.

92. Storm Casting, Type R-1878-A9L, Item SPV.0060.1009.

A Description
This special provision describes furnishing and installing storm castings, type R-1878-A9L; according to the pertinent provisions of section 611 and as hereinafter provided.

B Materials
Furnish materials conforming to what is shown in the drainage details.

C Construction
Install Storm Casting, Type R-1878-A9L at locations shown in the drainage plans and details and according to standard spec 611.3.3.

D Measurement
The department will measure Storm Casting, Type R-1878-A9L, on a unit basis for each downspout 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.0060.1009	Storm Casting, Type R-1878-A9L	Each

Payment is full compensation according to the pertinent provisions of standard spec 611.5.4.

93. Pavement Marking Grooved Preformed Thermoplastic Arrows Type 1, Item SPV.0060.1010; Arrows Type 2, Item SPV.0060.1011; Arrows Type 3, Item SPV.0060.1012; Arrows Type 4, Item SPV.0060.1013; Arrows Type 6, Item SPV.0060.1014; Words, Item SPV.0060.1015; Stop Line 24-Inch, Item SPV.0090.1001; Crosswalk 12-Inch, Item SPV.0090.1002.

A Description
This special provision describes grooving the pavement surface, and furnishing and installing preformed thermoplastic pavement marking as shown on the plans, according to section 647 of the standards specifications, 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 according 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 according 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.5.2 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.

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 conforming to standard spec 109.1.1.2.

The department will measure Pavement Marking Grooved Preformed Thermoplastic (Type) in length by the linear foot of tape placed, acceptably completed.

Bike lane symbols and bike lane arrows will both be measured as Pavement Marking Grooved Preformed Thermoplastic Symbols.

E Payment

The department will pay for plan and measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1010	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 1	Each
SPV.0060.1011	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 2	Each
SPV.0060.1012	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 3	Each
SPV.0060.1013	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 4	Each
SPV.0060.1014	Pavement Marking Grooved Preformed Thermoplastic Arrows Type 6	Each
SPV.0060.1015	Pavement Marking Grooved Preformed Thermoplastic Words	Each
SPV.0090.1001	Pavement Marking Grooved Preformed Thermoplastic Stop Line 24-Inch	LF
SPV.0090.1002	Pavement Marking Grooved Preformed Thermoplastic Crosswalk 12-Inch	LF

Payment is full compensation for cleaning and preparing the pavement surface, and for furnishing and installing the material.

94. Removing Downspout, From Cleanout to Bend, Item SPV.0060.1017.

A Description

This special provision describes removing downspouts (from the cleanout located approximately 2 to 3 feet above the ground to the first bend above the bridge pier footing) at the locations shown on the plans according to the pertinent provisions of standard spec 204 and as hereinafter provided.

B Materials

Remove downspout materials conforming to the requirements specified in standard spec 204.

C Construction

Remove downspouts as shown in the plans and according to standard spec 204.3.

D Measurement
The department will measure Removing Downspout, From Cleanout To Bend on a unit basis for removing each downspout (from the cleanout located approximately 2 to 3 feet above grade to first bend above the bridge piers), 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.0060.1017	Removing Downspout, From Cleanout To Bend	Each

Payment for Removing Downspout, From Cleanout To Bend is full compensation for breaking down, removing, closing, plugging, or sealing; for obtaining any required work permits; for hauling and disposing of materials; for backfilling and providing any required bentonite, soil, brick, concrete block, or concrete; and for restoring the ground to its original condition unless covered under other separate bid items.

95. Downspout Connection, From Cleanout to Bend, Item SPV.0060.1018.

A Description
This special provision describes furnishing and installing downspouts, from the cleanout located approximately 2 to 3 feet above grade to the downspout bend which will be either above, or at a side face of the pier foundation as shown on the drainage details; according to the pertinent provisions of standard spec 514 and as hereinafter provided.

B Materials
Furnish materials conforming to the requirements specified in standard spec 514.2.

C Construction
Construct Downspout Connection, From Cleanout To Bend, as shown in the drainage details and according to standard spec 514.3. Maximum desirable bends shall be 45 degrees. The engineer may approve a 90 degree bend if it is determined that a 45 degree bend is unusable.

D Measurement
The department will measure Downspout Connection, From Cleanout to Bend, on a unit basis for each downspout 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.0060.1018	Downspout Connection, From Cleanout to Bend	Each

Payment is full compensation for providing all materials, granular backfill, fabricating, cleaning, transporting, erecting, and for painting or zinc coating if required; including all fittings, bends, elbows, straps, anchors and bolts required for attaching the 8-inch proposed downspout.

96. Downspout Outfall Above Grade, Item SPV.0060.1019.

A Description
This special provision describes furnishing and installing downspouts, from the cleanout located approximately 2 to 3 feet above grade to the downspout bend which will be set at grade and discharge to landscaping on the drainage details; according to the pertinent provisions of standard spec 514 and as hereinafter provided.

B Materials
Furnish materials conforming to the requirements specified in standard spec 514.2.

C Construction
Construct Downspout Outfall Above Grade, as shown in the drainage details and according to standard spec 514.3.

D Measurement
The department will measure Downspout Outfall Above Grade, on a unit basis for each downspout 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.0060.1019	Downspout Outfall Above Grade	Each

Payment is full compensation for providing granular backfill, fabricating, cleaning, transporting, erecting, and painting or zinc coating if required; including all materials, fittings, bends, elbows, straps, anchors and bolts required for attaching the 8-inch proposed downspout.

97. Perennials Catmint, Walker's Low CG 1 Gal, Item SPV.0060.1020; Coreopsis, Moonbeam, CG 1 Gal, Item SPV.0060.1021; Daylilly, Strawberry Candy, CG 1 Gal, Item SPV.0060.1022; Goldenrod Fireworks CG 1 Gal, Item SPV.0060.1023; New England Aster, Purple Dome, CG 1 Gal, Item SPV.0060.1024.

A Description
This special provision describes furnishing and planting plants of the species, varieties and sizes specified and includes furnishing all necessary materials, excavating plant holes, backfilling, preparing Planting Mixture, mulching, fertilizing, watering, heeling in, disposing of surplus and waste materials, and as necessary, care and required replacements

pending acceptance at the locations shown on the plans, according to standard spec 632, and as hereafter provided.

B Materials
All plant material shall conform to standard spec 632.2. All plants shall be from 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 US Department of Agriculture, unless otherwise approved by engineer.

Conform to standard spec 632.2.2.4 regarding plant substitutions.

C Construction
For plant beds areas indicated on Drawings to receive Backfill for Plant Beds, 24-Inch Depth, prepare planting beds as directed in SPV.0035.1001 Backfill for Plant Beds. For all other plant bed areas, prepare planting bed Backfill Material and Planting Mixture according to standard spec 632. Construction shall conform to the requirements of standard spec 632.3.

D Measurement
The department will measure Perennials by the number of each individual Perennial, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item (all Perennials to be one gallon container-grown stock):

ITEM UMBER	Description	UNIT
SPV.0060.1020	Catmint, Walker's Low', CG 1 Gal.	Each
SPV.0060.1021	Coreopsis, Moonbeam, CG 1 Gal.	Each
SPV.0060.1022	Daylily, Strawberry Candy, CG 1 Gal.	Each
SPV.0060.1023	Goldenrod, Fireworks, CG 1 Gal.	Each
SPV.0060.1024	New England Aster, Purple Dome, CG 1Gal.	Each

Payment is full compensation for providing, transporting, handling, storing, placing and replacing plant materials; for excavating all plant holes, salvaging topsoil, mixing and backfilling; for providing and applying all required mulch; and for disposing of all excess and waste materials.

98. Ornamental Grasses Feather Reed Grass, CG 1 Gal, SPV.0060.1025; Indiangrass, CG 1 Gal, Item SPV.0060.1026; Little Bluestem, Carousel, CG 4" Pot, Item SPV.0060.1027; Little Bluestem, The Blues, CG 4" Pot, Item SPV.0060.1028; Prairie Dropseed, Tara Dwarf, CG 4" Pot, Item SPV.0060.1029; Switch Grass, Northwind, CG 1 Gal, Item SPV.0060.1030; Switch Grass, Shenandoah, CG 1 Gal, Item SPV.0060.1031.

A Description
This special provision describes furnishing and planting plants of the species, varieties and sizes specified and includes furnishing all necessary materials, excavating plant holes, backfilling, preparing Planting Mixture, mulching, fertilizing, watering, heeling in, disposing of surplus and waste materials, and as necessary, care and required replacements pending acceptance at the locations shown on the plans, according to standard spec 632, and as hereafter provided.

B Materials
All plant material shall conform to standard spec 632.2. All plants shall be frown 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 US Department of Agriculture, unless otherwise approved by engineer.

Conform to standard spec 632.2.2.4 regarding plant substitutions.

C Construction
For plant beds areas indicated on Drawings to receive Backfill for Plant Beds, 24-Inch Depth, prepare planting beds as directed in SPV.0035.1001 Backfill for Plant Beds. For all other plant bed areas, prepare planting bed Backfill Material and Planting Mixture according to standard spec 632. Construction shall conform to the requirements of standard spec 632.3.

D Measurement
The department will measure Ornamental Grasses by the number of each individual Ornamental Grass, acceptably completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item (all Ornamental Grasses to be one gallon container-grown stock):

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.1025	Feather Reed Grass, CG 1 Gal.	Each
SPV.0060.1026	Indiangrass, CG 1 Gal.	Each
SPV.0060.1027	Little Bluestem, Carousel, CG 4" Pot	Each
SPV.0060.1028	Little Bluestem, The Blues, CG 4" Pot	Each
SPV.0060.1029	Prairie Dropseed, Tara Dwarf, CG 4" Pot	Each
SPV.0060.1030	Switch Grass, Northwind, CG 1 Gal.	Each
SPV.0060.1031	Switch Grass, Shenandoah, CG 1 Gal.	Each

Payment is full compensation for providing, transporting, handling, storing, placing and replacing plant materials; for excavating all plant holes, salvaging topsoil, mixing and backfilling; for providing and applying all required mulch; and for disposing of all excess and waste materials.

99. Adjusting Water Boxes, Item SPV.0060.1032.

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 Jesse Hernandez, Milwaukee Water Works, at (414) 708-2670 (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 St. Materials being returned must be accompanied with a "surplus material" form completed by the Public Works Inspector assigned to the project.

C Construction

Adjust all water service boxes and water gate valve boxes within the project limits to the proposed elevations 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 boxes 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 Boxes 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.0060.1032	Adjusting Water Boxes	Each

Payment is full compensation for furnsihing all excavation, backfilling, disposal of surplus materials, water box clean-out, and for restoration of the work site.

100. Adjusting TES Manhole Covers, Item SPV.0060.1033.

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 according to the standard specifications, the provisions of the article Adjusting Manhole Covers, as shown on the plans, and as hereinafter specified.

B Materials

Furnish and install materials that conform to the requirements of s standard spec 519. Salvage and reinstall existing covers on the manholes. The city will supply covers designated for replacement. Contractor shall contact Mr. Ricardo Lopez, inventory clerk at (414) 286-6123 prior to obtaining the frames and lids from the Department of Public Works Field Headquarters at 3850 North 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 of Milwaukee Conduit Section (414) 286-3243 three 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, and 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 larger 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 all construction debris from manhole. Remove the temporary 3/4-inch plywood cover or equal which is over the existing electrical cables in the manhole as mentioned above.

Notify Ms. Karen Rogney three 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 underground operations.

D Measurement
The department will measure Adjusting TES Manhole Covers 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.0060.1033	Adjusting TES Manhole Covers	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.

101. Removing TES Manhole, Item SPV.0060.1034.

A Description
The work under this item describes removing various speed manholes for the City of Milwaukee Underground Conduit Department at locations shown in the plans, according to standard spec 204. Removal means removal of the existing structure and any necessary conduit alterations required.

B (Vacant)

C Construction Method
1. General Requirement
   Complete all operations necessary to remove the existing structure and that might endanger the new construction before constructing new work.

   Manholes designated for removal and subsequent reconstruction will ordinarily contain working cables which must be maintained during the course of this phase of work. Protective measures against damage must be observed when handling and working around these cables.

2. Frame and Cover Removal

   Remove the frame and cover on all manholes designated for removal. If the castings are to be salvaged as directed in the plans, exercise caution with frames embedded in concrete so unnecessary damage to the frame does not occur during the process of breaking concrete. Remove all mortar and concrete from the frame. Store salvaged castings at location approved of by the engineer.

3. Protection of Cables

   Extreme care must be exercised in the handling of working cables in manholes or exposed conduit package areas while removal work is going on. Cables may carry high voltage that may be life threatening.

   No cable removed from its racks and spanning the manhole opening is to be permitted to sag appreciably from its own weight across such opening. Provide temporary supports for all cables.

   When cables need to be moved, particularly lead sheathed cables, move cables slowly and bend gradually. Avoid sharp kinks that may damage inner core of cables and the sheath.

   Cables must be left as stationary as is practicable after the cables have been temporarily located. Exercise care if further shifting is required while construction work progresses and if needed, re-support.

   Guard against damage to the exposed cables by falling objects such as tools, equipment and debris. Avoid stepping on cables. Do not use cables to support any objects during the course of the construction work.

   Promptly notify Mr. Brian Pawlak at (414) 286-5970 work / (414) 708-2118 cell, of any visible cable defects discovered at the time the cable is exposed. Report any signs of abrasion, sheath rupture, kinking in the cable or evidence of sheath cracks.

   The contractor will be held liable for all damage due to carelessness and to neglect and is responsible for protecting and safeguarding cables. All damage will be repaired at the contractor's expense

4. Removing Existing Structure

   After removal of the castings and protecting and supporting the cables, carefully remove the manhole roof, walls, floor and all hardware. No portion of the existing structure is to remain. The increase in the size of the excavation will be determined by the size of the manhole to be reconstructed as indicated in the detail plans. Remove all waste material accumulated by the removal of the existing structure from the work site. No part of this waste material can be used as backfill material.

5. Conduit Alterations
   Break back by hand sections of cement encased conduit to facilitate excavation for the new proposed structure. Hand chip concrete away for the existing pipes. Carefully remove pipes from around the cables. Hand chip enough concrete away from the pipes to allow for the coupling of split ducts on to the ends of the pipes. Protect exposed pipe ends and existing cables from damage.

D Measurement

The department will measure Removing 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.0060.1034	Removing TES Manhole	Each

Payment is full compensation for breaking down and removing structure; conduit alterations; for providing cable protection; for hauling and disposing of materials.

102. Vibrating Wire Piezometer Instrumentation System, Delivered, Item SPV.0060.1035.

A Description

This special provision describes furnishing and delivering a vibrating wire piezometer instrumentation system a minimum of 21 days prior to start of wall construction. It also includes providing a technical assistance representative from the company to aid in piezometer installation and to provide on-site technical support. Perform all according to the plans and as provided herein.

B Materials

Materials for the vibrating wire piezometer system shall include six vibrating wire piezometers, one data recorder, two terminal boxes, and necessary appurtenances.

Vibrating Wire Piezometers: A total of six vibrating wire piezometers shall be Geokon Model 4500S, 100 psi range (Geokon Incorporated, 48 Spencer Street, Lebanon, NH 03766, (603) 448-1562) or Slope Indicator Part Number 52611030 (Slope Indicator Company, 316 Forsyth Street, Raleigh, NC 27609-6314, (800) 929-4712), or an approved equal.

Each vibrating wire piezometer shall meet the following specifications:

Pressure Range (psi):	0-100
Over Range/Maximum Pressure:	2X rated pressure range
Resolution:	0.025% full scale (F.S.) minimum
Accuracy:	±0.1% of F.S.
Operating Temperature:	-20 °F to 150 °F
Thermal Zero Shift:	<0.05% F.S./°C or <0.04 psi/°C
Cable:	Four conductor, 20 or 22 gauge shielded cable with polyethylene jacket or an approved equal, connection between cable and instrument factory sealed (see table below for required length of cable)
Filter:	50 micron sintered stainless steel
Diameter of piezometer:	0.75 inches

Provide a canvas bag, 2½-inch by 18-inch, with each piezometer.

Calibrate all piezometers at the factory. Make calibrations while pressure is both increasing and decreasing for at least two cycles, to document hysteresis throughout the maximum range of the instrument. Take readings at a minimum number of eight equal increments, and require the manufacturer to supply a calibration curve with data points clearly indicated, and a tabulation of the data. Use the data recorder that is to be supplied under this item number during the factory calibrations. Make readings at a sufficient number of different temperatures which range from -20 °F to 120 °F to provide a calibration curve, and substantiate it, indicating the effect of temperature change on the instruments. Mark each piezometer with a unique identification number.

Signal cables and mechanical waterproof seals between the cable and the piezometer for each of the vibrating wire piezometers shall be factory installed. No splices shall be allowed. All cables shall be terminated with connectors compatible with terminal boxes furnished under this item. The required cable lengths shall be determined to extend from the tip of the piezometers to the ground level to the location of the readout box.

Feature	Station	Offset	Estimated Tip Elev.
R-40-629	205+10 LE	40 feet RT	565
R-40-629	205+10 LE	40 feet RT	576
R-40-629	205+95 LE	15 feet LT	565
R-40-629	205+95 LE	15 feet LT	576

Data Recorder: The data recorder shall include a battery charger, adaptors, and cables necessary for field operation, and the computer software required for downloading the data to an IBM compatible personal computer. The software shall also be capable of generating reports and annotated graphs from the data. Acceptable readout and data loggers include Geokon Model GK-403 (Portable Readout Unit and SPLIT Data Formatting Software), Slope Indicator Part Numbers 52620900 AND 52620920 (VS Datamate and Datamate Manager Software), or an approved equal.

The data recorder shall have waterproof seals incorporated into its face place, switches and input connectors. It shall have a backup power source or battery which will keep data secure if the main battery should become discharged. It shall have the capacity of manually recording a minimum of 250 readings, and of automatically recording data at any interval specified and entering a low power mode between the readings taken. It shall have the electronic transfer capability of linking itself and a personal computer for data transfer. Include an interface cable. It shall be able to do the following: display battery charge, display internal temperature and humidity, set date and time, display all data in its memory, and adjust viewing angle of display. It shall have a backlit display. It shall be able to display pore water pressure readings in standard English and metric units of pressure, and temperature readings in degrees Celsius and degrees Fahrenheit.

The data recorder shall also meet the following specifications:

Temperature Range:	Fully operable from -4 ºF to 120 ºF
Excitation Range:	450 - 6000 Hz
Resolution:	0.01% Full Scale
Weight :	˜ 12 lb

Two Terminal Boxes: Acceptable terminal boxes shall be Geokon Terminal Box Model 4999, Slope Indicator Terminal Box 57711600, or an approved equal. The terminal box enclosures shall be constructed of baked enamel coated steel or fiberglass, and shall be waterproof. Each box shall handle a minimum of six 4-conductor sensors. Cable entries on each box shall have watertight cable glands fixed in place with strain reliefs. The boxes shall be modified as necessary to permit connection to the data recorder. Protect each terminal box from lightening damage by installing at the factory surge arrestors, and with a ground rod and grounding cable.

Furnish the engineer for approval, a minimum of 14 days prior to delivery of the vibrating wire piezometer instrumentation system to the site, the following:

1. Name and phone number of manufacturer's designated technical assistance representative.
2. Manufacturer's certifications for all components of the system.
3. Factory calibration certifications for all components of the system.
4. Factory quality assurance checklist.
5. Factory pre-shipment inspection checklist.
6. Factory warranties for all components of the system.

7. Shipping documents and shipping schedule.
8. Unique instrument identification numbers for all components, and
9. Instruction manuals for each component of the system supplied by the manufacturer.
10. The location of the readout boxes for the individual areas.
11. Include a comprehensive instruction manual with the vibrating wire piezometer instrumentation system. It shall contain the following: (1) *theory of operation*, i.e. the basic measuring principle of the instrument with appropriate illustrations, limitations of the instrument, factors which may affect measurement uncertainty, and a specification sheet; (2) *calibration procedures*, i.e. step-by-step acceptance test procedures to ensure correct functioning when the instrument is first received, procedures for performing calibration checks, and procedures for regular calibration of the readout and data logger; (3) *installation procedures*, i.e. step-by-step procedure for installation, with illustrations of the system and its components, showing correct juxtaposition when installed, and statement of all factors that should be recorded during installation for later use during data evaluation; (4) *maintenance procedures and trouble-shooting guide* with names, addresses, and telephone numbers of instrument service representatives; (5) *data collection procedures*, i.e. cautions pertaining to personnel and equipment, procedure for obtaining initial reading, procedure for obtaining readings subsequent to initial readings, listing of equipment and tools required during instrument reading, a field data sheet, and a sample completed field data sheet; and (6) *data processing, presentation, and interpretation procedures*, i.e. data calculation sheet, step-by-step calculation procedure, instruction manual(s) for software supplied by the manufacturer, sample data calculations, alternative methods of plotting the data, sample data plots, and notes on data interpretation.

There shall be a product warranty on all parts of the vibrating wire piezometer instrumentation system of a minimum of one year from the date of delivery to the department against defects in materials and workmanship.

All components of the Vibrating Wire Piezometer Instrumentation System shall be made by the same manufacturer. Each component of the Vibrating Wire Piezometer Instrumentation System shall bear markings to clearly identify it with the manufacturer's certifications previously furnished to the engineer. The term *approved equal* shall be understood to indicate that the *equal* product shall meet all of the specifications, and shall be the same or superior to the products named previously in the specifications in function, performance, accuracy, tolerances, and general configuration. The engineer shall make the final determination if the approved equal is acceptable. Components which do not meet the requirements of the specifications shall be unacceptable and will be rejected by the engineer. The engineer reserves the right to prohibit delivery of any component until certifications provided by the manufacturer, and supplied by the contractor, indicates full compliance with the specifications.

Technical Support: Make available an on-site technical assistance representative from the manufacturer which supplies the Vibrating Wire Piezometer Instrumentation System to instruct the contractor on how to install the first vibrating wire piezometer installed on the project. Also make available on-site the technical assistance representative to assist in the final connections of the vibrating wire piezometer cables to the terminal boxes during construction operations and to assist in initial calibration and reading of the instrumentation.

C (Vacant)

D Measurement
The department will measure Vibrating Wire Piezometer Instrumentation System Delivered 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.0060.1035	Vibrating Wire Piezometer Instrumentation System	Each

Payment is full compensation for furnishing and delivering all components of the Vibrating Wire Piezometer Instrumentation System for the project, and for providing technical support at the project site.

103. Precast Concrete Wheel Stop, Item SPV.0060.1036.

A Description
This special provision describes furnishing and installing a precast concrete wheel stop at locations shown on the plans and as hereinafter provided.

B Materials
Provide concrete masonry according to standard spec 501.

Furnish and install materials as detailed on the construction plans, shown in the construction details, and as specified by the engineer.

C Construction
Drill one-inch diameter holes into the ground 2'-5" deep. Space holes at 5 feet. Each precast concrete wheel stop will be secured with two #6 rebar anchors as shown in the construction detail.

Each concrete wheel stop will have two drainage block outs and two #3 rebar reinforcements as shown in the construction detail.

D Measurement
The department will measure Precast Concrete Wheel Stop by each 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.0060.1036	Precast Concrete Wheel Stop	Each

Payment is full compensation for furnishing and installing each precast concrete wheel stop.

104. Sign Supports, Aluminum Round Pipe, 2 Inch x 9.5 Feet, SPV.0060.1037.

A Description
This special provision describes furnishing and installing round aluminum pipe 2 inch by 9.5 feet long. Installation shall be according to standard spec 634 and as hereinafter provided. Mounting of signs to steel posts shall be according to City of Milwaukee standards and State sign installation plates herein provided.

B Materials
Provide materials according to standard spec 634 and as herein provided in the description. Furnish round aluminum pipe 2 inch by 9.5 feet long Schedule 40 (2.375 inch O.D x 2.067 inch I.D x 0.154 inch wall x 9.5 feet long with plane ends. The post will fit into sockets furnished by the City of Milwaukee, Kevin Antczak, (414) 286-3236. Contact Kevin to obtain the sockets for the aluminum posts.

Install City of Milwaukee date stickers on all signs on Lincoln Memorial Drive and on Clybourn Street. Signs on all exit and entrance ramps shall have WisDOT date and vandalism stickers. The City of Milwaukee (contact Kevin Antczak) will furnish the date stickers for contractor installed signs that are on the city jurisdiction roadways. WisDOT will furnish the WisDOT date stickers for contractor installed signs that are on WisDOT jurisdiction roadways per standard spec 637.

C (Vacant)

D Measurement
The department will measure Sign Supports Aluminum Round Pipe 2 Inch x 9.5 Feet for each individual special mounting, acceptably installed which includes the socket (furnished by the city of Milwaukee) and the aluminum pipe (furnished by the contractor). The complete system shall be installed by the contractor.

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	Sign Supports Aluminum Round Pipe 2 Inch x 9.5 Feet	Each

Payment is full compensation furnishing, hauling, and placing posts; for providing all materials, including hardware.

105. Sign Supports, Special Mounting, SPV.0060.1038.

A Description
This special provision describes installing special sign supports per detail in contract plans to back of barrier wall. Mounting to be according to detail in contract plans, and as hereinafter provided.

B Materials
Post shall be 4 x 6 wood post according to standard spec 634.

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.0060.1038	Sign Supports, Special Mounting	Each

The payment is full compensation providing, hauling, and placing posts; for providing all materials, including hardware and anchors.

106. Internal Sanitary Manhole Seal, Item SPV.0060.1039.

A Description
The work under this item consists of furnishing and installing internal manhole chimney seal for each adjusted sanitary manhole.

B Material
An internal sanitary manhole seal shall be used as shown in the detail.

Manhole Cover shall be Type MS-58A with concealed pick.

C Construction
The inside diameter of the manhole frame and the manhole chimney shall be field measured, and a determination as to whether the inside face of the frame is vertical or tapered shall be made in order to obtain the proper size and shape rubber seal.

Install internal rubber chimney seals no sooner than 24 hours following chimney back plastering.

The surfaces against which the sleeve is to be compressed shall be circular, clean, reasonably smooth and free of any loose materials and excessive voids. Repair flaws in these surfaces with the approved low-shrink mortar or grind smooth. Apply a bead of butyl rubber caulk conforming to ASSHTO M-198 Type B to the lower sealing surface of sleeve.

Install the seal according to the manufacturer's instructions. (Refer to the plan data for configuration of chimney seal.)

D Measurement
The department will measure Internal Sanitary Manhole Seal 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.0060.1039	Internal Sanitary Manhole Seal	Each

Payment is full compensation for the furnishing and installing internal rubber chimney.

107. 4-ft Diameter Sanitary Manhole with Internal Seal, Item SPV.0060.1040.

A Description
This work includes constructing a new sanitary manhole for each new sanitary lateral in East Clybourn Street at the location and grade as shown in the plans.

B Materials
Furnish precast manhole as described in section 8.39.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments.

Install frame and cover type MS 58A as shown in the detail.

Install internal sanitary manhole chimney seal as shown in the detail.

C Construction
Work shall be completed according to Section 3.5.3 of the Standard Specifications for Sewer and Water Construction in Wisconsin, latest edition and amendments.

D Measurement
The department will measure 4-ft Diameter Sanitary Manhole with Internal Seal, 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.0060.1040	4-ft Diameter Sanitary Manhole with Internal Seal	Each

Payment is full compensation for furnishing and installing manhole, cover, frame, for furnsihing all excavation and backfill, steps, installing any adjustment rings and frame/chimney seals; for disposal of surplus material, cleanup, and for restoring site work.

108. Masonry Column, 8-FT HT, Item SPV.0060.1041.

A Description

This special provision describes furnishing and installing masonry column, 8-FT HT which consists of a rectangular brick veneer column with cast-in-place concrete foundation and base, and precast concrete cap. Column design shall match the existing Summerfest 8-ft ht masonry columns as closely as possible. Column Drawing details and specifications below have been provided by Summerfest for reference and to show general design intent. Contractor shall field-verify and match all existing column materials, sizes, hardware, colors, finishes, and styles with new masonry columns. Contact Robert Gosse, Director of Design and Construction, Milwaukee World Festival, Inc., 200 N. Harbor Drive, Milwaukee, WI 53202, Office: (414) 287-4466 to coordinate matching the existing Summerfest fencing.

B Materials

Concrete Masonry Units

Concrete Masonry Unit minimum compressive strength shall be 1,500 psi; ASTM C90 normal weight.

Brick Veneer Units

Architectural face brick to be Extruded Brown Light Texture Clay Brick, Coppertone Velour Modular (Actual dimensions: 3 ½" x 2 ¼" x 7 ½") as manufactured by Endicott. 844-320-0358 or approved equal. ASTM C 216, Grade SW, Type FBX.

Compressive Strength: Provide units with minimum average net-area compressive strength of 8000 psi minimum.

Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.

Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

Mortar and grout materials

Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.

Mortar and grout color to match existing.

Hydrated Lime: ASTM C 207, Type S.

Masonry Cement: ASTM C 91.
Mortar Pigments: Iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
Available Products:

- Bayer Corporation, Industrial Chemicals Div.; Bayferrox Iron Oxide Pigments.
- Davis Colors; True Tone Mortar Colors.
- Solomon Grind-Chem Services, Inc.; SGS Mortar Colors.
- Approved equal.

Colored Cement Product: Packaged blend made from portland cement and lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
Available Products:

Colored Portland Cement-Lime Mix:
- Lafarge North America Inc.; Eaglebond
- Lehigh Cement Company; Lehigh Custom Color Portland/Lime Cement.
- Approved equal.

Colored Masonry Cement:
- Lafarge North America Inc.
- Lehigh Cement Company; Lehigh Custom Color Masonry Cement.
- Approved equal.

Aggregate for Mortar: ASTM C 144.
For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

Aggregate for Grout: ASTM C 404.

Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

Water: Potable.

Reinforcement
Uncoated Steel Reinforcing Bars: ASTM A 615 or ASTM A 996, Grade 60.
Masonry Joint Reinforcement: ASTM A 951; mill galvanized, carbon-steel wire for interior walls and hot-dip galvanized, carbon-steel wire for exterior walls.
Wire Size for Side Rods: W2.8 or 0.188-inch diameter.
Wire Size for Cross Rods: W1.7 or 0.148-inch diameter.

Wire Size for Veneer Ties: W2.8 or 0.188-inch diameter.
Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.
Multiwythe Masonry: Adjustable (two-piece) type, with one side rod at each face shell of backing wythe and with ties that extend into facing wythe. Ties engage eyes or slots in reinforcement and extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face

Wall Ties and Anchors
Materials: Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153/A 153M, Class B-2 coating.

Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.

Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.
Wire: Fabricate from 3/16-inch- diameter, hot-dip galvanized steel wire.

Adjustable Masonry-Veneer Anchors:
General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

- Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.

Embedded Flashing Materials
Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with Division 07 Section "Sheet Metal Flashing and Trim."

Metal Drip Edges: Fabricate from stainless steel. Extend at least 3 inches into wall and ½ inch out from wall, with outer edge bent down 30 degrees and hemmed.
Metal Flashing Terminations: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 3/8 inch to form a stop for retaining sealant backer rod.

Flexible Flashing: For flashing not exposed to the exterior, use one of the following, unless otherwise indicated:
Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.

Available Products:

- Advanced Building Products Inc.; Peel-N-Seal.
- Carlisle Coatings and Waterproofing; CCW-705-TWF Thru-Wall Flashing.
- Dayton Superior Corporation, Dur-O-Wal Division; Dur-O-Barrier-44.
- Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Perm-A-Barrier Wall Flashing.
- Heckmann Building Products Inc.; No. 82 Rubberized-Asphalt Thru-Wall Flashing.
- Hohmann & Barnard, Inc.; Textroflash.
- Polyguard Products, Inc.; Polyguard 300.
- Polytite Manufacturing Corp.; Poly-Barrier Self-Adhering Wall Flashing.
- Williams Products, Inc.; Everlastic MF-40.
- Approved equal.

Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer.

Miscellaneous Masonry Accessories

Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene .

Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall.

Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

Weep/Vent Products: Use one of the following, unless otherwise indicated:
Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches long.

Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity. Provide strips, not less than 1-1/2 inches thick and 10 inches wide, with dimpled surface designed to catch mortar droppings and prevent weep holes from being clogged with mortar.

Available Products:

- Advanced Building Products Inc.; Mortar Break.
- Archovations, Inc.; CavClear Masonry Mat.
- Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
- Mortar Net USA, Ltd.; Mortar Net.
- Approved equal

Masonry Cleaners

Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains from new masonry without damaging masonry. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

- Available Manufacturers:
- Diedrich Technologies, Inc.
- EaCo Chem, Inc.
- ProSoCo, Inc.
- Approved equal

Mortar and Grout Mixes

General: Do not use admixtures, unless otherwise indicated.
Do not use calcium chloride in mortar or grout.
Limit cementitious materials in mortar for exterior and reinforced masonry to portland cement and lime.
Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification.
For masonry below grade or in contact with earth, use Type M.
For reinforced masonry, use Type S.

Pigmented Mortar: Use colored cement product [or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products].

Pigments shall not exceed 10 percent of Portland cement by weight.
Pigments shall not exceed 5 percent of masonry cement by weight.

Grout for Unit Masonry: Comply with ASTM C 476.
Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

Precast Concrete Cap

Fabricators:

1. Stonecast Products, Inc.
   P.O. Box 97
   N112 W14343 Mequon Road Germantown, WI 53022
   (262)-253-6600
   (262)-253-0500 – Fax

2. Edwards Cast Stone Company 777 Edwards Road
   Dubuque, Iowa 52003
   (563)-556-0535

3. Approved equal.

Cement: ASTM C150, Type 1A – air entraining, Portland type; color to be Limestone as defined by Stonecast Products, Inc. or other to match existing masonry column caps.

Texture to match existing masonry column caps.

Finishes: Finished exposed-face surfaces of architectural precast concrete units to match existing precast caps.

Smooth-Surface Finish: Provide surfaces free of pockets, sand streaks, and honeycombs, with uniformed color and texture.

Finish of exposed back surfaces of precast architectural to match face surface finish.

Reinforcing Bars: ASTM 615, Grade 60, deformed; epoxy-coated

Grout material: Nonmetallic, Non-shrink Grout, Premixed nonmetallic, noncorrosive, non-staining grout containing selected silica sands, Portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents,, complying with ASTM C 1107, of consistency suitable for application, and a 30-minute working time.

Quality-Control Testing: Test and inspect architectural precast concrete according to MNL-117 requirements.

Strength of architectural precast concrete units will be considered deficient when they fail to comply with ACI 218 (ACI 318M) requirements.

Concrete Materials:
Portland Cement: ASTM C150, Type I or Type III provided white cement or gray as required by mix designs.

Use only one brand, type, and color of cement from the same mill throughout project.

Coloring Agent: ASTM 979, synthetic mineral oxide pigments or colored water- reducing admixtures, color stable, nonfading, resistant to lime and other alkalis.

Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C 33, with coarse aggregates complying with Class 5S.

Face-Mix Fine Aggregates: Selected, natural or manufactured sand of the same material as coarse aggregate, unless otherwise approved by Architect.

Water: Potable; free from deleterious materials that may affect color stability, setting, or strength of concrete.

Air-Entrained Admixture ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

Water-Reducing Admixture: ASTM C 494, Type A

Retarding Admixture: ASTM C 494, Type B

Water-Reducing and Retarding Admixture: ASTM C 494, Type D

High-Range, Water-Reducing Admixture ASTM C 494, Type F

High-Range, Water-Reducing, and Retarding Admixture: ASTM C 494, Type G

Air Entrainment Admixture: ASTM C260.

Concrete Mix: Minimum 5000 psi 28 day strength, air entrained to 6 percent.
Use rigid molds, constructed to maintain unit uniform in shape, size and finish.

Surface finish aggregate: clean, smooth finish from single source throughout conforming to ASTM C33.

Quality Control
Fabrication tolerances: Fabricate precast architectural concrete units straight and true to size and shape with exposed edges and corners precise and true so each finished panel complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.

Qualifications: Precast Concrete Manufacturer and Trade Contractor must have a minimum of 5 years of successful experience on projects of similar magnitude and complexity to that of this Project. Manufacturer and contractor to be prequalified by owner's representative prior to bidding. Failure to prequalify will void bid.

Examination: Examine substrates and conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance of architectural precast concrete units. Do not proceed with installation until satisfactory conditions have been corrected.

Do not install architectural precise units until supporting masonry has attained minimum allowable design compressive strength.

Defective Work: Discard architectural precast concrete units that do not conform to requirements, including strength, manufacturing tolerances, and finishes. Replace with architectural precast concrete units that meet requirements.

Submittals

Shop Drawings: Indicate on shop drawings, detailed plan view layout, cross sections and dimensions for one entire Masonry Column including: brick veneer, mortar joints, foundation, reinforcing steel, precast concrete cap (including drip edge detail), cast-in-place concrete base, concrete masonry units, reinforcing, flashings, weep vents, and related accessories. Submit to the engineer for written approval prior to construction.

Product Data: Submit data on brick masonry to the engineer for written approval prior to construction.

Samples: Submit the following samples to the engineer for written approval prior to construction:

- Two full sized brick masonry unit sample pieces.
- Sample of mortar and grout color.
- Minimum 6" x 6" sample of precast concrete cap and precast concrete base.

Mock-up: Construct mock-up for one entire masonry column, 8-FT HT on first column to be constructed. Coordinate mock-up with precast concrete cap. Mock-up to include brick veneer, mortar joints, foundation, reinforcing steel, precast concrete cap, cast-in-place concrete base, concrete masonry units, reinforcing, flashings, weep vents, and accessories.

Approval of mock-up is required prior to beginning construction. Failure to receive mock-up approval may result in rejection of work. The approved mock-up will be the standard from which the work will be judged and approved by the engineer. Incorporate accepted mockup as part of work.

Locate mockup where directed by the engineer.

Notify the engineer a minimum of seven days in advance of dates and times when mock ups will be constructed.

C Construction

Concrete Masonry Units

Concrete Masonry Units shall be constructed as shown on the contract documents. Place reinforcing as indicated on construction documents and support from displacement.

Brick Veneer Units

The brick masonry shall be constructed at the location, grade and dimensions shown on the plan and as directed by the engineer.

Mortar and Grout Materials
Install as indicated on construction documents and according to manufacturer recommendations

Reinforcement, Wall Ties and Anchors
Install as indicated on construction documents.

Masonry Cleaners
Apply as necessary to ensure all finished surfaces are free of marks, stains, construction-related residue, and visual blemishes. Use according to manufacturer recommendations.

Precast Concrete Cap
The Precast Panel shall be constructed at the location, grade and dimensions shown on the plan and as directed by the engineer

Cast-in-place Concrete Base
The cast-in-place concrete base shall be constructed at the locations, grade and dimensions shown on the Drawings and according to the Standard Specifications.

D Measurement
The department will measure Masonry Column, 8-FT HT 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.0060.1041	Masonry Column, 8-FT HT	Each

Payment is full compensation for furnishing and installing, providing all excavation and removal of existing soils, materials, samples, mock-ups, and shop drawings.

109. Salvage Crash Cushions Temporary, Item SPV.0060.1043.

A Description
This special provision describes salvaging temporary crash cushions and moving to the locations as shown on the plans according to standard spec 614.

The crash cushion temporary becomes the property of the department upon substantial completion.

B Materials
Furnish any replacement materials for the salvage crash cushions temporary according to the pertinent requirements of standard spec 614.2.

C Construction
The contractor shall remove, handle, store and reinstall existing crash cushions. Reinstall the temporary crash cushion according to standard spec 614.3.4.

D Measurement
The department will measure Salvage Crash Cushions Temporary as each individual crash cushion, 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.0060.1043	Salvage Crash Cushions Temporary	Each

Payment is full compensation for removing the existing crash cushion, for transporting and storing, for installing, and for providing all other required materials needed to install the crash cushion in the final location.

110. 4' Diameter "Doghouse" Manhole Type TES, Item SPV.0060.1045.

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, according to standard spec 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 St. 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. Conduit will be accepted on the basis of a Manufacturer's Certificate of Compliance and WISDOT field inspection upon delivery to a project.

Manufacturers of PVC Conduit DB-60 shall request evaluation and approval of their products by filing with the department's Research Supervisor, Bureau of Highway Construction, a certificate setting forth the name or brand of pipe to be furnished, the specified type, category, grade and PVC plastic cell classifications. The certificate shall have attached a certified test report from an approved independent testing laboratory showing specific results of tests performed on each diameter conduit to be furnished conforming to all requirements of these specifications. The conduit tested shall be randomly selected for test by the independent testing laboratory as being representative of that manufacturer's conduit. The manufacturer of the conduit shall also submit with the certification, a guarantee that all conduit furnished be of the same quality and composition and conform to the specification requirements as tested by the independent laboratory, as long as the manufacturer continues to furnish materials for WISDOT projects.

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 according 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.0060.1045	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.

111. 5' Diameter "Doghouse" Manhole Type TES, Item SPV.0060.1046.

A Description

The work under this item consists of a 5'-0" round "doghouse" manhole for the City of Milwaukee Underground Conduit Section at locations shown in the plans, according to standard spec 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 two 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 both located in 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 St. 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. Conduit will be accepted on the basis of a Manufacturer's Certificate of Compliance and WISDOT field inspection upon delivery to a project.

Manufacturers of PVC Conduit DB-60 shall request evaluation and approval of their products by filing with the department's Research Supervisor, Bureau of Highway Construction, a certificate setting forth the name or brand of pipe to be furnished, the specified type, category, grade and PVC plastic cell classifications. The certificate shall have attached a certified test report from an approved independent testing laboratory showing specific results of tests performed on each diameter conduit to be furnished conforming to all requirements of these specifications. The conduit tested shall be randomly selected for test by the independent testing laboratory as being representative of that manufacturer's conduit. The manufacturer of the conduit shall also submit with the certification, a guarantee that all conduit furnished be of the same quality and composition and conform to the specification requirements as tested by the independent laboratory, as long as the manufacturer continues to furnish materials for WISDOT projects.

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 according 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 5’ 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.0060.1046	5’ 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.

112. 4’ Diameter Manhole Type TES, Item SPV.0060.1047.

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, according to standard spec 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 St. 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 according 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.0060.1047	4-FT Diameter Manhole Type TES	Each

Payment is full compensation for furnsihing 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.

113. Floor Drain Special, Item SPV.0060.2001.

A Description
This special provision describes furnishing and installing bridge floor drains according to standard spec 514, as shown on the plans, and as hereinafter provided.

B Materials
Furnish floor drain material conforming to standard spec 514.2.

C Construction
All construction methods shall conform to standard spec 514.3.

D Measurement
The department will measure Floor Drain Special by each floor drain, acceptably completed, according 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.0060.2001	Floor Drain Special	Each

Payment is full compensation for providing Floor Drain Special.

114. Floor Drain Grate Steel, Item SPV.0060.2002.

A Description
This special provision describes fabrication, delivery, and installation of new floor drain grates for existing drains. All work shall be according to the plans, and as hereinafter provided.

B Materials
Furnish ASTM A36 steel according to the pertinent requirements of standard spec 506.2.2.

C Construction
Fabricate floor drain grates according to standard spec 506.3 and 514.3 and as specified on the plans. Deliver and install floor drains into grade-adjusted floor drain frames.

D Measurement
The department will measure Floor Drain Grate Steel by each 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	Floor Drain Grate Steel	Each

Payment is full compensation for fabricating; delivering; and installing new floor drain grates.

115. Bearing Elastomeric Expansion, Item SPV.0060.2003.

A Description
This special provision describes furnishing and installing new elastomeric expansion bearings as shown on the plans, according to standard spec 506 and as hereinafter provided.

B Materials
Furnish laminated elastomeric bearing, high strength steel sole plate, high strength steel side retainer plates and masonry plates, carbon steel anchor rods, nuts, and washers of the size and quantity on the plans that are according to the pertinent requirements of standard spec 506. Galvanize each component of the side retainers and the bolt assemblies according to these specifications. Prime and paint high strength steel sole plate and side retainer plates according to standard spec 517.

C Construction
Remove all loose dirt and debris from the top of the sole plate and bottom of bottom flange surfaces that will contact each other shown on the plans. Field-weld the sole plate to the bottom flange using an E70XX electrode as shown on the plans. Where the thickness of the sole plate shown on the plans is less than 1-1/2” welding procedures shall be established by the contractor to restrict the maximum temperature reached by the surface in contact with the elastomer to 200°F (93°C). Control temperatures with temperature indicating wax pencils or other suitable means approved by the engineer.

Prior to girder erection remove all loose debris from bearing seat. At the shiplap joint remove existing concrete pedestals that conflict with the location of the new masonry plates using 30lb chipping guns or bush hammers. Care should be taken to avoid damaging the existing remaining concrete. The finished bearing surface should follow the cross-slope of the existing shiplap. Use non shrink grout or other approved material to provide a smooth bearing surface.

Locate existing reinforcement in the existing concrete shiplap using ground penetrating radar or other means approved by the engineer prior to drilling holes for anchor rods. Avoid drilling holes that interfere with existing reinforcement once existing reinforcement

bars have been located in the vicinity of each bearing. Fill any unused holes with non-shrink grout approved by the engineer.

After girder erection drill and install anchor rods and side retainer plates according to the provisions of standard spec 502.3.14.

Install anchor rods and side retainers prior to pouring the deck concrete.

D Measurement
The department will measure Bearing Elastomeric Expansion as a unit for each individual bearing 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.0060.2003	Bearing Elastomeric Expansion	Each

Payment is full compensation for furnishing and installing elastomeric bearings, side retainers, masonry plates, and anchor rod assemblies. Drilling and grouting anchor rods, ground penetrating radar or other means used for locating existing reinforcement, and finishing the concrete shiplap bearing seats where needed shall be considered incidental to this item.

116. Bearing Elastomeric Fixed, Item SPV.0060.2004.

A Description
This special provision describes furnishing and installing new fixed elastomeric bearings as shown on the plans, according to standard spec 506 and as hereinafter provided.

B Materials
Furnish laminated elastomeric bearing, high strength steel sole plate, carbon steel anchor rods, nuts, and washers of the size and quantity on the plans that are according to the pertinent requirements of standard spec 506. Galvanize each component of the bolt assemblies according to these specifications. Prime and paint high strength steel sole plate according to standard spec 517.

C Construction
Remove all loose dirt and debris from the top of the sole plate and bottom of bottom flange surfaces that will contact each other shown on the plans. Field-weld the sole plate to the bottom flange using an E70XX electrode as shown on the plans.

Prior to girder erection remove all loose debris from bearing seat. After girder erection drill and install anchor rods according to the provisions of standard spec 502.3.14.

Install anchor rods prior to pouring the deck concrete.

D Measurement
The department will measure Bearing Elastomeric Fixed as a unit for each individual bearing 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.0060.2004	Bearing Elastomeric Fixed	Each

Payment is full compensation for furnishing and installing elastomeric bearings and anchor rod assemblies. Drilling and grouting anchor rods shall be considered incidental to this item.

117. Lamp Disposal High Intensity Discharge, Item SPV.0060.3001.

A Description
This special provision describes packaging, palletizing, and returning HID (metal halide; mercury vapor and high-pressure sodium) lamps removed under this contract to the department at one of the facilities as directed by the engineer.

B (Vacant)

C Construction
Lamps, which the contractor turns in to the department, will be considered the property of the department for proper future disposal. The contractor will have no further obligation for their disposal. The department will reject improperly packaged lamps.

Deliveries to the department shall be prearranged. Consolidate deliveries into a truckload or more, except that where all the lamps removed under a contract measure less than a truckload, deliver all of them as one load at one time.

Pack intact lamps in the packaging of the new lamps used to replace the old lamps, or packaging affording the equivalent protection. Deliver in full, stackable cartons with the name of the contractor written on each carton.

Pack broken lamps into thick plastic bags, and in turn place the bags inside sturdy cardboard boxes or the equivalent. Mark the outer packaging "broken lamps." The department will reject metal containers.

Deliver all broken lamps, as noted above. The department will not pay for broken lamps above a level of ten percent of the total number in the contract. Deliver broken lamps above the ten percent level to the department for no compensation.

If palletized, pile cartons no more than two high and secure them to prevent shifting or falling loads.

The department will reject any lamps not removed as part of a contract pay item or otherwise required under this contract.

D Measurement
The department will measure Lamp Disposal High Intensity Discharge by each unit delivered to the department properly packaged, 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	Lamp Disposal High Intensity Discharge	Each

Payment is full compensation for packaging, palletizing and delivering lamps.

118. Cable Splice at Handhole or Light Pole Pedestal, Item SPV.0060.3002.

A Description
This special provision describes materials, general requirements, personnel qualifications, construction methods, and testing requirements used to perform electrical work required for cable splicing at handholes and light pole pedestal bases. All work shall be according to standard spec 651.

B Materials
Furnish materials conforming to the WSEC, consisting of chapter comm. 16 of the WEC combined with the NEC.

All materials furnished under this contract for street lighting installation are subject to approval by the City of Milwaukee street lighting engineer.

Furnish a complete list of materials to be furnished and used for street lighting. Such list shall include names and addresses of manufactures, together with catalog numbers, certificates of compliance, specifications, and other product information requests by the engineer. Submit the list within ten calendar days of execution of contract. Do not incorporate any material into the lighting system prior to the written approval of the engineer. Approval does not change the intent of the specifications. Do not substitute or make changes in material without resubmitting for approval.

C Construction
General Requirements
Work under items related to the street lighting system shall conform to the National Electrical Code (NEC), 2011 Edition, or the latest edition adopted by the State of Wisconsin, Wisconsin Department of Commerce Chapter Comm 16 (Electrical) State of Wisconsin electrical code, City of Milwaukee code, and these special provisions and good electrical practices. The contractor shall not take advantage of lack of details in plans or these specifications where to do so would conflict with the applicable code and standards.

Personnel Qualifications
An electrician holding all appropriate licenses (including City of Milwaukee Licenses) shall supervise all work done referring to the street lighting system. All splices shall be made by an electrician. For the purposes of this contract, an electrician is a person who served a four year apprenticeship and passed state exams.

Splices
Make splices only in the metal pedestal cabinet, or within the hand hole of the pole. Cable runs shall be continuous between pole locations, and no splicing of cable will be allowed. Splices made in the locations other than the metal pedestal cabinet, hand holes or as noted on the plans shall be by City of Milwaukee electricians.

Metal pedestal cabinet and handhole splices should be completed using a multi-tap connector. The connector should be rated for 600 volts, conductor range #1/0 through #14 AL-CU, have an insulating cover rated at 105 degrees Celsius, and meet or exceed ANSI 119.4 Class A specifications for reliability.

In Service Distribution Systems
Do not make splices to any underground connections or to any existing distribution system. As indicated on plans, underground splices and connections to existing underground circuitry will be completed by city electricians.

Testing
After the city makes preliminary acceptance of the street lighting system, it shall be monitored by the City of Milwaukee, Street Lighting Electrical Services during a 30 calendar day operational "burn in". Final acceptance of the lighting system will be based on its meeting standard operational criteria as stated in these specifications. The contractor shall be responsible for all necessary repairs and adjustments to the lighting system to meet standard operational criteria.

D Measurement
The department will measure Cable Splice at Handhold or Light Pole Pedestal 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.0060.3002	Cable Splice at Handhole or Light Pole Pedestal	Each

Payment is full compensation for providing cable splices at handholes or light poles.

119. Removing Distribution Centers for Stockpile, Item SPV.0060.3003.

A Description
The work under this item consists of Removing Distribution Centers for Stockpile including electric service pedestal at locations shown in the plans, removing the meter pedestals and disposing of off the site.

B (Vacant)

C Construction
Existing distribution centers shall not be removed until they have been identified by the engineer. Completely remove the distribution cabinet and its base from the surrounding soil and properly dispose of off the job site.

Return the removed lighting distribution center to the department or dispose of off-site as directed by the engineer. Notify Eric Perea, (262) 574-5422, the department's Lighting engineer, before disposal.

Coordinate with the utility for disconnection of service. The department will pay any fees charged by the utility for disconnection of service.

Remove any fencing that is specific to the removed distribution center, incidental to this pay item.

D Measurement
The department will measure Removing Distribution Centers for Stockpile by each removed 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.0060.3003	Removing Distribution Centers for Stockpile	Each

Payment is full compensation for removal of the cabinet and service; and for delivery of the cabinet to the department or disposal.

120. Removing Underdeck Lighting, Item SPV.0060.3004.

A Description
This special provision describes the removing underdeck lighting (luminaires, attached conduits, wires, attached junction boxes, and associated hardware and appurtenances) at locations described. Removed materials shall become the property of the contractor and shall be disposed of off the project site. Lamp disposal shall be paid separately.

B Construction
No removal work will be permitted without approval from the engineer. Removal shall start as soon as the temporary lighting or permanent lighting, as applicable, is placed in approved operation. An inspection and approval by the engineer will take place before any associated proposed permanent or temporary lighting is approved for operation.

Remove all materials as described on the plans and as directed by the engineer. The disposal of removed item shall be done according to pertinent requirements of standard spec 203.3.4.

All embedded conduits, junction boxes and hardware shall be either removed as part of structure or remain in place. Associated items included for each underdeck lighting system may vary by locations as shown on the plans.

C Measurement
The department will measure Removing Underdeck Lighting by each removed unit per location, acceptably completed.

D Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.3004	Removing Underdeck Lighting	Each

Payment is full compensation for removing and disposing of luminaires, attached conduits, attached junction boxes, and hardware.

121. Removing and Relocating Existing High Mast Tower, Item SPV.0060.3005.

A Description
This special provision describes the removing lighting units (tower, ring and associated hardware and appurtenances), storing and re-installing. Separate payment will be made for lamp disposal and for removing concrete foundation and installing new LED luminaires. The existing 1000W HPS luminaires shall be returned to the department.

B (Vacant)

C Construction
Remove high mast lighting towers including high mast shaft, luminaires, tenons, and lowering rings. Deliver the luminaire to the department at the address specified in the special provision Freeway Lighting System – WisDOT owned and included herein, as directed by the engineer.

No removal work will be permitted without approval from the engineer. Removal shall start as soon as the temporary lighting or permanent lighting, as applicable, is placed in approved operation. An inspection and approval by the engineer shall take place before any associated proposed permanent or temporary lighting is approved for operation.

All materials shall be removed as described in this specification and as directed by the engineer. Any high mast tower unit damaged while removing, handling, storing, and re-installing shall be replaced or fixed by the contractor at no additional cost to the department.

Re-installation of the high mast tower shall be done according to pertinent requirements of standard spec 660.

D Measurement
The department will measure Removing and Relocating Existing High Mast Tower by each 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.0060.3005	Removing and Relocating Existing High Mast Tower	Each

Payment is full compensation for removing the high mast lighting towers and re-installing at new location; and for providing all materials including grounding lugs, mounting hardware, required wiring, and connections to complete the work.

122. Removing Concrete Foundation High Mast Tower, Item SPV.0060.3006.

A Description
The work under this item consists of removing high mast tower concrete foundations.

B (Vacant)

C Construction
Remove concrete foundations up to at least 2 feet below subgrade according to standard spec 204.3.2.1 (1). Dispose of removed material according to standard spec 203.3.4. However, the removal shall extend deeper than 2 feet below subgrade if required to facilitate roadway construction at no additional cost to the department. Separate underground conduits and cables from the foundation at 2.5 feet below grade and abandon or re-use as indicated in the plans. Coordinate with the engineer about the construction around each high mast tower concrete foundation.

D Measurement
The department will measure Removing Concrete Foundation High Mast Tower by each 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.0060.3006	Removing Concrete Foundation High Mast Tower	Each

Payment is full compensation according to standard spec 204.5.1 (2).

123. Junction Boxes 18X12X6-Inch Stainless Steel, Item SPV.0060.3007; 6X6X4-Inch Stainless Steel, Item SPV.0060.3008; 4X4X2-Inch Stainless Steel, Item SPV.0060.3009.

A Description

Furnish and install stainless steel junction boxes as shown on the plans, and as hereinafter provided.

B Materials

Furnish material that is according to the pertinent requirements of standard spec 653.2.

Mount junction boxes on the surface of a structure. Furnish the junction box with a cover, gasket, and hardware. Hardware furnished for the cover shall be stainless steel.

Provide a grounding lug in every junction box. A stainless steel conduit fitting shall be used to connect metal conduit to a stainless steel junction box. Box covers shall have a continuous formed, seamless, urethane, oil-resistant gasket. The gasket shall be placed directly onto the junction box cover. The gasket shall adhere to the cover without the use of adhesives. Junction box covers shall be attached to the box with un-slotted hex head screws unless otherwise specified. For boxes mounted on bridge structures, the cover shall be furnished with a retaining chain and captive screws.

The box shall be made of Type 304 stainless steel, not less than gauge 14, with all seams continuously welded with stainless steel weld wire and ground smooth. Exterior surfaces shall have a smooth polished finish. The box shall be according to NEMA Type 4X and be UL 50 "Junction and Pull Box", "Junction Box", or "Pull Box". When specified for attachment to a structure, the box shall be suitable for surface mounting, complete with external stainless steel mounting lugs or brackets welded to the box. The box shall have an overlapping stainless steel cover that is secured to the box with a continuous stainless steel hinge and a minimum of four captive stainless steel clamps utilizing captive stainless steel hex-head bolts or deep slotted stainless steel screws.

C Construction

Install junction boxes as shown on the plans, as directed by the engineer, and according to pertinent requirements of standard spec 653.3.

The junction boxes on structures shall be installed on 1/2-Inch long stainless steel spacers with the hinge on the side of the box. The exact orientation shall be as shown on the plans or as directed by the engineer. Care shall be taken to assure proper orientation of mounting lugs.

D Measurement
The department will measure Junction Boxes (Size) Stainless Steel by each unit installed, 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.0060.3007	Junction Boxes 18X12X6-Inch Stainless Steel	Each
SPV.0060.3008	Junction Boxes 6X6X4-Inch Stainless Steel	Each
SPV.0060.3009	Junction Boxes 4X4X2-Inch Stainless Steel	Each

Payment is full compensation for furnishing and installing junction boxes stainless steel and providing all materials including grounding lugs and stainless steel mounting hardware, and any required wiring to complete the work.

124. Luminaires High Mast Towers LED, Item SPV.0060.3010.

A Description
This special provision describes furnishing and installing Luminaires High Mast Tower LED equipped with roadway lighting remote control and monitoring equipment.

B Materials
Furnish Luminaires, high mast tower, LED meeting or exceeding performance requirements specified in herewith. Luminaires shall conform to applicable portions of standard spec 659.2.2, amendments mentioned in Freeway Lighting Systems special provisions and the WisDOT Specifications for LED Roadway Luminaires. The luminaire housing shall be low copper content aluminum with factory finished durable corrosion and UV resistant gray electrostatically applied thermoset powder-coat which shall be tested according to ANSI B117. Housing access shall be tool-free. The luminaire/ring mounting configuration shall fit the specified high mast tower ring fitter being used per the plan. The luminaire shall be UL listed, IP 66 rated and RoHS compliant for lead and mercury standards.

Furnish quick disconnect connectors for ease of installation and maintenance. The luminaire shall be equipped with 10K surge protection device. Surge protection shall be tested according to ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 scenario 1 category C high exposure 10KV/10KA waveforms.

LED lamps shall be in the 4000K color temperature range with a minimum of 70 CRI. Luminaire shall utilize high brightness LED. The lumen depreciation at 50,000 hours shall not be exceeding 10% of initial. Luminaire shall provide NEMA decal stating

"LED-Wattage-Distribution Type". There shall be a sticker placed on the bottom of the luminaire to clearly identify the WisDOT Luminaire type and size. The sticker shall be visible from a person standing on the ground and is incidental to the luminaire.

The luminaire shall be equipped with a voltage-sensing LED driver, to accommodate 120-277V with 90% power factor and THD 20% max at full load. Surge protection shall be provided and tested according to the specifications. The luminaire shall also be equipped with a quick-disconnect plug for connecting the pole riser wires to the terminal block. A strain relief shall retain the pole riser wires within the luminaire. LED driver shall be a Zitanium Continuous Lumen Output (CLO) driver. Each luminaire shall be furnished with an ANSI C136.10 compliant, locking type, photo control receptacle. A rain tight shorting cap shall be provided and installed.

The acceptable luminaire wattage shall not be more than 560 Watts.

Furnish shop drawings as specified in standard spec 506.3.2, except submit five copies with the materials list. Ensure the drawings contain sufficient details including but limited to luminaire catalog cuts, Two references from government or semi-government agencies currently using the same luminaires, dimming features, luminaire IES distribution, LED driver catalog, Surge Protector catalog, isofootcandle chart with maximum candela point and half candela trace isocandela diagram, number of LEDs, Initial lumens, Lumen depreciation at 50,000 hours, L70 hours, System Wattage at 240V, and IES files on disc to allow satisfactory review and show the dimensions of all equipment shown in the plans.

Do not order materials until the engineer approves.

C Construction

Under the bid item Luminaires Utility LED B, furnish and install luminaires and all necessary miscellaneous accessories and hardware to complete the installation of the luminaires.

Follow manufacturer's instructions regarding luminaire installation.

Use three single-conductor No. 12 stranded wires to connect the luminaires to their respective branch conductors in the pole base or in the adjacent junction box. Each luminaire feeder wire shall be protected by one 5-amp KTK fuse. Fuses and fuse holders shall be as per the details in the Plan. The wires shall be paid separately.

All exposed threaded equipment mounting hardware shall be stainless steel. The contractor shall coat all threaded stainless steel hardware and dissimilar metal, threaded hardware with an approved zinc-based anti-seize compound (Loctite, Jet-Lube or approved equal) prior to assembly.

The vibration testing, warranty, and submittals shall be done for high mast tower LED luminaries according to the requirements mentioned in Freeway Lighting System special provision. The independent testing shall be performed according to the requirements

mentioned in Freeway Lighting System special provision for high mast tower LED luminaire even for less than 30 luminaires of the same type.

The contractor is responsible to deliver spare luminaires after all the testing as approved by the engineer at one of the department's facilities as directed by the engineer.

D Measurement
The department will measure Luminaires High Mast Towers LED as each individual lighting 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.0060.3010	Luminaires High Mast Towers LED	Each

Payment is full compensation for furnishing and installing all materials, including luminaire, remote control monitoring node, dimming device, delivering spare luminaire, accessories, hardware and fittings necessary to install the luminaire fully operational.

125. Underdeck Luminaire Mounting Assembly, Item SPV.0060.3011.

A Description
This special provision describes furnishing and installing luminaire mounting assembly attached to the steel girders at locations shown on the plans and as directed by the engineer.

B Materials
The mounting assembly shall be made out of struts and brackets as shown on the plans. Struts and brackets shall be manufactured by UNISTRUT Corporation or approved equal.

All the hardware and material shall be stainless steel unless noted otherwise on the plans.

C Construction
Install the mounting assembly as shown the plans and as directed by the engineer. The contractor shall avoid contact of dissimilar metal using washers made from a rugged elastomeric material or neoprene with a minimum thickness of 1/2 inch (13 mm) or as recommended by the manufacturer.

The complete assembly shall be capable of handling luminaire and mounting plate weight meeting loading requirements of AASHTO for 90mph wind with 1.3 wind gust factor.

D Measurement
The department will measure Underdeck Luminaire Mounting Assembly by each unit 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.0060.3011	Underdeck Luminaire Mounting Assembly	Each

Payment is full compensation for providing underdeck luminaire mounting assemblies.

126. Temporary Wood Pole, Item SPV.0060.3012.

A Description

The work under this item includes furnishing and installing wood poles, brackets, conduits, hardware, wires, grounding system, and lightning protection system, as shown on the plans and as hereinafter provided. Removal and disposal of temporary wood poles are part of this item.

B Materials

Furnish wood poles, Class 4 or larger. The poles shall be western red cedar according 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. The length of the pole may vary by location; contractor shall determine the wood pole length to provide 40ft mounting height from luminaire to adjacent roadway surface and necessary embedment as shown on plans.

Furnish conduits and wires according to the pertinent requirements of standard spec 652.2, 655.2.6, 659.2.

The contractor may be permitted, upon the approval from the engineer to use previously used materials complying with specifications.

C Construction

This work shall be done according to the pertinent provisions of standard spec 611.3.1.1 and as shown on the plans. Install cable guard and provide fuses as shown on the plans.

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 the conduit, conduit bodies, and wires according to standard spec 652.3, 655.3, and 659.3.

Remove temporary wood poles as shown on temporary lighting plans or as directed by the engineer. Removed temporary wood poles will become property of contractor. The bid price shall reflect the salvage value of the temporary wood pole. The department will allow the contractor to reuse removed temporary wood pole at a new location, if deemed acceptable by the engineer.

D Measurement

The department will measure Temporary Wood Pole by each unit installed, 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.0060.3012	Temporary Wood Pole	Each

Payment is full compensation for furnishing and installing items as mentioned above; for furnsihing all excavation and backfill; and for removal and disposal.

127. Street Lighting Polymer Concrete Vault 13-Inch X 24-Inch x 18-Inch, Item SPV.0600.3013; 17-Inch X 30-Inch x 18-Inch, Item SPV.0600.3014.

A Description

This special provision describes furnishing and installing Polymer Concrete Vaults according to current City of Milwaukee methods.

B Materials

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.

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 x 10^6 PSI tested according to procedures outlined in ASTM D-695

Comprehensive Strength (fiberglass reinforced polymer): 24,300 PSI tested according to ASTM D-695

Flexural Strength (fiberglass reinforced polymer): 18,700 PSI tested according to ASTM D-790

Tensile Strength (fiberglass reinforced polymer): 12,100 PSI tested according to procedures outlined in ASTM D-638

Tensile Modulus of Elasticity (fiberglass reinforced polymer): 8.6 x 10^5 PSI tested according to procedures outlined in ASTM D-638

Splitting Tensile Strength (polymer concrete): Tested according to procedures outlined in ASTM C-496

Accelerated Service: Tested according to procedure E outlined in ASTM D-756

Water Absorption: Tested according to ASTM D-570 outlined in sections 6.1 and 6.5

Impact Resistance (fiberglass reinforced polymer concrete): 72 foot pounds according to ASTM D-2444 administered with a "C" tup

Skid Resistance: 0.60 coefficient of friction according to ASTM C-1028

Flammability Test: Tested according to ASTM D-635

Ultraviolet Exposure: Tested according 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 two stainless steel bolts. 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.

C Construction

Install rectangular flared wall vaults according to current City of Milwaukee standards. Vault shall be at minimum 4 feet away from any proposed or existing street light pole. Provisions for inserting conduit into any side or the bottom of the vault shall be included.

D Measurement

The department will measure Street Lighting Polymer Concrete Vault (Size) 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.0060.3013	Street Lighting Polymer Concrete Vault 13-Inch x 24-Inch x 18-Inch	Each
SPV.0060.3014	Street Lighting Polymer Concrete Vault 17-Inch x 30-Inch x 18-Inch	Each

Payment is full compensation for providing street lighting vaults.

128. Pedestal Housing 6-Inch x 6-Inch x 36-Inch, Item SPV.0060.3015.

A Description

The special provision describes providing pedestal housing. The pedestal housing is a metal cabinet housing that is 6" x 6" x 36" and is for secondary cable slices.

B Materials

The housing shall be constructed of 14 Gauge G90 Galvanized steel.

The housing shall be painted inside and out with white enamel.

The housing shall be according to Drawing Number B-04-07 (except for size 6" X 6" X 36") of the typical details in the plan set.

C Construction

Locate the metal housing 180 degrees from hand hole on pole. Attach the metal housing by using 3/4 inch by 0.20 inch stainless steel banding. After all splices have been completed, and have been approved by the engineer, close and seal the housing with a Fargo model GM #320 locking device or approved equal.

Make all splices in metal housings in approved manner as illustrated on the plans.

D Measurement

The department will measure Pedestal Housing 6-Inch x 6-Inch x 36-Inch 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.0060.3015	Pedestal Housing 6-Inch x 6-Inch x 36-Inch	Each

Payment is full compensation for providing pedestal housing.

129. Luminaires City of Milwaukee LED Street Light 180W, Item SPV.0060.3016; 105W, Item SPV.0060.3017; 40W, Item SPV.0060.3018.

A Description

The work under this item is for furnishing and installation of LED street light luminaires ass shown in plans and according to the following:

B Materials

Philips RoadStar LED fixture:

180W98LED4K-LE3-240-BL
105W79LED4K-LE3-240-BL
40W49LED4K-LE2-240-BL

TECHNICAL SPECIFICATIONS: All features below shall be incorporated into the equipment and all items shall be furnished and installed into a complete unit ready for operation.

TYPE: The LED luminaires purchased under this contract will be of Philips RoadStar series with the above order number. The luminaires shall be designed so it can efficiently produce uniform illumination according to I.E.S. Type II or Type III light distribution according to the lighting plan.

HOUSINGS: The entire housings shall be rugged, high quality, cast aluminum for maximum strength, durability and lasting beauty. All castings shall be free from pits, blowholes, or other irregularities. All edges are to be free from sharp burrs.

Upper Housing: The upper housing shall have an integral leveling pad or other suitable means for quick, easy and proper positioning of the luminaire.

Lower Housing: The lower housing or housings shall be hinged and easily opened for routine maintenance. All component parts shall be easily accessible with the lower housing opened.

Hinges: Hinges shall be so constructed and designed to accurately position the lower housings and assure a positive locking with the upper housing. The hinges shall be provided with a safety catch to prevent the accidental disengagement of the lower housing during servicing.

Finish: The entire unit, upper and lower housings, shall have a smooth finish that will maintain a fine appearance and will resist damage by weathering.

Color The luminaire shall be of white.

OPTICAL ASSEMBLY: The RoadStar optical assembly shall be IP66 rated sealed and ANSI 3G rated vibration resistant for reliable lighting solution.

OPTICAL SYSTEM: The RoadStar fixture shall be ordered with Type II light distribution (LE2) refractor or Type III light distribution (LE3) refractor according to the lighting plan.

VOLTAGE AND FREQUENCY: The RoadStar fixture shall be designed for operation at 240 Volt, 60 Hertz without photoelectric cell receptacle.

HEAT MANAGEMENT: Heat is managed through built-in external heat-sink on the fixture plus utilizing aluminum MCPCB printed circuit board.

MOUNTING: The luminaire shall have an adjustable 2" slip fitter and integral pipe stop to permit entry of at least 5-1/2 inches of the bracket for secure mounting.

HARDWARE: All nuts, bolts, latches, etc. furnished with the luminaire shall be fabricated from stainless steel or other non-ferrous materials.

LIFESPAN: The RoadStar fixture shall meet or exceed L_{70} of 70,000 hours under TM 21.

MANUFACTURER'S WARRANTY:
The manufacturer shall warranty that the each component installed as part of this pay item including but not limited to capacitor, driver, terminal block, inbuilt SPD, LEDs, terminal board and wiring shall be free from defects in material and workmanship for five years from the date of final punch list completion and acceptance of the complete system. Any extended warranty coverage required to comply with the specified warranty period shall be provided as a part of this pay item.

Defective equipment shall be repaired or replaced with an identical one in mounting, output characteristics, electrical and control operation, at the manufacturer's option, during the warranty period at no cost. For purposes of clarity, "repair or replace the product or the defective part thereof" does not include any reinstallation costs, including without limitation labor costs or expenses. The manufacturer shall pay inbound and outbound shipping charges during the warranty period for products returned as warranty claims. The manufacturer shall also provide an advance exchange program for warranty claims. If the manufacturer chooses to replace the product and is not able to do so because it has been discontinued or is not available, the manufacturer may replace it with a comparable product. The manufacturers shall provide product return policy. Manufacturers will not be responsible for damage to any product resulting from misuse, negligence, acts of God other than normal environmental effects of wind, rain and ice, or accident or resulting from repairs or alterations made by any person or firm not duly authorized by manufacturer in writing.

C Construction
Install Philips Roadstar fixture on the six foot mounting bracket on the pole according to current City of Milwaukee standards. Per City of Milwaukee standards, include provisions for inserting 2#12UF cable between the fixture and cable connecting point at either the pedestal or handhole.

Deliver spare luminaires to City of Milwaukee's Street Lighting Department. The spare luminaire shall be brand new in working condition. Demonstrate the fully functional spare luminaires upon delivery to City of Milwaukee. Coordinate with Michael Guerrero at (414) 286-5947 for delivery information and demonstration.

D Measurement
The department will measure Luminaires City of Milwaukee LED Street Light (Watt) 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.0060.3016	Luminaires City of Milwaukee LED Street Light 180W	Each
SPV.0060.3017	Luminaires City of Milwaukee LED Street Light 105W	Each
SPV.0060.3018	Luminaires City of Milwaukee LED Street Light 40W	Each

Payment is full compensation for providing LED street light luminaries.

130. Luminaires City of Milwaukee Underdeck Walkpack LED 72W, Item SPV.0060.3019.

A Description
The work under this item is for furnishing and installation of LED luminaires as shown in plans and according to the following:

B Materials
Holophane LED wallpack W4G-20C-1000-40k-T3M-MVOLT-SC-DF-TP-WH.

TECHNICAL SPECIFICATIONS: All features below shall be incorporated into the equipment and all items shall be furnished and installed into a complete unit ready for operation.

TYPE: The LED Wallpack purchased under this contract will be of Holophane LED Wallpack series with the above order number. The luminaires shall be designed so it can efficiently produce uniform illumination according to I.E.S. Type III light distribution according to the lighting plan.

HOUSINGS: The entire housings shall be rugged, high quality, cast aluminum for maximum strength, durability and lasting beauty. All castings shall be free from pits, blowholes, or other irregularities. The housing shall be completed sealed to keep out of moisture dust and insects to assure maintained light output with minimum servicing. All edges are to be free from sharp burrs. The color of the housing shall be of white.

Refractor: It shall have an accurate system of sharp, well defined, light controlling prisms to provide the IES Type III distribution.

Material: The refractor shall be molded of Boro-Silicate glass for maximum resistance to impact and thermal shock

VOLTAGE AND FREQUENCY: The LED Wallpack shall be designed for operation at 240 Volt, 60 Hertz without photoelectric cell receptacle.

HEAT MANAGEMENT: Heat is managed through integral aluminum heat-sink on the fixture plus utilizing metal core circuit board.

HARDWARE: All nuts, bolts, latches etc. furnished with the luminaire installation shall be fabricated from stainless steel or other non-ferrous materials.
LIFESPAN: The LED Wallpack shall meet or exceed L_{70} of 70,000 hours under TM-21.

MANUFACTURER'S WARRANTY:
The manufacturer shall warranty that the each component installed as part of this pay item including but not limited to capacitor, driver, terminal block, inbuilt SPD, LEDs, terminal board and wiring shall be free from defects in material and workmanship for five years from the date of Final Punch List Completion and Acceptance of the complete system. Any extended warranty coverage required to comply with the specified warranty period shall be provided as a part of this pay item.

Defective equipment shall be repaired or replaced with an identical one in mounting, output characteristics, electrical and control operation, at the manufacturer's option, during the warranty period at no cost. For purposes of clarity, "repair or replace the product or the defective part thereof" does not include any reinstallation costs, including without limitation labor costs or expenses. The manufacturer shall pay inbound and outbound shipping charges during the warranty period for products returned as warranty claims. The manufacturer shall also provide an advance exchange program for warranty claims. If the Manufacturer chooses to replace the product and is not able to do so because it has been discontinued or is not available, the manufacturer may replace it with a comparable product. The manufacturers shall provide product return policy. Manufacturers will not be responsible for damage to any product resulting from misuse, negligence, acts of God other than normal environmental effects of wind, rain and ice, or accident or resulting from repairs or alterations made by any person or firm not duly authorized by manufacturer in writing.

C Construction
Install Holophane LED wallpack at locations per plan standards and specifications.

Deliver spare luminaires to City of Milwaukee's Street lighting Department. The spare luminaire shall be brand new in working condition. Demonstrate the fully functional spare luminaires upon delivery to City of Milwaukee. Coordinate with Michael Guerrero at (414) 286-5947 for delivery information and demonstration.

D Measurement
The department will measure Luminaires City of Milwaukee Underdeck Path Lighting 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.0060.3019	Luminaires City of Milwaukee Underdeck Walkpack LED 72W	Each

Payment is full compensation for providing LED.

131. Luminaires City of Milwaukee Underdeck Path Lighting LED 47W, Item SPV.0060.3020.

A Description
The work under this item is for furnishing and installation of LED luminaires as shown in plans and according to the following:

B Materials
Kenall TEKDEK TD17HO QM 5S TP MW 47L 40K7 DCC DV BG DS.

TECHNICAL SPECIFICATIONS: All features below shall be incorporated into the equipment and all items shall be furnished and installed into a complete unit ready for operation.

TYPE: The ceiling mount17" high output LED luminaire for parking garage under this contract will be of Kenall Parking Structures series with the above order number. The luminaires shall be designed so it can efficiently produce uniform illumination according to I.E.S. Type V light distribution according to the lighting plan.

HOUSINGS: The entire housings shall be rugged, high quality, cast aluminum for maximum strength, durability and lasting beauty. All castings shall be free from pits, blowholes, or other irregularities. The housing shall be completed sealed to keep out of moisture dust and insects to assure maintained light output with minimum servicing. All edges are to be free from sharp burrs. The color of the housing shall be of white.

Refractor: It shall have an accurate system of sharp, well defined, light controlling prisms to provide the IES Type V distribution.

Material: The refractor shall be molded of UV-stabilized, high-impact resistant polycarbonate for maximum resistance to impact and thermal shock

VOLTAGE AND FREQUENCY: The Ceiling Mount 17" High Output LED Luminaire For Parking Garage shall be designed for operation at 240 Volt, 60 Hertz without photoelectric cell receptacle.

HEAT MANAGEMENT: Heat shall be managed without compromising the fixture integrity and durability.

HARDWARE: All nuts, bolts, latches etc. furnished with the luminaire installation shall be fabricated from stainless steel or other non-ferrous materials.

LIFESPAN: The Ceiling Mount 17" High Output LED Luminaire For Parking Garage shall meet or exceed L_{70} of 175,000 hours under TM-21.

MANUFACTURER'S WARRANTY:
The manufacturer shall warranty that the each component installed as part of this pay item including but not limited to capacitor, driver, terminal block, inbuilt SPD, LEDs, terminal board and wiring shall be free from defects in material and workmanship for ten years from the date of Final Punch List Completion and Acceptance of the complete system. Any extended warranty coverage required to comply with the specified warranty period shall be provided as a part of this pay item.

Defective equipment shall be repaired or replaced with an identical one in mounting, output characteristics, electrical and control operation, at the manufacturer's option, during the warranty period at no cost. For purposes of clarity, "repair or replace the product or the defective part thereof" does not include any reinstallation costs, including without limitation labor costs or expenses. The manufacturer shall pay inbound and outbound shipping charges during the warranty period for products returned as warranty claims. The manufacturer shall also provide an advance exchange program for warranty claims. If the manufacturer chooses to replace the product and is not able to do so because it has been discontinued or is not available, the manufacturer may replace it with a comparable product. The manufacturers shall provide product return policy. Manufacturers will not be responsible for damage to any product resulting from misuse, negligence, acts of God other than normal environmental effects of wind, rain and ice, or accident or resulting from repairs or alterations made by any person or firm not duly authorized by manufacturer in writing.

C Construction
Install Ceiling Mount 17" High Output LED Luminaire For Parking Garage at location per plan standards and specifications.

Deliver spare luminaires to City of Milwaukee's Street lighting Department. The spare luminaire shall be brand new in working condition. Demonstrate the fully functional spare luminaires upon delivery to City of Milwaukee. Coordinate with Michael Guerrero at (414) 286-5947 for delivery information and demonstration.

D Measurement
The department will measure Luminaires City of Milwaukee Underdeck Path Lighting LED 47W 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.0060.3020	Luminaires City of Milwaukee Underdeck Path Lighting LED 47W	Each

Payment is full compensation for provding LED luminaires.

132. Light Pole City of Milwaukee White Square Tapered Concrete 36FT, Item SPV.0060.3021; 31FT, Item SPV.0060.3022; 26FT, Item SPV.0060.3023.

A Description
The work under this item is for furnishing and installation of tapered concrete light poles as shown in plans and according to the following:

B Materials
General: The various designs of concrete poles to be furnished are shown on the prints of drawings that form a part of this specification and are attached hereto. The dimensions given are not intended to be exact or precision measurements. Slight variations in dimensions and design that are immaterial to strength and appearance will be permitted, but all such variations shall be approved by the Street Lighting Division.

Manufacturer	Catalog Number
StressCrete	E-360-BPT-G-S35-COM
StressCrete	E-310-BPT-G-S35-COM
StressCrete	E-260-BPT-G-S35-COM

DESCRIPTION: The pole shall be concrete, one-piece with dimensions, taper and cross section as shown in the drawings. The butt section shall be square in shape or as indicated in the drawings. The pole shall be manufactured as a prestressed and reinforced centrifugally spun pole as set forth in A.S.T.M. C1089-88 unless otherwise directed.

MATERIALS:
Concrete Aggregates: Concrete aggregates shall meet all the requirements of A.S.T.M. C33. All aggregate employed in the manufacture of the concrete poles shall be white crystalline stone. The texture and color of the aggregates shall be approved by Street Lighting Division.

The aggregates shall be of adequate strength in resisting crushing stresses and impervious to moisture; of such character as not to deteriorate or change as a result of continued exposure for years to the weather; and of such character that it crushes into masses approximately cubical in form, not in flakes. Aggregates shall all pass a 3/8 inch sieve, with a minimum size passing a #100 sieve.

Cement: The cement shall be fresh and free from lumps and shall conform to specifications of the American Society of Testing Materials, serial designation C-150, Type I or Type III.

Water: The water employed shall be free from acids, alkalis, oil, or organic matter.

Materials Proportion: The materials combined to produce the concrete shall be proportioned by weight.

Steel: The surface of all steel shall be free from dirt, oil, or grease. The steel used as either reinforcing or prestressing shall be adequately sized to meet the strength requirements of the finished poles, as herein specified. Longitudinal reinforcement, prestressing and spiral wrap shall comply with the latest version of the applicable ASTM standards. All prestressed wire shall be stressed to not less than 60% or more than 70% of its tensile strength.

Test of Materials: Any and all of the above materials shall be subject to test at any time before use, as may be directed, and samples for this purpose shall be furnished by the contractor upon request.

POLE STRENGTH: All poles furnished shall withstand a 90 mph wind load plus 3S gust factor and a 400 lbs working load.
The pole design shall allow for a maximum load of not less than twice the working load.

The elastic limit at which any pole will actually fail to withstand any additional stress without permanent injury shall not be less than 2-1/2 times the working load.

LOADING AND STABILITY: All the StressCrete poles furnished under this specification shall support two bracket mounted 36 inch, 40 pound arms each with an one hundred pound fixture of an EPA of 5. All pole designs shall meet the latest revision of the AASHTO specifications for these poles as defined in their Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals handbook.

Within 30 days of contract execution, submit the light pole manufacturer's engineering calculations showing that maximum stress and deflections do not exceed specified performance requirements under full design loading, as well as other certified reports and data which indicate that the light poles meet or exceed all loading requirements. The light pole drawings and calculations must be signed and sealed by a registered professional engineer in either Wisconsin or the state in which the structures are to be fabricated.

The entire horizontal and vertical "wind sail" area of the pole assembly subject to wind load including arm and luminaire shall be designed to withstand the AASHTO standard specifications, from above, for wind load requirements for a 90 MPH wind load with gust factor computed per section 3.8.5.and height and exposure factors from table

CABLE RACEWAY: Each concrete pole shall have a hollow raceway at least one and one-half inches in diameter and continuous in a straight line, without appreciable offset, throughout its entire length.

The raceway shall be free from sharp projections or edges that might injure the insulated wire or cable sheath.

Dimensions and locations for lateral opening in the raceway are shown on the drawings.

All poles shall be furnished with hand hole. The hand hole shall be located on the face 90 degrees from the lateral opening in the butt of pole and shall have the minimum dimensions of 2-1/2" x 8". The cover shall be heat-treated cast aluminum, or other material as approved by the city, fastened to non-ferrous insert in the pole. The cover shall be secured to the pole using 1/4"-20 NC by 3/4" long 18-8 stainless button head Torx T27H tamper proof screws.

Two lateral openings into the raceway, of dimensions and locations as shown on the drawings, shall be provided in the butt of the pole.

CONCRETE:
Strength: The concrete strength shall meet the following requirements when tested according to A.S.T.M. C39.

Release of Prestressing Steel: Concrete cylinders made according to A.S.T.M. C31 shall attain a minimum strength of 3,500 p.s.i. at the time that prestressing is released.

Twenty-Eight Days: Concrete cylinders made according to A.S.T.M. C31 shall attain a minimum strength of 8,000 p.s.i. at 28 days.

Admixture: All poles shall be manufactured with quality HSF (high silica fume) cement to reduce porosity in the concrete and increase compressive strength.

The city may sample and test the concrete at any time. Concrete samples made according to A.S.T.M. C31 shall be furnished by the contractor upon request of the city.

Process and Surface Finish: The finished concrete used in the manufacture of poles shall be a very dense product, free from undesirable air pockets or voids.

The concrete shall be compacted by the centrifugal process so that the surface is dense, with the coarse and fine aggregate evenly distributed. If requested to do so by the Purchasing Division – DOA or the City of Milwaukee Lighting Engineer, a sample shall

be produced that is representative of the pole cross-section and at least three inches in length. The sample shall be submitted to the city for approval with respect to color, texture and finish. The concrete mix from which the sample was made shall be noted and submitted with the sample. A representative sample of all aggregates used also shall be submitted.

The mixture of aggregates shall be essentially uniform over the entire exterior surface of concrete poles furnished.

Size of the duct shall be controlled so that the prestressed and/or reinforcing rods are not embedded in "slurry" (i.e., water-cement-sand mix that collects in the pole core during the spinning process).

Following the casting operation, the pole shall be cured with low-pressure steam for as long as needed to reach the necessary strength to allow handling and release of prestressing wires. Poles shall remain in storage for as long as needed for the concrete to reach the required compressive strength. Poles shall meet the design strength before shipment is allowed.

To assure that poles are not prematurely exposed to freeze-thaw action and deicer, adequate curing of the concrete for development of sufficient strength to resist scaling and for reduction of water content of the concrete shall be the responsibility of the manufacturer.

The finished surface must be polished so that the color and surface smoothness are uniform over the entire surface. The face surface shall be sealed with a siloxane penetrating sealer and a high molecular weight acrylic copolymer or other sealing compounds that will yield equivalent degree of protection from water, salt, and/or other chemical infiltration and does not discolor or fade.

The entire lot of concrete poles to be furnished under this specification shall be uniformly consistent in color and finish.

Treatment with diluted acid to obtain the desired finish is not permitted.

The finished surface of all poles shall be free from visible pits, fins, grooves, patches, or other surface markings not specifically enumerated herein.

The top of the pole shall be flat and perpendicular to the longitudinal axis of the pole so that the pole cap will have a positive seat.

Chloride accelerators shall not be used in the manufacturing process.

REINFORCEMENT: The reinforcing cage, spiral reinforcement and prestressing steel shall be placed in position and maintained in place during the centrifugal manufacturing process. The longitudinal reinforcement, prestressing and spiral reinforcement shall continue throughout the entire length of the pole.

COVER: All steel shall be covered at all points by at least 1/2 inch of concrete, except where it may be necessary in the process of manufacture to have the rods and/or wire extend beyond the ends of the poles. In such case, the rods and/or wires shall be cut off afterward, even with the face of the molded product, unless otherwise noted on the drawings included herein.

Where the above minimum coverage cannot be maintained next to cable entrance, wire outlet, etc., the reinforcing shall be protected with a suitable sleeve.

Drawings of the reinforcing cage, spiral reinforcement and prestress steel that the manufacturer proposes to use in the manufacture of concrete poles, showing the size, shape and arrangement of reinforcing prestressing spiral reinforcement, ties, method of holding cage in place, etc. shall be submitted to Street Lighting Division.

WATERPROOFING: The top and bottom of the poles shall be properly coated with bitumastic waterproofing material.

Waterproofing material shall be of such quality and consistency that it will not crack or chip when subjected to extremely cold weather, and that it will not flow when subjected to extremely hot weather.

ACCESSORIES:
Pole cap: Each pole, when the design calls for a pole cap, shall have a removable aluminum pole cap, firmly and securely fastened in proper position by the contractor.

Miscellaneous: All pipes, bolts, nut wire, washers, pole caps, casting, fittings, and appurtenances of any sort are to be furnished by the contractor and made of approved rust-proof metal of such design, composition, and dimensions as may be approved by the city before the contractor begins manufacture.

MARKING: Every pole shall bear an impressed marking, or other type of marking acceptable to the city, of the type of pole, contractor's insignia, and casting date (month and year). Type of pole and contractor's insignia shall have letters at least 1 inch tall. The casting date shall have digits not less than 1/2 inch tall. All markings shall be located in line with the cable entrance in the butt of the pole and shall be placed 15 inches to 20 inches above the ground line.

COLOR PIGMENTS: Poles with a colored finish shall be furnished where specified. The coloring is to be done by mixing a pigment into the concrete before casting. The color of the pole shall be uniform throughout the body of the pole, shall not fade and shall be maintenance free. The type of coloring pigment shall be indicated with the bid and a

sample which represents the finished colored pole shall be furnished for approval of the Purchasing Division - DOA, if requested.

INSPECTION:
General inspection for acceptance of the concrete poles shall be made upon delivery at job-site in Milwaukee. Decision as to the compliance with the specification and the quality of the poles shall be made by the city.

Tests and inspections for compliance of any of the specified characteristics of the poles also may be made upon the finished product after delivery, at any time before installation.

REJECTION:
Poles failing to meet the requirements of this specification will be rejected by the city, and the contractor shall immediately remove the same, and furnish at their own expense, poles in conformity with this specification. The contractor shall pay all freight charges for all material furnished under this contract and all unloading and handling charges for any material that may be rejected by the city, including freight charges for return or disposal of such rejected material.

The cost of testing poles that are subsequently rejected for non-compliance with the specification shall be charged to the contractor.

PEA GRAVEL
The pea gravel must consist of particles from natural gravel deposits and shall be composed of clean, hard, tough, durable pebbles free from adherent coatings, soft, flat, or elongated particles, and organic or other deteriorative matter. The following limits apply to deteriorative substances in the pea gravel.

Chert	not over 4% by weight
Coal	not over ½% by weight
Clay lump and friable particles	not over ½% by weight
Soft fragments	not over 1% by weight
Any combination of the above	not over 4% by weight
Flat, elongated or laminated pcs.	Not over 10% by weight

(Flat and elongated particles are those having a length more than five (5) times the average thickness)

Grading requirements of the pea gravel are as follows:

Passing 3/8 inch sieve	95% to 100%
Passing No.4 sieve	25% to 50%
Passing No.8 sieve	0% to 5%

Each unit will require approximately 0.25 cubic yard of pea gravel.

C Construction

The direct bury pole is to be set as illustrated in the plans. The excavated holes are to be 14 or 16 inches in diameter and to a depth of 6 feet 6 inches depending on manufacturers' pole butt length. The holes can be bored, hydrovaced, or hand dug but all shall be cylindrical. If any part of the hole is within three feet of a buried utility, the holes must be hand dug or hydrovaced. No other method of setting poles is acceptable. The poles shall be parallel and perpendicular to the horizon once set.

In some cases, the poles are to be installed in areas of concrete walk. Prior to concrete removal, the concrete shall be saw cut to allow adequate room for pole and cable installation. Saw cutting for removal shall be square or rectangular in shape. The contractor shall be responsible for disposing all debris from excavation and removed from site.

There shall be a minimum 6 inch bed of tamped pea gravel for the pole to set on. Backfill around the pole with pea gravel. Tamp pea gravel every 12 inches and fill to within 3 inches of finished grade.

In areas where concrete walk was removed, felt paper is to be installed around the base of pole and 3 inches of concrete installed. Concrete shall be the standard 5 bag mix, and the finished surface should match adjacent grades.

Fill grass areas that were disturbed during construction with 3 inches of topsoil and then sod to match the adjacent finished grade. Stencil addresses to the pole as shown on the plan.

Wire pole as shown on the plans. Two riser cables in pole shall be each 50 feet in length and cut from copper 2#12 UF with ground cable. One wire shall be black, the other shall be white, and the ground can be either bare or green. All splicing is to be done inside the metal housing. The ground wires shall be spliced inside the metal housing and grounded to the housing and each fixture. The cable shall conform to NEC Article 340. The riser cable shall be continuous without splices. The electrical system in use utilizes a full system ground. The neutral is not to be grounded at any point.

Deliver the spare white square light poles to City of Milwaukee's Street lighting Department. The spare light pole shall be brand new without any damage, Any light poles found damaged or not meeting the specification upon the delivery to the City of Milwaukee shall be replaced in kind as directed by the engineer. Coordinate with Michael Guerrero at (414) 286-5947 for delivery information.

D Measurement

The department will measure Light Pole City of Milwaukee White Square Tapered Concrete (Height) 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.0060.3021	Light Pole City of Milwaukee White Square Tapered Concrete 36FT	Each
SPV.0060.3022	Light Pole City of Milwaukee White Square Tapered Concrete 31FT	Each
SPV.0060.3023	Light Pole City of Milwaukee White Square Tapered Concrete 26FT	Each

Payment is full compensation for providing the pole, riser cable or cables, pea gravel, and all connections.

133. White Square Tapered Concrete Pole Mounting Plate Set, Item SPV.0060.3024.

A Description

The work under this item is for furnishing and installation of mounting plate sets for tapered concrete poles as shown in plans and according to the following.

B Materials

StressCrete square pole mounting plate set fabricated for City of Milwaukee per city Spec. and drawing PO1543A-plate.

Mounting plate is either cast aluminum AA#713 or extruded 6061-T6 bar stock.

C Construction

Attach the bracket to the square pole with two ¾ ” x 13 NC x 1 ¾” long stainless steel bolts.

D Measurement

The department will measure White Square Tapered Concrete Pole Mounting Plate Set as each unit, acceptably completed. Two halves of the plate set equals one unit.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.3024	White Square Tapered Concrete Pole Mounting Plate Set	Each

Payment is full compensation for furnishing and installing white square tapered concrete pole mounting plate set and any hardware necessary to complete the work.

134. Decorative Sconce LED Luminaire for Bridge Structure Lighting, Item SPV.0060.3025.

A Description
The work under this item is for furnishing and installation of the decorative LED luminarie sconces as shown in plans and according to the following:

B Materials
Deco D458 led 60 41 UNV WH WSF 240V

TECHNICAL SPECIFICATIONS: All features below shall be incorporated into the equipment and all items shall be furnished and installed into a complete unit ready for operation.

TYPE: The LED sconce light purchased under this contract will be of Deco LED Slim Wall Sconce series with the above order number. The luminaire shall be designed so it can efficiently produce uniform illumination for up and down lighting for outdoor application.

HOUSINGS: The entire housings shall be rugged, high quality, cast aluminum for maximum strength, durability and lasting beauty. All castings shall be free from pits, blowholes, or other irregularities. The housing shall be completed sealed to keep out of moisture dust and insects to assure maintained light output with minimum servicing. All edges are to be free from sharp burrs. The color of the housing shall be of white.

DIFFUSER: The diffuser shall be of tempered glass, no acrylic or polycarbonate diffuser is accepted.

VOLTAGE AND FREQUENCY: The LED sconce light shall be designed for operation at 240 Volt, 60 Hertz without photoelectric cell receptacle.

HEAT MANAGEMENT: Heat is managed through integral aluminum heat-sink on the fixture.

HARDWARE: All nuts, bolts, latches etc. furnished with the luminaire installation shall be fabricated from stainless steel or other non-ferrous materials.

LIFESPAN: The LED Wallpack shall meet or exceed L_{70} of 70,000 hours under TM-21.

MANUFACTURER'S WARRANTY:
The manufacturer shall warranty that the each component installed as part of this pay item including but not limited to capacitor, driver, terminal block, inbuilt SPD, LEDs, terminal board and wiring shall be free from defects in material and workmanship for ten years from the date of final punch list completion and acceptance of the complete system. Any extended warranty coverage required to comply with the specified warranty period shall be provided as a part of this pay item.

Defective equipment shall be repaired or replaced with an identical one in mounting, output characteristics, electrical and control operation, at the manufacturer's option, during the warranty period at no cost. For purposes of clarity, "repair or replace the product or the defective part thereof" does not include any reinstallation costs, including without limitation labor costs or expenses. The manufacturer shall pay inbound and outbound shipping charges during the warranty period for products returned as warranty claims. The manufacturer shall also provide an advance exchange program for warranty claims. If the Manufacturer chooses to replace the product and is not able to do so because it has been discontinued or is not available, the manufacturer may replace it with a comparable product. The manufacturers shall provide product return policy. Manufacturers will not be responsible for damage to any product resulting from misuse, negligence, acts of God other than normal environmental effects of wind, rain and ice, or accident or resulting from repairs or alterations made by any person or firm not duly authorized by manufacturer in writing.

C Construction

Install Decorative Sconce LED Luminaire for Bridge Structure Lighting at locations per plan standards and specifications.

Deliver spare luminaires to City of Milwaukee's Street Lighting Department. The spare luminaire shall be brand new in working condition. Demonstrate the fully functional spare luminaires upon delivery to City of Milwaukee. Coordinate with Michael Guerrero at (414) 286-5947 for delivery information and demonstration.

D Measurement

The department will measure Decorative Sconce LED Luminaire for Bridge Structure Lighting 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.0060.3025	Decorative Sconce LED Luminaire for Bridge Structure Lighting	Each

Payment is full compensation for providing decorative LED luminary sconces.

135. Street Lighting Bracket Arm 2-Inch Dia. 6 FT - Install Only, Item SPV.0060.3026.

A Description

The work under this item includes installation of the street lighting bracket arms furnished by City of Milwaukee as shown in plans and in accordance with the following.

B Materials
The street lighting bracket arm will be furnished by City of Milwaukee. The contractor shall provide any hardware necessary for the installation.

C Construction
Arrange to pick up street lighting bracket arm from City of Milwaukee Street Lighting Department. Coordinate with Michael Guerrero at (414) 286-5947 for pick up information.

The bracket arm shall be attached to the pole with two (2) ½" x 13 NC x 1" long stainless steel bolts.

D Measurement
The department will measure Street Lighting Bracket Arm 2-Inch Dia. 6 FT - Install Only 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.0060.3026	Street Lighting Bracket Arm 2-Inch Dia. 6 FT - Install Only	Each

Payment is full compensation for picking up the street lighting bracket arm from City of Milwaukee; for installation and coordination; and providing any hardware necessary to complete the work.

136. Street Lighting Bracket Adaptor Plate 1 1/4-Inch Thick - Install Only, Item SPV.0060.3027.

A Description
The work under this item includes installation of the street lighting bracket adaptor plate furnished by City of Milwaukee as shown in plans and in accordance with the following.

B Materials
The street lighting bracket arm will be furnished by City of Milwaukee. The contractor shall provide any hardware necessary for the installation.

C Construction
Arrange to pick up street lighting bracket arm from City of Milwaukee Street Lighting Department. Coordinate with Michael Guerrero at (414) 286-5947 for pick up information.

The bracket adaptor plate shall be attached with three ¾" 13NC x 2 ¼" long stainless steel cap screws.

D Measurement
The department will measure Street Lighting Bracket Adaptor Plate 1 1/4-Inch Thick - Install Only as each unit, acceptably completed. The two halves of the adaptor plate are considered one complete unit.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.3027	Street Lighting Bracket Adaptor Plate 1 1/4-Inch Thick - Install Only	Each

Payment is full compensation for picking up the street lighting bracket adaptor plate from City of Milwaukee; for installation and coordination; and providing any hardware necessary to complete the work.

137. Removing Microwave Detector, Item SPV.0060.4001.

A Description
This special provision describes removing an existing side-fire microwave vehicle detector from a pole or sign bridge.

B Materials
Existing side-fire microwave detector and cabling pig-tail.

C Construction
Coordinate removal of microwave detectors with the department's Statewide Traffic Operations Center (STOC) by proposing the removal schedule a minimum of 2-weeks prior to the scheduled removal. Contact the department's STOC representative at (414) 225-3723 to schedule the removal.

Disconnect all cables and wiring that are mounted on or in the structure, and carefully remove the microwave detector. Salvage and store the microwave detector and pig-tail for pick up by the department.

D Measurement
The department will measure Removing Microwave Detector as each individual removed 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.0060.4001	Removing Microwave Detector	Each

Payment is full compensation for disconnecting any necessary wiring; removing the poles and equipment mounted on the poles; and storing the poles and any equipment attached to them.

138. Removing Controller Cabinet, Item SPV.0060.4002.

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 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.0060.4002	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.

139. Removing Controller Cabinet Base, Item SPV.0060.4003.

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 according to the pertinent provisions of standard spec 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 according to the pertinent requirements of the standard specifications.

D Measurement
The department will measure Removing Controller Cabinet Base by each individual removed 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.0060.4003	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; and for topsoil, fertilizer, seed and mulch.

140. Removing Pole, Item SPV.0060.4004.

A Description
This special provision describes removing an existing Type 2, 3, 4, 5, 6, or 7 pole.

B Materials
Existing poles, including antennae, conduit and cabling, and any other equipment mounted to the poles.

C Construction
Disconnect all cables and wiring that are mounted on or in the poles, and carefully remove the pole from the concrete footing. Salvage and store all hardware for pick up by the department. Dispose of the pole and any conduit and cabling appropriately away from the project area.

D Measurement
The department will measure Removing Pole as each individual removed 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.0060.4004	Removing Pole	Each

Payment is full compensation for disconnecting any necessary wiring; removing the poles and equipment mounted on the poles; and for storing the poles and any equipment attached to them.

141. Install CCTV Cabinet, Item SPV.0060.4005.

A Description

This special provision describes installing department furnished aluminum enclosures on new or existing concrete bases and pedestal bases as shown in the plans and directed by the engineer.

B Materials

Cabinet will be furnished by the department.

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.

C Construction

Fasten the field cabinet securely onto a concrete base and pedestal base. 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 service panel, to provide an entrance on the back of the cabinet for cable from the pole mounted intelligent transportation systems equipment, and to mount the service panel to the cabinet as shown in the details. Remove all sharp edges or burrs, or both, caused by the cutting or drilling process. Seal all openings to prevent water from entering the cabinet. Mount the surge protector to the service panel.

D Measurement

The department will measure Install CCTV 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
SPV.0060.4005	Install CCTV Cabinet	Each

Payment is full compensation for installing the pole mounted cabinet; for making all connections and conduit/wire entrances; and for furnsihing all testing.

142. Ground Rod, Item SPV.0060.4006.

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 each 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.0060.4006	Ground Rod	Each

Payment is full compensation for installation of the ground rod and ground wire; and for welding and connections at both ends of the ground wire.

143. Install High Mast Light Tower CCTV Camera, Item SPV.0060.4007.

A Description
This special provision describes installing a CCTV camera and coax cable to Ethernet cable converter on a high mast light tower halo.

B Materials
Materials will be a combination of salvaged, department-furnished, and contractor-furnished.

Salvaged materials will include:

- Hybrid power, coxial, and PTZ control cable
- High mast light tower and halo with CCTV camera mounting system

Department-furnished equipment will include:

- CCTV Camera
- Coaxial cable to Ethernet cable converters

Contractor furnished materials will include:

- Stainless steel bolts, nuts, and washers for mounting hardware.
- Category 5 or better cable for use between the CCTV camera and the coaxial cable to Ethernet cable converter and between the coaxial cable to Ethernet cable converter to the Ethernet switch in the CCTV cabinet.

C Construction

Install the salvaged hybrid camera cable between the high mast light tower and the adjacent FTMS field cabinet as shown on the plans or as directed by the engineer.

Mount the CCTV camera to the salvaged camera mounting system on the high mast light tower halo. Fasten the coaxial cable to Ethernet cable converter to the halo. Fasten the camera to the mounting system and make all wiring connections necessary to make the camera operational.

Install the second coaxial cable to Ethernet cable converter in the CCTV cabinet and connect it to the Ethernet switch as shown on the plans or as directed by the engineer.

D Measurement

The department will measure Install High Mast Light Tower CCTV Camera as each individual assembly, 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.0060.4007	Install High Mast Light Tower CCTV Camera	Each

Payment is full compensation for installing the CCTV camera and coaxial cable to Ethernet cable converters; for installing the salvaged hybrid camera cable; for making all connections; and for furnsihing all testing.

144. Pedestal Bases Black, Item SPV.0060.5001; Traffic Signal Standards Aluminum 10-FT Black, Item SPV.0060.5002; 13-FT Black, Item SPV.0060.5003; 15-FT Black, Item SPV.0060.5004.

A Description

This special provision describes furnishing and installing Pedestal Bases Black, Poles (type) Black, Traffic Signal Standards Aluminum (height) Black, at the locations shown in the plan, according to the pertinent provisions of standard spec 657 and as hereinafter provided. All items to have a Black Powder Coat Finish.

B Materials

Furnish Pedestal Bases, Poles, Traffic Signal Standards, Trombone Arms and Luminaire Arms according to standard spec 657.2 except as noted here.

Furnish all Pedestal Bases, Poles, Traffic Signal Standards, with a powder coat finish, gloss black in color. Apply a polyester powder coat electrostatically to all cleaned and treated surfaces to a uniform 8 mil thickness in a one-coat application. Cure the powder coat in a convection oven at a 400° F minimum temperature to form a high molecular weight fusion bonded finish. Alternate powder coat methods may be reviewed and tested on a case by case basis. However, no alternate coating method will be used unless the Commissioner determines that the alternate is equal to the specified coating system. Measure coating thickness according to SSPC-PA-2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges", except that the lowest "single spot measurement" in an area of two square inches shall be not less than 7.0 mils.

The exterior coat shall pass 1,000 hours of salt spray exposure per ASTM B117 in a 5% Na C1 (by weight) solution at 95° F and 95% relative humidity without blistering. Before testing, scribe the panel with an "X" down to bare metal.

The poles shall be gloss black in color, unless otherwise indicated. Submit color sample for approval prior to fabrication. This color sample shall include the manufacturer's name and the manufacturer's color name as well as any other information required to purchase the same color for all pole accessories such as the arms, bracelets, and split pedestal bases.

C (Vacant)

D Measurement

The department will measure Pedestal Bases Black, and Traffic Signal Standards Aluminum (height) Black, as each 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.0060.5001	Pedestal Bases Black	Each
SPV.0060.5002	Traffic Signal Standards Aluminum 10-FT Black	Each
SPV.0060.5003	Traffic Signal Standards Aluminum 13-FT Black	Each
SPV.0060.5004	Traffic Signal Standards Aluminum 15-FT Black	Each

Payment for Pedestal Bases and Traffic Signal Standards is full compensation for providing the black pedestal bases, and signal standards including grounding lugs and related mounting hardware; for hardware and fittings necessary to install; for leveling shims; for installing identification plaques; and for corrosion prevention.

145. Pull Box, Vault 17”X30”X18”, Item SPV.0060.5005.

A Description

This special provision describes furnishing and installing polymer concrete vaults according to the Traffic or Street Lighting Detail drawings for the Typical Rectangular Polymer Concrete Vault Installation. All work shall be according to standard spec 651.

B Materials

B.1

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 are not acceptable.

B.2

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.

B.3

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.4 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 according to procedures outlined in ASTM D-695

Comprehensive Strength (fiberglass reinforced polymer): 22,500 PSI tested according to ASTM D-695

Flexural Strength (fiberglass reinforced polymer): 18,700 PSI tested according to ASTM D-790

Tensile Strength (fiberglass reinforced polymer): 12,100 PSI tested according to procedures outlined in ASTM D-638

Tensile Modulus of Elasticity (fiberglass reinforced polymer): 8.6 x 10^5 PSI tested according to procedures outlined in ASTM D-638
Splitting Tensile Strength (polymer concrete): Tested according to procedures outlined in ASTM C-496

Accelerated Service: Tested according to procedure E outlined in ASTM D-756

Water Absorption: Tested according to ASTM D-570 outlined in sections 6.1 and 6.5

Impact Resistance (fiberglass reinforced polymer concrete): 72 foot pounds according to ASTM D-2444 administered with a "C" tup

Skid Resistance: 0.60 coefficient of friction according to ASTM C-1028

Flammability Test: Tested according to ASTM D-635

Ultraviolet Exposure: Tested according 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

B.5
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 SIGNALS" 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 with the Traffic or Street Lighting Detail drawings for the Typical Rectangular Polymer Concrete Vault Installation.

Conform to current City of Milwaukee Street Lighting Typical Detail Installation standards. Provisions for inserting conduit into any side or the bottom of the vault shall be included.

D Measurement
The department will measure Pull Box, Vault 17”X30”X18” 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.0060.5005	Pull Box, Vault, 17”X30”X18”	Each

Payment is full compensation for providing polymer concrete vaults.

146. Concrete Bases Type 10 Special, Item SPV.0060.5006.

A Description
This special provision describes constructing a concrete base type 10 special with a 36-inch diameter for monotube mast arm structures according to standard spec 654 with modifications as shown on the plans, and as hereinafter provided.

B Materials
Modify standard spec 654.2 as follows:

Contractor shall supply templates, anchor rods, nuts, and washers for installation as shown on the plans.

C Construction
Construction of this item shall conform with standard spec 654.

Contractor shall contact City of Milwaukee sewer engineering five working days prior to excavating any concrete bases at (414) 286-2467 to confirm lateral clearance with sewer facilities.

D Measurement
The department will measure each Concrete Bases Type 10 Special as each individual concrete 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.0060.5006	Concrete Bases Type 10 Special	Each

Payment is full compensation for providing concrete bases.

147. Poles Type 12 Special, Item SPV.0060.5007; Type 13 Special, Item SPV.0060.5008; Type 13 Special Black, Item SPV.0060.5009.

A Description
Work under this item consists of furnishing and installing monotube poles.

B Materials
Design support structures conforming to the minimum wall thickness the plan details show and to AASHTO design and fabrication standards for structural supports for highway signs, luminaries, and traffic signals. Use a design life of 50 years. Design to withstand a three second gust wind speed of 90 mph (145 km/h). Do not use the methods of Appendix C of those AASHTO standards.

Use category II criteria for 35 to 55-foot arms.

For structures requiring a fatigue analysis, use 45 mph (72 km/h) for truck-induced gusts.

Obtain engineer approval prior to ordering monotubes.

After welding and before zinc coating, clean the exterior surface of each steel pole free of all loose rust and mill scale, dirt, oil or grease, and other foreign substances.

Apply a zinc coating conforming to the process specified for steel sign bridges in standard spec 641.2.8. Ensure that the zinc coating is tight, free from rough areas or slag, and presents a uniform appearance.

After completing manufacturing, clean the exterior surfaces of each pole free of all loose scale, dirt, oil or grease, and other foreign substances.

Provide a reinforced hand hold measuring 4 inches by 6 inches (100 mm by 150 mm) as the plans show. Locate the hand hole 18 inches (450 mm) from the bottom of the pole base to the center of the door.

For the hand hole, include an access cover mounted to the pole by two ¼” -20 x ¾” (m6 x 1.00 x 19 mm) hex-head stainless steel bolts.

Provide a grounding lug complete with mounting hardware, as required, inside the pole as the plans show.

Provide access to the grounding lug from the hand hole. Weld the ground lug directly opposite the hand hole on the inside wall of the pole.

Equip the top of the shaft with a removable, ventilated cap held securely in place by at least three ¼” -20 x ¾” (m6 x 1.00 x 19 mm) hex-head stainless steel set screws.

Ensure that all castings are clean, smooth, and with all details well defined and true to pattern.

Attach base plates firmly to the pole shaft by welding or other approved method.

Include anchor bolts meeting AASHTO standards applicable to the pole type and loading. Provide a mounting template that ensures correct installation of anchor bolts in foundation.

For Poles Type 13 Special Black:
Apply a polyester powder coat electrostatically to all cleaned and treated surfaces to a uniform 8 mil thickness in a one-coat application. Cure the powder coat in a convection oven at a 400° F minimum temperature to form a high molecular weight fusion bonded finish. Alternate powder coat methods may be reviewed and tested on a case by case basis. However, no alternate coating method will be used unless the Commissioner determines that the alternate is equal to the specified coating system. Measure coating thickness according to SSPC-PA-2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges", except that the lowest "single spot measurement" in an area of two square inches shall be not less than 7.0 mils.

The exterior coat shall pass 1,000 hours of salt spray exposure per ASTM B117 in a 5% Na C1 (by weight) solution at 95° F and 95% relative humidity without blistering. Before testing, scribe the panel with an "X" down to bare metal.

The poles shall be gloss black in color, unless otherwise indicated. Submit color sample for approval prior to fabrication. This color sample shall include the manufacturer's name and the manufacturer's color name as well as any other information required to purchase the same color for all pole accessories such as the arms, bracelets, and split pedestal bases.

C Construction
Install poles as specified in the plan details and using appropriate contractor-furnished anchor bolts and hardware. Use the appropriate anchor bolt template to ensure correct installation. Secure pole to anchor assembly and document tensioning procedures conforming to standard spec 657.3.2 and provide completed copies of form DT2321 for each structure to the engineer for inclusion in the permanent record.

After completing erection using normal pole shaft raking techniques, ensure the centerline of the shaft appears vertical.

D Measurement
The department will measure each Poles Type 12 Special, Poles Type 13 Special, and Poles Type 13 Special Black as 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.0060.5007	Poles Type 12 Special	Each
SPV.0060.5008	Poles Type 13 Special	Each
SPV.0060.5009	Poles Type 13 Special Black	Each

Payment is full compensation for providing and installing poles including all hardware and fittings necessary to install the poles.

148. Monotube Arms 40-FT, Item SPV.0060.5010; Black 40-FT, Item SPV.0060.5011.

A Description
Work under this item consists of furnishing and installing monotube arms.

B Materials
Design support structures conforming to the minimum wall thickness the plan details show and to AASHTO design and fabrication standards for structural supports for highway signs, luminaires, and traffic signals. Use a design life of 50 years. Design to withstand a 3 second gust wind speed of 90 mph (145 km/h). Do not use the methods of appendix C of those AASHTO standards.

Use category III criteria for 15 to 30-foot arms. Use category II criteria for 35 to 55-foot arms.

For structures requiring a fatigue analysis, use 45 mph (72 km/h) for truck-induced gusts.

Obtain engineer approval prior to ordering monotubes.

Base the designs on the completed maximum loading configuration the standard detail drawing shows. Along with the materials list, submit a certificate of compliance certifying that the arms as furnished conform to the above structural performance requirements. Ensure that the certificate of compliance is on the manufacturer's letterhead, signed by an authorized company officer, and notarized. Send a copy of the certificate and a copy of the monotube arm shop drawings to the department electrical engineer.

Furnish monotube arms conforming to the following:

1. Consist of zinc coated steel round or oval members.

2. Have a mounting device welded to the pole end of the monotube arm that allows the attachment of the arm to a pole as the plans show.

3. Have stiffeners or gussets if required between the arm tube and the arm mounting device to provide adequate strength to resist side loads.

4. Have a clean, uniform natural finish. No paint or other corrosion preventive maintenance coating is required.

After welding and before zinc coating, clean exterior surfaces of each arm free of all loose rust and mill scale, dirt, oil or grease, and other foreign substances.

Apply zinc coating as specified for sign bridge components in standard spec 641.2.8. Ensure that the zinc coating is tight, free from rough areas or slag, and presents a uniform appearance.

After manufacturing is complete, clean the exterior surfaces of each pole free of all loose scale, dirt, oil, or grease, and other foreign substances.

For Monotube Arms Black:
Apply a polyester powder coat electrostatically to all cleaned and treated surfaces to a uniform 8 mil thickness in a one-coat application. Cure the powder coat in a convection oven at a 400° F minimum temperature to form a high molecular weight fusion bonded finish. Alternate powder coat methods may be reviewed and tested on a case by case basis. However, no alternate coating method will be used unless the Commissioner determines that the alternate is equal to the specified coating system. Measure coating thickness according to SSPC-PA-2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges", except that the lowest "single spot measurement" in an area of two square inches shall be not less than 7.0 mils.

The exterior coat shall pass 1,000 hours of salt spray exposure per ASTM B117 in a 5% Na C1 (by weight) solution at 95° F and 95% relative humidity without blistering. Before testing, scribe the panel with an "X" down to bare metal.

The arms shall be gloss black in color, unless otherwise indicated. Submit color sample for approval prior to fabrication. This color sample shall include the manufacturer's name and the manufacturer's color name as well as any other information required to purchase the same color for all pole accessories such as the arms, bracelets, and split pedestal bases.

C Construction
Install monotube arms as specified in the plan details and using appropriate contractor-furnished hardware.

Prior to installation of each monotube arm, a 1 1/4-inch hole shall be drilled into the bottom of the arm approximately centered over each driving lane as shown on the plans. Where emergency vehicle pre-emption (EVP) is installed, a separate 1 1/4-inch hole shall be drilled in the bottom of the arm approximately centered over the roadway approach, but a minimum of four feet from the nearest drilled hole.

The contractor shall provide 9-14 AWG traffic signal cable spooled 5 feet outside the arm from each drilled hole in the arm, including the hole for EVP if applicable, to the base of

the pole below the hand hole. Where applicable, also provide a separate nylon pull rope for the EVP hole to the base of the pole below the hand hole.

D Measurement
The department will measure Monotube Arms 40 FT and Monotube Amrs Black 40-FT as each individual arm, acceptably completed.

E Payment
The department will pay for measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5010	Monotube Arms 40-FT	Each
SPV.0060.5011	Monotube Arms Black 40-FT	Each

Payment is full compensation for providing and installing all materials, including all hardware, fittings, mounting devices, shims, and attachments necessary to completely install the arms.

149. Electrical Riser, Item SPV.0060.5012.

A Description
This work shall consist of furnishing and installing the electrical riser for installation of signal equipment on the outside of city lighting equipment as shown on the plans and as hereinafter provided. The riser begins at the pull box nearest the lighting equipment as shown on the plans and terminates at the traffic signal mounting equipment.

B Materials
Use materials detailed in the plans including: non-metallic conduits. rigid aluminum conduits, aluminum condulets, reducer bushings, flexible conduits, banding, terminal adapters, weather heads. etc. Provide all other needed materials in conformance with standard spec 651.2, 652.2, 653.2, 657.2, 658.2 and 659.2.

C Construction
Perform all electrical work according to standard spec 651.3, 652.3, 653.3, 657.3, 658.3 and 659.3.

D Measurement
The department will measure Electrical Riser as each assembly, acceptably completed.

E Payment
The department will pay for measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5012	Electrical Riser	Each

Payment is full compensation for furnishing and installing all necessary equipment for electoral riser installation for traffic signal equipment mounted on city light poles and for making all connections necessary to complete the work.

150. Junction Box 12”X12”X6”, Item SPV.0060.5013.

A Description

This special provision describes furnishing and installing a 12”X12”X6” junction box that will be mounted to the exterior of a bridge parapet for the use of installing microwave detection system.

B Materials

Furnish 12”x12”x6” junction boxes that are weather tight, UL50 and NEMA 3R rated. Submit shop drawings to engineer for approval prior to ordering junction boxes. Shop drawing submittal shall include mounting details for approval.

The junction boxes shall be able to accommodate the conduits for the microwave detection system as shown in the plans. All connections shall be weather tight.

C Construction

Install Junction Box on exterior of parapet using approved mounting.

Installation may require drilling through the existing bridge parapet to make conduit connections. Drilling is considered incidental to Junction Box installation.

D Measurement

The department will measure Junction Box 12”X12”X6” as each unit, acceptably completed.

E Payment

The department will pay for measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.5013	Junction Box, 12”X12”X6”	Each

Payment is full compensation for furnishing and installing 12”X12”X6” junction box, drilling through bridge parapet, and providing weather tight connections to conduit.

151. Poles Type 9, Item SPV.0060.5014; Type 10, Item SPV.0060.5015; Type 12, Item SPV.0060.5016.

A Description

This special provision describes furnishing and installing monotube poles.

B Materials

Design support structures conforming to the minimum wall thickness the plan details show and to AASHTO design and fabrication standards for structural supports for highway signs, luminaries, and traffic signals. Use a design life of 50 years. Design to withstand a 3 second gust wind speed of 90 mph (145 km/h). Do not use the methods of Appendix C of those AASHTO standards.

Use Category III criteria for Type 9 and Type 10 Poles. Use Category II criteria for Type 12 and Type 13 Poles.

For structures requiring a fatigue analysis, use 45 mph (72 km/h) for truck-induced gusts.

After welding and before zinc coating, clean the exterior surface of each steel pole free of all loose rust and mill scale, dirt, oil or grease, and other foreign substances.

Apply a zinc coating conforming to the process specified for steel sign bridges in standard spec 641.2.8. Ensure that the zinc coating is tight, free from rough areas or slag, and presents a uniform appearance.

After completing manufacturing, clean the exterior surfaces of each pole free of all loose scale, dirt, oil or grease, and other foreign substances.

Provide a reinforced hand hole measuring 4 inches by 6 inches (100 mm by 150 mm) as the plans show. Locate the hand hole 18 inches (450 mm) from the bottom of the pole base to the center of the door.

For the hand hole, include an access cover mounted to the pole by two ¼”-20 x ¾” (m6 x 1.00 x 19 mm) hex-head stainless steel bolts.

Provide a grounding lug complete with mounting hardware, as required, inside the pole as the plans show.

Provide access to the grounding lug from the hand hole. Weld the ground lug directly opposite the hand hole on the inside wall of the pole.

Equip the top of the shaft with a removable, ventilated cap held securely in place by at least 3 ¼” -20 x ¾” (m6 x 1.00 x 19 mm) hex-head stainless steel set screws.

Ensure that all castings are clean, smooth, and with all details well defined and true to pattern.

Attach base plates firmly to the pole shaft by welding or other approved method.

Provide anchor bolts meeting AASHTO standards applicable to the pole type and loading (see SDD 9E 8 for specific pole types).

Provide anchor bolt templates as shown on the standard detail drawings for the concrete base to ensure correct alignment of anchor bolts in foundation (see SDD 9C 11 and 9C 12 for specific base types).

C Construction
Install poles as specified in the plan details. Secure pole to anchor assembly and document tensioning procedures conforming to standard spec 641.3.1.2.

After completing erection using normal pole shaft raking techniques, ensure the centerline of the shaft appears vertical.

D Measurement
The department will measure Poles (Type) as 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.0060.5014	Poles Type 9	Each
SPV.0060.5015	Poles Type 10	Each
SPV.0060.5016	Poles Type 12	Each

Payment is full compensation for providing monotube poles including all hardware and fittings necessary to install the poles.

152. Monotube Arms 20-FT, Item SPV.0060.5017; 25-FT, Item SPV.0060.5018; 30-FT, Item SPV.0060.5019; 50-FT, Item SPV.0060.5020.

A Description
This special provision consists of furnishing and installing monotube arms.

B Materials
Design support structures conforming to the minimum wall thickness the plan details show and to AASHTO design and fabrication standards for structural supports for highway signs, luminaires, and traffic signals. Use a design life of 50 years. Design to withstand a 3 second gust wind speed of 90 mph (145 km/h). Do not use the methods of appendix C of those AASHTO standards.

Use category III criteria for 15 to 30-foot arms. Use category II criteria for 35 to 55-foot arms.

For structures requiring a fatigue analysis, use 45 mph (72 km/h) for truck-induced gusts.

Base the designs on the completed maximum loading configuration the standard detail drawing shows. Along with the materials list, submit a certificate of compliance certifying that the arms as furnished, conform to the above structural performance requirements. Ensure that the certificate of compliance is on the manufacturer's letterhead, signed by an authorized company officer, and notarized. Send a copy of the certificate and a copy of the monotube arm shop drawings to the city engineer.

Furnish monotube arms conforming to the following:

1. Consist of zinc coated steel round or oval members.

2. Have a mounting device welded to the pole end of the monotube arm that allows the attachment of the arm to a pole as the plans show.

3. Have stiffeners or gussets if required between the arm tube and the arm mounting device to provide adequate strength to resist side loads.

4. Have a clean, uniform natural finish. No paint or other corrosion preventive maintenance coating is required.

After welding and before zinc coating, clean exterior surfaces of each arm free of all loose rust and mill scale, dirt, oil or grease, and other foreign substances.

Apply zinc coating as specified for sign bridge components in standard spec 641.2.8. Ensure that the zinc coating is tight, free from rough areas or slag, and presents a uniform appearance.

After manufacturing is complete, clean the exterior surfaces of each pole free of all loose scale, dirt, oil, or grease, and other foreign substances.

C (Vacant)

D Measurement

The department will measure Monotube Arms (Length) as each individual arm, 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.0060.5017	Monotube Arms 20-FT	Each
SPV.0060.5018	Monotube Arms 25-FT	Each
SPV.0060.5019	Monotube Arms 30-FT	Each
SPV.0060.5020	Monotube Arms 50-FT	Each

Payment is full compensation for providing all materials, including all hardware, fittings, mounting devices, shims, and attachments necessary to completely install the arms.

153. No-Mow Fescue Seed Mix, Item SPV.0085.1001.

A Description

This special provision describes a custom low-maintenance, no-mow fescue seed mix to be used in lieu of the seed mix options provided in the standard specifications. All other portions of standard spec 630 Seeding shall apply to this special provision. All No-Mow Fescue seeding areas shall be covered with Erosion Mat Class I Type A from the standard specifications. Erosion Mat is paid for under a separate bid item.

B Materials

No-Mow Fescue Seed Mix as produced by Prairie Nursery, www.prairienursery.com, (800) 476-9453, and shall be comprised of the following species:

Festuca brevipila	Hard Fescue (provide two different varieties)
Festuca ovina	Sheep Fescue
Festuca rubra subs. fallax	Chewings Fescue
Festuca rubra	Red Fescue
Festuca rubra var. rubra	Creeping Red Fescue

No substitutions allowed.

C Construction

As defined in SECTION 630 Seeding from the Standard Specifications. All existing weed species shall be removed from the seed bed prior to installation. Install No-Mow Fescue Seed using Sowing Method A and at time of year as recommended by seed producer. Apply at seeding rate of 5 lb. per 1000 sq. feet.

D Measurement

The department will measure No-Mow Fescue Seed Mix by the pound, 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.0085.1001	No-Mow Fescue Seed Mix	LF

Payment for No-Mow Fescue Seed Mix is full compensation for providing, handling, and storing all seed; for providing the required culture and inoculating seed as specified; and for preparing the seed bed including the elimination of all existing weed species, sowing, covering and firming the seed.

154. Aluminum Edger, Item SPV.0090.1003.

A Description
This special provision describes furnishing and installing Aluminum Edger as shown on the plans, and as hereinafter provided.

B Materials
Aluminum Edger to be 3/16-inch by 4-inch size, color to be black, aluminum stakes to be 15-inch length, maximum 5 foot spacing.

Samples: Submit two 6-inch long samples indicating size and color to engineer a minimum of 10 days before use, for approval prior to construction.

C Construction
Install the Aluminum Edger according to the manufacturer's instructions. The Aluminum Edger is to be installed as indicated on the Landscape Details.

D Measurement
The department will measure Aluminum Edger 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.0090.1003	Aluminum Edger	LF

Payment is full compensation for furnishing and delivering all materials and samples, including aluminum stakes, for installing aluminum edger as per the plan details, manufacturer's instructions, and these special provisions.

155. Precast Concrete Curbing, Item SPV.0090.1004.

A Description
This special provision describes furnishing and installing fabricated precast concrete curbing and associated connection hardware according to the dimensions, elevations and details as shown on the Drawings and provided in the contract. Construction work includes the excavation and removal of existing material from project site in order to accommodate placement of new precast concrete curbing.

B Materials
Precast concrete components shall include cement that is processed from ASTM C150 Type 1-Portland Cement. Sand shall be according to ASTM C33. Water shall be according to ASTM C330. Air entrainment admixture shall be according to ASTM C260.

Color to match Graphite colored Concrete Paver as closely as possible. Refer to SPV.0165.1001 for more information and contact information.

Reinforcement shall be epoxy coated according to A775, with strength and size commensurate with precast concrete curbing design.

Surface finish aggregate: Clean, smooth finish from single source throughout conforming to ASTM C33.

Sealant: Color to match precast concrete.

Related components include fabricated galvanized steel anchor bolts capable of anchoring precast concrete curbs to a minimum depth of 2 inches into substrate. Connection plates shall be fabricated from galvanized steel to the following dimensions of 1/4 inch by 4 inches by 6 inches.

Shop Drawings: Submit shop drawings of all precast concrete curbing showing detail sections, elevations, and profile for all precast items to engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, for approval prior to construction. Details shall show all reinforcing and special hardware required for fastening curb sections together in the field.

Samples: Submit two minimum 4-inch by 6-inch sample pieces of precast concrete curb illustrating color to match pavers, surface finish and texture to engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, for approval prior to construction.

Mock-up: Construct mock-up for one entire precast concrete curb planter including connection hardware and joint sealer to be approved by engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400.

Approval of mock-up is required prior to beginning construction. Failure to receive mock-up approval may result in rejection of work. The approved mock-up will be the standard from which the Work will be judged and approved by the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400. Incorporate accepted mock-up as part of work.

Locate mock-up where directed by the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400.

Notify the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, seven days in advance of dates and times when mock-ups will be constructed.

Qualifications: Precast Concrete Manufacturer and Trade Contractor must have a minimum of five years of successful experience on projects of similar magnitude and complexity to that of this Project. Manufacturer and contractor to be prequalified by owner's representative prior to bidding. Failure to prequalify will void bid.

Manufacturer to supply a written Quality Assurance Program and Procedure Manual.

C Construction

Factory fabrication shall be produced using fabricated steel forms for quality control of uniformity and dimensions to the detailed size as shown on the plans. Curbing shall be free of fins, honeycombing and other irregularities. Curbing shall be fabricated with straight and accurate edges and surfaces.

Precast Concrete Curb Installation:

1. Excavate area to required depth and dimensions as indicated on plans and remove spoils from project site.
2. Compact placed aggregate materials to achieve compaction of 95 percent modified Proctor density.
3. Place units without damage to shape or finish. Replace damaged panels.
4. Connect precast concrete curb units using galvanized steel plates with stainless steel anchors.
5. Plates shall be rigidly secured to prevent any movements.
6. Erect units level and plumb within allowable tolerances.
7. Align and maintain uniform horizontal and vertical joints as erection progresses. Set vertical units dry, without grout, attaining joint dimension with lead or plastic spacers. Pack grout to base of unit.
8. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, immediately.
9. Seal perimeter and intermediate joints.
10. Erection Tolerances
    - Exposed vertical joint dimension: ¼-inch
    - Exposed horizontal perimeter joint dimension: ½-inch
    - Maximum variation from plane of location: ¼-inch in 10 feet.
    - Maximum offset from indicated alignment between two connecting units: 1/8-inch.
    - Joint tolerance: plus or minus 1/8-inch.

D Measurement

The department will measure Precast Concrete Curbing 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.0090.1004	Precast Concrete Curbing	LF

Payment is full compensation for providing precast concrete curbing and for furnishing all shop drawings, samples, mock-ups, connection plates and fastening hardware. Excavation and removal of existing material from project site are considered incidental to Precast Concrete Curbing.

156. Cast-In-Place Concrete Salt Lip Curb, Item SPV.0090.1005.

A Description

This special provision describes furnishing and installing Cast-In-Place Concrete Salt Lip Curb according to the dimensions, elevations and details as shown on the drawings and provided in the contract. Construction work includes the excavation and removal of existing material from project site in order to accommodate placement of new precast concrete curbing.

B Materials

Furnish materials according to standard spec 601.

Mock-Up: Construct mock-up for one entire street tree salt lip curb planter including connection hardware and joint sealer to be approved by engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400.

Approval of mock-up is required prior to beginning construction. Failure to receive mock-up approval may result in rejection of work. The approved mock-up will be the standard from which the work will be judged and approved by the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400. Incorporate accepted mock-up as part of work.

Locate mock-up where directed by the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400.

Notify the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400) seven days in advance of dates and times when mock-ups will be constructed.

C Construction

Install according to standard spec 601.

D Measurement

The department will measure Cast-In-Place Concrete Salt Lip Curb 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.0090.1005	Cast-In-Place Concrete Salt Lip Curb	LF

Payment for furnishing all Cast-In-Place Concrete Salt Lip Curb is full compensation according to standard spec 601.

157. 6-Duct Conduit, Cement Encased, 4-Inch Rigid Nonmetallic Conduit DB-60, Item SPV.0090.1006, 2-Duct Conduit, Cement Encased, 4-Inch Rigid Nonmetallic Conduit DB-60, Item SPV.0090.1007, 1-Duct Conduit, Cement Encased, 4-Inch Rigid Nonmetallic Conduit DB-60, Item SPV.0090.1008.

A Description

This work consists of furnishing and installing cement encased multiple duct conduit packages below grade as shown on the plans and as hereinafter described.

B Materials

1. Conduit. The contractor shall furnish DB-60 polyvinyl chloride (PVC) conduit. Conduit will be accepted on the basis of a Manufacturer's Certificate of Compliance and WISDOT field inspection upon delivery to a project.

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).

2. Conduit Spacers. The contractor shall furnish and install nonmetallic Snap-Loc 4 x 1 base spacer (part number S288NFN) and intermediate spacer (part number S289NFN) manufactured by Carlon or engineer (City of Milwaukee) approved equal.

3. Conduit Bed. The contractor shall furnish and install a minimum 2" conduit bed of stone chips or crushed stone screenings conforming to the following:

3/8 Inch Crushed Stone Chips

Sieve Sizes	% Passing by Weight
½"	100
3/8"	90-100
No. 8	0-15
No. 30	0-3

Crushed Stone Screenings

Sieve Sizes	% Passing by Weight
½”	100
No. 4	75-100
No. 100	10-25

4. Concrete. The type of concrete mix to be used to encase the ducts will be:

Type I Cement	280 lbs
Fly Ash	100 lbs
Sharp Torpedo Sand	3100 lbs
Water	35 gals
Chryso Air 260	2.0 ozs
Chryso Plast 209	7.0 ozs
Air	5%

Once mixed, the materials shall have an approximate 3 inch slump.

5. 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.

Mix the materials with water to inundate the aggregate sufficiently to provide an approximate 3 inch slump. Deposit the mix in the trench directly from a concrete transit mix truck.

6. 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

Notify the City of Milwaukee, Anthony Kotecki, Civil Engineer III - City of Milwaukee Construction Utility Coordinator, (414) 286-2433 office, (414) 708-3886 mobile; one week prior to beginning work for inspection purposes.

1. 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”
5	31”	33 1/2”
6	36 5/8”	39 1/8”
7	42 1/4”	44 3/4”
8	47 7/8”	50 3/8”

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. Protect the exposed manhole and conduit from damage.

Lay the conduit 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.

Grade the trench 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 crushed stone screenings shall be used for grading the trench. The duct bed shall be a minimum of 2" in depth.

2. Placing of Duct. Placing of the duct is to proceed as soon as the duct bed has been completed. Inspect all ducts 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. Smooth off by rasping or scraping any burrs or other rough areas found in the duct, so that they do not damage cable.

Place the duct on base spacers 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, place the cut end at the manhole. The base spacers shall be located within 2 feet of the end of each duct and one base spacer located in the middle of the duct.

Use full length pieces 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, the next higher tier of ducts shall then be placed on the intermediate spacers. Place these intermediate spacers on top of the base spacers located within two feet from each duct end and one in the middle of each duct. Place the intermediate spacers and ducts for the remaining tiers. Glue each length into the adjoining coupling. A twist and push on the duct being placed will suffice for a water tight joint. Exercise caution in the driving operation, so that neither the coupling nor the duct are split or damaged in any way. After the full formation has been completed, place wood trench and duct bracing 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 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. Install a standard end bell fitting flush with the wall on all duct access points.

Install a #10 copper tracer wire along and above the centerline of the duct for encasement in the concrete. The wire shall be 4 feet longer than the run of conduit and be at least 2 feet long at each access point.

Install a pull rope in each run of conduit, as laid. The rope shall be 4 feet longer than the run of conduit and shall be doubled back at least 2 feet at each raceway access point. Anchor the pull rope at each access point in a manner acceptable to the engineer.

3. Concreting. After sufficient conduit has been laid and the trench and duct have been inspected, begin concreting. 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. After placing, the concrete shall be puddled with a splicing bar or similar tool so that complete duct encasement is accomplished. Remove any wood braces used to keep the conduit from floating before the concrete sets completely and the resultant encasement voids filled with concrete.

Allow concrete encasement to set for a minimum of 6 hours before backfilling.

4. Slurry Backfill. Commence backfilling of the conduit after the duct has been inspected, approved and has had sufficient time to set to withstand the load.

Aggregate slurry backfill, as specified, shall be used to backfill all concrete encased conduit. Backfill the trench to the proposed or existing subgrade. Deposit the mix into the trench directly from a concrete transit mix truck.

D Measurement

The department will measure (X)-Duct Conduit, Cement Encased, 4-Inch Rigid Nonmetallic Conduit DB-60 by the linear foot acceptably installed. The measured quantity will equal the linear feet of encased duct, based on the distance along the centerline of duct between ends of conduit. City of Milwaukee shall have final acceptance.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.1006	6-Duct Conduit, Cement Encased, 4-Inch Conduit DB-60	LF
SPV.0090.1007	2-Duct Conduit, Cement Encased, 4-Inch Conduit DB-60	LF
SPV.0090.1008	1-Duct Conduit, Cement Encased, 4-Inch Conduit DB-60	LF

Payment is full compensation for providing the conduit, conduit bodies, conduit fittings, conduit spacers, end caps and trace wire; 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.

158. Strip Drains, Item SPV.0090.1009; Pre-bored Strip Drains, Item SPV.0090.1010.

A Description

This special provision describes furnishing and installing prefabricated strip drains after the drainage blanket has been installed. Perform all work according to the plans and as provided herein.

B Materials

The strip drains shall be prefabricated and consist of a plastic or polyethylene core wrapped in a filter geotextile fabric. They shall be ALIDRAIN, AMER-DRAIN Type 407, MEBRA-DRAIN or an approved equal. The core shall be fabricated with suitable drainage channels.

Every component of the strip drains shall be insect, rodent, mildew, and rot resistant.

Furnish the strip drains in a wrapping which will protect them from abrasion due to shipping and hauling. Keep the strip drains dry until installed.

Clearly mark the strip drain rolls showing the type of vertical drain.

Furnish the engineer for approval manufacturer's certifications and strip drain samples a minimum of 14 days prior to delivery of the strip drains to the site. Only one type of strip drain, i.e. strip drain made by the same manufacturer and of the same dimensions and in-plane flow rate, shall be used for the entire project. The delivered strip drains shall bear markings to clearly identify it with the manufacturer's certifications previously furnished to the engineer.

C Construction

Install strip drains with approved equipment of a type which will cause a minimum disturbance of the subsoil during the installation operation. Install the strip drain using a mandrel or sleeve which completely encloses the strip drain, thereby protecting it from tears, cuts, and abrasions during installation. The mandrel or sleeve shall be of minimal cross-sectional area.

Submit details of the sequence and method of strip drain installation to the engineer by the contractor a minimum of 14 days prior to the installation of the vertical drains for the engineer's approval. Approval by the engineer will not relieve the contractor of his responsibility to install the strip drains according to these specifications.

Prior to the installation of strip drains within the designated areas, demonstrate that his equipment, installation method, and materials produce a satisfactory installation according to these specifications. For this purpose the contractor shall be required to install trial strip drains at locations designated by the engineer. Payment will be at the unit price per linear foot for the strip drains. Payments will not be made for installing unsatisfactory trial strip drains.

Approval by the engineer of the method and equipment used to install the trial drains shall not constitute acceptance of the method for the remainder of the project. If at any time the engineer considers that the method of installation does not produce a satisfactory drain, the contractor shall alter his method or equipment as necessary to comply with these specifications.

Strip drains shall be located, numbered, and staked out by the contractor. Do not vary the locations of drains by more than 6 inches from the locations indicated in the plan documents or as directed by the engineer.

Force vertically the mandrel with the strip drain inside into the ground to the depth shown on the contract documents. Retract the mandrel leaving the strip drain in place to function as a vertical drain. Cut the strip drain neatly at its upper end with a 12 inch length of drain material extending above the drainage blanket.

Re-level the surface of the granular sub-base course disturbed by strip drain installation equipment. Re-grading will not be allowed. Repair any excessive rutting or deformations in the drainage blanket as directed by the engineer at no additional cost to the department.

Splices or connections in the strip drain material will not be allowed.

It is estimated that up to 10% of the strip drains may need to be pre-bored. However the contractor shall not pre-bore strip drains without prior written approval of the engineer. Pre-bored strip drains without the approval of the engineer will not be measured or paid.

Carefully check the equipment for plumbness prior to advancing each strip drain and must not deviate more than 1 inch per foot from the vertical.

When obstructions are encountered below the working surface which in the opinion of the engineer cannot be penetrated using normal and accepted procedures, complete the drain from the elevation of the obstruction to the working surface. At the direction of the engineer, install a new drain within 18 inches from the obstructed drain. The contractor shall be compensated for all obstructed drains at the contract unit price unless the drain is improperly installed.

Observe precautions necessary for protection of instrumentation devices. After instrumentation devices have been installed, replace any equipment that is damaged or becomes unreliable due to construction operations at the cost of the contractor.

Strip drains that are out of their proper location by more than 6 inches, strip drains that are damaged during construction or strip drains that are improperly installed shall be rejected by the engineer and no compensation will be made for any materials furnished or for any work performed on such drains.

Supply the engineer with a suitable means of making a linear determination of the quantity of strip drain material used at each strip drain location. During installation of the strip drain, provide suitable means of determining the depth of the strip drain.

D Measurement

The department will measure Strip Drains and Pre-bored Strip Drains by the linear foot for the full length of strip drain installed, acceptably completed. The contractor will not be paid for any more than an 18 inch length of strip drain extending above the drainage blanket.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.1009	Strip Drains	LF
SPV.0090.1010	Pre-bored Strip Drains	LF

Payment is full compensation for the cost of furnishing the strip drain material, pre-drilling, installation, altering of the equipment and methods of installation in order to produce the required end result according to the plans and specifications. No payment will be made for unacceptable strip drains or for any delays or expense incurred through changes necessitated by improper or unacceptable material or equipment.

159. Irrigation Sleeve, 2-Inch, Item SPV.0090.1011; 3-Inch, Item SPV.0090.1012; 4-Inch, Item SPV.0090.1013.

A Description

This special provision describes furnishing and installing a water irrigation sleeve and related appurtenances for irrigation as shown on the Drawings, and as hereinafter provided.

B Materials

B.1 PVC Pipe

All PVC schedule 40 pipe shall be manufactured from Type I, Grade I polyvinyl chloride compound and shall conform to ASTM D1785 and D2665 (where applicable)

C Construction

The locations of the irrigation services shown on the drawings are general in nature. The contractor shall provide all fittings and piping as necessary to construct Irrigation sleeves. Temporary PVC caps shall be placed at both ends of sleeves.

Coordinate irrigation sleeve installation with landscape planting and other site work.

Maintain 24-inches of cover above sleeves at paved surfaces.

D Measurement
The department will measure Irrigation Sleeve (Size) 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.0090.1011	Irrigation Sleeve, 2-Inch	LF
SPV.0090.1012	Irrigation Sleeve, 3-Inch	LF
SPV.0090.1013	Irrigation Sleeve, 4-Inch	LF

Payment is full compensation for furnishing and installing the irrigation sleeve and related appurtenances according to the plans.

160. Irrigation Main Line, 1.5-Inch Dia., Item SPV .0090.1014; Irrigation Main Line, 2-Inch Dia., Item SPV .0090.1015; Irrigation Zones – Drip, Item SPV 0165.1004; Irrigation Zones – Spray, Item SPV 0165.1005.

A Description
Design and install electric solenoid controlled irrigation system, with pressure blow out drain for areas shown on plans to irrigate all planting bed areas with drip line irrigation. Provide initial water for landscaped areas at a rate of 1 inch per week.

Each water zone will have a municipal service connection installed under separate bid item. The service will be as follows: service #1 will be a 2-inch tap with 3-inch diameter copper mainline and service #2 will be a 2-inch tap with 2-inch diameter copper mainline, with available static pressure of 72 psi for both service connections.

Refer to irrigation service and irrigation plans. Piping shall be rated at 100 psi for Polyethylene or 200 psi for Poly Vinyl Chloride minimum. Provide isolation valves for each lawn/planting bed area, for each planting area separated by paving. battery powered controllers shall be used. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction. System Control shall be Toro DDCWP-9V series unit controllers to be installed in existing irrigation service vaults.

Weather Sensor: Hunter Rain-Clik to be installed on each controller; one per controller. Mount weather sensor on enclosure. Low Voltage Controls: 24 volts. Provide maintenance/service for irrigation system for one year after substantial completion to include one system start-up and one system shutdown. This includes winterization blowout.

Contractor shall be responsible for locating the existing irrigation sleeves installed during the roadway project prior to submitting an irrigation design for approval by the landscape architect.

B Materials

B.1 Mainline Pipe Materials and System Appurtenances

Piping shall be from virgin parent material and shall be homogeneous throughout and free from visible cracks, holes, foreign materials, blisters, deleterious wrinkles and dents. Pipe shall be National Sanitation Foundation (NSF) approved.

Piping on high-pressure side of solenoid control valves (main), shall be Polyvinyl Chloride (PVC) 1120 with a minimum class rating of 200 psi, SDR-21.

> Pipe shall be marked at intervals (not to exceed 5 feet) with following information: Manufacturer's name or trademark, nominal pipe size, schedule, PVC type and grade (i.e., PVC 1120), SDR rating class, working pressure at 73 degrees F. and (NSF) approval.

Piping on low pressure side of solenoid control valves (laterals) shall be polyethylene (PE) with a minimum class rating of 100 psi.

> Polyvinyl Chloride (PVC) 1120 with a minimum class rating of 200 psi, may be freely substituted for the specified polyethylene pipe.

Piping used as Sleeve Material shall be Polyvinyl Chloride (PVC) 1120, Schedule 40 rating. Sleeve pipe and wire separately. Minimum wire sleeve to be 2-inches. Pipe sleeve to be two times the size of pipe being sleeved.

B.2 Fittings

Fittings shall be from virgin parent material and shall be homogeneous throughout and free from visible cracks, holes, foreign materials, blisters, deleterious wrinkles and dents. Fittings shall be National Sanitation Foundation (NSF) approved.

Fittings approved for use at this project shall bear NSF approval as manufactured by one of the following:

Lasco	(714) 993-1220
Spears	(818) 364-1611
Or equal.	

Usage:

1. Fittings specified for use on high-pressure side of solenoid control valves shall be PVC, Schedule 40.
2. Fittings specified for use on low-pressure side of solenoid control valves shall be PVC Schedule 40 pipe.
3. All threaded PVC shall be Schedule 80 pipe.
4. Insert fittings specified for use with polyethylene pipe shall be Type 1 PVC, Schedule 40.

Solvent used for PVC pipe shall bear NSF approval, and shall be Weld-on #705, as manufactured by:

Industrial Polychemical (212) 321-6515
Or equal.

Hose clamps used for PE pipe shall bear NSF approval and shall be stainless steel bands with stainless steel hex-head or irrigation crimp clamps screws as manufactured by:

Murray Corporation (301) 771-0380
Or equal.

B.3 Shut-Off Valves
Shut-off valves shall be bronze double-disc wedge type gate valves, with integral taper seats and non-rising stems (same size as line), as manufactured by:

Milwaukee Valve (414) 744-5240
Or equal.

B.4 Quick Couple Valves
Quick Couple Valves shall be furnished with one valve key and fitted with 3/4-inch swivel hose ells.

Quick Couple Valves to be Toro 075:SLSC or equal. Quick Coupe Valves to be mounted on a triple joint swing joint.

B.5 Valve Boxes
Valve boxes and covers shall be molded of green temperature resistant thermoplastic materials suitable for enclosing main and lateral valves as detailed, as manufactured by:

Ametek Inc. (414) 457-9435
Or equal.

Use 10-inch round valve box for all isolation valves and single electric valves. Use 12-inch rectangular valve boxes for two or more electric valves in one location.

B.6 Drip Irrigation
Drip Line and Integral Drip Line Components: Drip line shall be pressure compensating continuous self-cleaning drip line, Netafim Techline with check valve spaced at 24 inches on center with CV 0.6 GPH @12 inch emitter spacing, (drip line to be traced with metal tracing wire) as manufactured by Netafim Techline or equal.

Drip zones shall be manifolded where possible. Use an air releaser/vacuum valve at all high points. All ends of drip zones shall have a manual flush valve. Place both in 6-inch round valve boxes.

B.7 Sprinkler Heads
All sprinkler heads shall be Rain Bird Spray Head 1800 series with check valves. A pop-up sprinkler shall be capable of covering a 15-foot radius at 30 psi. Use 6-inch high pop up sprinklers in turf areas.

The sprinkler body, stem, nozzle and screen shall be constructed of heavy duty, ultra-violet resistant plastic. It shall have a heavy duty stainless steel retract spring for positive pop-down and a ratcheting system for easy alignment of the pattern. The sprinkler shall have a soft elastomer pressure-activated co-molded wiper seal for cleaning debris from the pop-up system as it retracts into the case to prevent the sprinkler from sticking up to minimize "flow-by'.

The sprinkler shall have a matched precipitation rate (MPR) plastic nozzle with an adjusting screw callable of regulating the radius and flow. The sprinkler shall be capable of housing protective, non-clog filter screens or pressure compensating screens (PCS) under the nozzle. The screen shall be used in conjunction with the adjusting screw for regulating.

MP Rotator nozzles shall be installed on 1800 bodies where required and /or shown on plans. MP nozzles to be mounted on 1800 SAM-P45 bodies.

The sprinkler shall have a pop-top flush plug preinstalled. The plug shall prevent debris from clogging the sprinkler during installation and allow for the system to be flushed before nozzling. The plug shall be bright orange in color and constructed of polypropylene material.

B.8 Controls And Control Valves
Electric Remote Control Valves – each valve shall the ToroEZ Flo Series with DC Latching Solenoid model EZF-26-94. The diaphragm assembly shall be of rubber construction to retain flexibility and provide maximum sealing throughout its area. Use a drip "Y" filter with 150 mesh on zones feeding drip zones.

Controller Equipment: Toro DDCWP-9-V, 8 Station Controllers:

The controller shall be operated using two 9 volt batteries, and operate one latching solenoid per station and one latching solenoid –equipped master valve. Controller shall have three independent programs and three start times per program. Controller station run times shall support 1 minute to 4 hours intervals in 1 minute increments, and permit seasonal adjustment by month from 0-200% in 10% increments. The controller shall also permit manual operation by station or program, and programmable master valve

Controller shall have program review feature, self-diagnostic circuit breakers to bypass short circuited stations, and five year-program retention with on board coin battery to save the time of day and all programming features. Place controller in a stainless steel enclosure

located within planting beds as identified in the plans. Use controller SG-Ajr 18" wide x 11" deep x 35" high by Lemeur or equal.

Master Valves: Toro Series Brass Valve (Model 220-27-04) with DCLS-Potted DC latching solenoid assembly.

The master valve shall be Ingot Brass and stainless steel construction and shall be a globe configuration with a 2-inch female pipe thread inlet and outlet connections. The diaphragm assembly shall be fabric-reinforced rubber have a manual flow control adjustable to zero flow; manual internal bleed; removable, self-flushing, contamination proof stainless steel filter screen; Tri-act 3-way actuator.

Wire Conductors: Color coded, copper conductor, direct burial type.

B.9 Electrical Control Wiring
Electrical Characteristics: In accordance with Division 26, National Electrical Code, and irrigation system manufacturer's requirements.

Wiring specified for low voltage solenoid valve operations shall be in compliance with local electrical codes, and UL approved for direct burial applications.

Solid copper wiring of varying color insulation shall be minimum 14 gauge, sized per current draw at longest run. Color coordinate wire runs with 4 colored wires. All one color for 24v wiring is not allowed.

Common ground wire shall be white insulated, 14 gauge.

Wire splicing is permitted at intervals of 400 linear feet or greater, utilizing UL approved direct bury splice kit with gel-filled reservoir as manufactured by:

3M #DBY 512-984-5657

Use 3M DBY connectors for wire to electric valves.

B.10 Pipe Location Materials
Mark all non-conductive lateral pipes with a locating wire system.
Locating wire system consists of the following:

1. Tracer Wire: 45-mil solid copper, No. 12 HMW-PE yellow jacket coating. Install to enable electronic locating of underground utility.
2. Tracer Wire Locating Box: 2-1/2-inch diameter, minimum, ABS pipe with 2 point terminal box and cast iron cover. Manufacturer: Valco, Inc. Model C.P. Mini Box, or an approved equal.

B.11 Winterizing Connection
A quick connect air hose connection of approved design will be required at the point of connection after the RPZ so that the entire system can be drained by blowing it out with compressed air.

C Construction
Verify location of existing utilities before beginning work.

Verify required utilities are available, in proper location, and ready for use.

1. Irrigation contractor shall carefully schedule his work with landscape contractor and other site developments.

Layout irrigation equipment accurately to represent approved Shop Drawings.

Sleeves are required wherever piping or electrical wires are placed under paved surfaces. Sleeves to be installed under separate bid item.

Full and complete coverage is required. Contractor shall make any necessary minor adjustments to layout as required to achieve full coverage of irrigated areas at no additional cost to owner. The system shall not exceed 5 fps velocity through piping system. Shop drawings to indicate all pipe sizing, zone run times, water window, and the city water restrictions that the system was designed to meet. The system should be designed to apply 1.5 inches per week.

Contractor shall be responsible to establish location of sprinkler heads in order to assure proper coverage of all areas. In no case shall spacing of sprinkler heads exceed distances shown on Drawings. Pipe sizes shall conform to those shown on Drawings. Pipe damaged or rejected because of defects shall be removed from site at time of said rejection.

Install irrigation system after completion of site grading, irrigation system shall be installed and completely operational three days prior to installation of any planting operations.

POINT OF CONNECTION
Contractor to verify that adequate gpm and psi are available at irrigation supply points of connection.

TRENCHING
Perform excavations as required for installation of work included under this section, including shoring of earth banks, if necessary. Restore surfaces and existing underground installations that may become damaged.

Should utilities not shown on Drawings be found during excavations, contractor shall promptly notify owner's construction representative for instructions as to further action. Failure to do so will make contractor liable for any and all damage thereto arising from his

operations subsequent to discovery of such utilities. Indicate such utility crossings on Record Drawings promptly.

Trenches shall be open, vertical sided construction wide enough to provide free working space around work installed and to provide ample space for backfilling and compacting.

When two pipes are to be placed in the same trench, maintain a 6-inch space between pipes. Contractor shall not install two pipes with one directly above the other.

Backfill trenches with No. 2 Stone as specified in standard spec 652, and compact in layers to 95 percent modified Proctor density.

Depth of trenching shall be sufficient to protect finished buried services, whereas the following minimum cover is required:

1. 12 inches above lateral piping.
2. 18 inches above main supply piping.
3. 18 inches above low-voltage wiring.
4. 24 inches above sleeves at paved surfaces.

PIPE INSTALLATION

Install plastic and Polyethylene pipe and fittings in a manner so as to provide for expansion and contraction as recommended by manufacturer.

Clean pipes and fittings of dirt, burrs, and moisture prior to assembly.

Pipe, fittings, valves, etc., shall be carefully placed in trenches. Keep interior of pipes free from dirt and debris and when pipe laying is not in progress, close open ends of pipe by approved means.

Polyvinyl chloride piping may be pulled with vibrator plow.

Make lateral connections to mainline as well as other connections to side of pipes. No connections to top of pipe shall be allowed.

Connections and joint of PVC and PE pipe shall be performed as specified by manufacturer.

1. Solvent weld products for PVC pipe is listed in specification. Enlarged view detail is provided on Irrigation Detail sheet.
2. Threaded joints for PVC pipe shall be permitted with Schedule 80 pipe only.
    a. Use Teflon tape on threaded PVC fittings.
    b. Use strap-type friction wrench only. Do not use metal-jawed wrench.
    c. When connection is plastic to metal, male adaptors shall be used. Male adaptor shall be hand tightened, plus one turn with a strap wrench.

3. Hose clamp products for PE pipe are listed in specification. Enlarged view detail is provided on Irrigation Detail sheet.
    a. Double clamp all connections 1-1/4-inch diameter and greater.
    b. Make connections between polyethylene pipes and metal valves or pipes with threaded fittings using male adaptors.

Laying of Pipe:

1. Cut PVC pipe with pipe cutters or hacksaw in a manner so as to ensure a square cut. Remove burrs at cut ends prior to installation so that a smooth unobstructed flow will be obtained.
2. Plastic to plastic joints will be solvent-weld joints. Install plastic pipe and fittings as outlined and instructed by pipe manufacturer.
3. Install PVC pipe and fittings in a manner so as to provide for expansion and contraction as recommended by manufacturer.
4. Do not lay PVC pipe when there is water in trench.
5. Snake PE pipe from side to side of trench bottom to allow for expansion and contraction. Four (4) additional feet per 100 feet of pipe is minimum allowance for snaking.

Thrust Blocks:

1. Provide brick/concrete thrust blocks on thrust side of PVC pipe wherever pipe line:
    a. Changes direction, as at tees or bends.
    b. Dead ends.
    c. Any other spot where thrust is to be expected.
2. A complete example of thrust block locations is provided on Irrigation Detail sheet.

VALVE INSTALLATION

Install valves as near as possible to positions indicated on drawings consistent with conveniences of operating the wrench. Valves shall be carefully erected and supported in their respective positions free from distortion and strain or appurtenances during handling and installation. Material shall be carefully inspected for defects in workmanship and material, debris and foreign material cleaned out of valve openings and seats, operating mechanisms operated to check their proper functioning, and nuts and bolts checked for tightness. Valves and other equipment which do not operate easily or are otherwise defective shall be repaired or replaced at contractor's expense. Set valves plumb and support adequately in conformance with instructions of manufacturer. Valves are to be located, as best as possible, to be concealed from view.

Install valve boxes on a suitable base of Number 2 stone for proper foundation of box and easy leveling of box to proper grade and to provide proper drainage of access box. Provide valve boxes with proper length and size extensions, wherever required, to bring valve

boxes level with finished grade or 1-inch above when sited within ground cover and shrub bed areas.

Shut-off Valves:

1. Bronze gate valves as shut-off valves, enclosed within valve box.

Solenoid Station Valves:

1. Install control valves in existing irrigation service vaults.
2. Pressure regulating control valves shall be adjusted so that most remote sprinkler heads operate at pressure specified.
3. Install valves according to manufacturer's instructions and specifications.

Quick Coupling Valves:

1. Set quick coupling valves a minimum of 12 inches from walks, curbs, or paved areas where applicable or as otherwise noted. House quick coupling valves in same valve box with station valve.
2. Install valves on a three elbow PVC Schedule 80 swing joint assembly.

SPRINKLER HEADS
Set sprinkler heads and quick coupling valves perpendicular to finished grades unless otherwise designated on Drawings, or otherwise specified. Set sprinkler heads adjacent to existing walls, curbs and other paved areas, to grade. Set sprinkler heads which are to be installed in lawn areas where turf has not yet been established 1-inch above proposed finish grade. Heads installed in this manner will be lowered to grade when turf is sufficiently established to allow walking on it without appreciable destruction. Such lowering of heads shall be done by this contractor as part of original contract with no additional cost to owner.

Sprinkler heads shall be Rain Bird Spray Head 1800 series or approved equal.

DRIPLINE INSTALLATION
Install drip line on top of finished grade, just below mulch, with soil clamps.

Place drip line a minimum of 2 feet away from building walls and foundations.

Locate drip line as shown on Drawings based on soil conditions, plant material locations, and designed precipitation rates.

Trace drip line pipes and accessories with tracer wire.

CONTROLLER INSTALLATION
Install automatic controller in stainless steel enclosure.

Connect solenoid station valves to controller in sequence to correspond with station setting beginning with Stations 1, 2, 3, and so on.

Important: It is the landscape contractor's responsibility to determine water application rates and timer cycling. Irrigation contractor will instruct landscape contractor on operation and programming of controller and will assist landscape contractor as necessary in such operations throughout the one year maintenance period. Any adjustments, repairs, other than programming are responsibility of irrigation contractor.

CONTROL WIRING

Electrical equipment and wiring shall comply with local and state codes and be installed by those skilled and licensed in the trade.

Wiring shall occupy same trench and be installed along same route as main supply or lateral piping wherever possible, and shall have a minimum of 18-inches cover.

Install control wires to side of main line whenever possible. Placement over pipes is not permitted.

Where more than one wire is placed in a trench, tape wiring together at intervals of 20 feet.

Provide an expansion curl within 3 feet of each wire connection and at least every 100 feet of wire length on runs of more than 100 feet in length. Form expansion curls by wrapping at least 5 turns of wire around a 1-inch diameter pipe, then withdrawing pipe.

Control wire splices at remote control valves to be crimped and sealed with specified splicing materials. Line splices will be allowed only on runs of more than 400 feet and they must be located in 10-inch round splice boxes which are green in color. Connector shall be 3M#DBY splice kit.

Main line shall have six spare wires or multi conductor cable installed its entire length and to automatic controller. Label each end "not used."

FLUSHING THE SYSTEM

Thoroughly flush out water lines under a full head of water before installing heads, valves, quick coupler assemblies, etc. Maintain flushing for a minimum of 3 minutes at valve located furthest from water supply.

After flushing, cap or plug openings to prevent entrance of materials that would obstruct the pipe or clog heads. Leave in place until removal is necessary for completion of installation.

TESTING

Testing shall be done under the supervision of Construction Manager. Submit written requests for inspections to owner's construction representative at least three days prior to anticipated inspection date.

Make hydrostatic tests when welded PVC joints have cured as per manufacturer's instructions.

1. Pressurized Mains: In accordance with National Irrigation Association Standards.
2. Pressurized Laterals: In accordance with National Irrigation Association Standards.
3. Pressurized Drip Lines:
    a. Test piping after drip lines and accessories have been installed, but before being covered with mulch.

Upon completion of testing, complete assembly and adjust sprinkler heads and drip lines for proper distribution.

INSPECTION
Contractor shall maintain proper facilities and provide safe access for inspection to all parts of the work.

Irrigation inspection shall consist of a minimum of:

1. Mainline pressure test.
2. Coverage test.
3. Final irrigation inspection.

In all cases where specifications, Landscape Architect's instructions, laws, ordinances, or any public authority require any work to be specifically tested or approved by them, contractor shall give Landscape Architect three days' notice of its readiness for inspection.

Contractor shall be solely responsible for notifying owner's construction representative where and when such work is in readiness for testing.

No inspection will commence without accurate Record Drawings, without completing previously noted corrections, or without preparing system for inspection.

BACKFILLING AND COMPACTION
After system is operating and required tests and inspections have been made, backfill excavations and trenches.

Backfill for all trenches, regardless of type of pipe covered, shall be compacted to minimum 95 percent modified Proctor density under pavements, 85 percent modified Proctor density under planted areas.

Backfill material shall be approved soil. Unsuitable material, including clods and rocks over 2 inches in size shall be removed from site.

Place a fine granular material initially on all lines with a minimum of 3 inches cover. No foreign matter larger than 1/2-inch in size shall be permitted in initial backfill.

Backfill trenches located under paving with No. 2 Stone. Compacted in layers to 95 percent modified Proctor density.

Compact trenches in areas to be planted, by thoroughly flooding backfill through use of adjacent Quick Coupling Valves.

Within planting and lawn areas, restore existing 6 inches of topsoil and re-establish finish grade.

Contractor shall dispose of surplus earth on site and #2 stone remaining after backfilling at an off-site location.

ADJUSTING
Adjust control system to achieve time cycles required.
Change and adjust head types for full water coverage.

DEMONSTRATION AND TRAINING
Instruct owner's personnel in operation and maintenance of system, including adjusting of sprinkler heads. Use operation and maintenance material as basis for demonstration.

D Measurement
The department will measure Irrigation Main Line (Size) Dia installed by the linear foot, acceptably completed.

The department will measure Irrigation Zones – Drip and Irrigation Zones – Spray by the square foot unit of work for the construction of the irrigation zones and related appurtenances, 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.0090.1014	Irrigation Main Line, 1.5-Inch Dia.	LF
SPV.0090.1015	Irrigation Main Line, 2-Inch Dia.	LF
SPV.0165.1004	Irrigation Zones - Drip	SF
SPV.0165.1005	Irrigation Zones - Spray	SF

Payment is full compensation for furnishing and installing the irrigation system and related appurtenances according to the plans.

161. Ornamental Picket Fence 6-FT HT, Item SPV.0090.1016; Removable Ornamental Picket Fence 6-FT HT, Item SPV.0090.1017.

A Description

This special provision describes furnishing and installing 6-foot high ornamental picket fence according to the dimensions, elevations and details as shown on the drawings and provided in the contract.

Fence and gate design shall match the existing Summerfest 6-ft high ornamental picket fencing as closely as possible. Ornamental picket fencing details and specifications below have been provided by Summerfest for reference and to show general design intent. Contractor shall field-verify and match all existing fence and gate members, sizes, hardware, spacing, gage, color, finish, and styles with new fencing. Contact Robert Gosse, Director of Design and Construction, Milwaukee World Festival, Inc., 200 N. Harbor Drive, Milwaukee, WI 53202, Office: (414) 287-4466 to coordinate matching the existing Summerfest fencing.

B Materials

Ornamental picket fence manufacturer shall be Merchants Metals Guardsman® Houston, Texas 77032, (866) 888-5611 or (866) 888-5611, tech-info@merchantsmetals.com or approved equal. Picket fences and gates must be obtained from a single source.

Pickets: Galvanized 1" square steel tubular members with crimped tops, manufactured per ASTM A-924/A-924M, having a 45,000 psi yield strength and hot-dip galvanized per ASTM A653/A653M with a G90 zinc coating, 0.90 oz/ft2. Attach each picket to each rail with 1/4" industrial drive rivets. Minimum gauge wall thickness shall be 16 gauge.

Rails: 1-1/2" x 1-3/8" x 1-1/2", 11 gauge 0.120" thick galvanized steel "U" channel per ASTM A- 653/A-653M, having a 50,000 psi yield strength and G90 zinc coating, 0.90 oz/fl2. Punch rails to receive pickets and rivets and attach rails to rail brackets with 2 each, 1/4" industrial drive rivets.

Posts: Galvanized steel tube, galvanized inside and outside, produced per ASTM A-653/653M -G90 zinc coating, 0.90 oz/fl2, steel to have 45,000 psi yield strength. Post size shall be 3" x 3" square. Posts to have 12 gauge wall thickness.

Finish: All primary components receive a thorough cleaning and pre-treatment; this 10-step process shall be performed after all welding is completed and consists of:

1. Hot alkaline cleaner
2. Clear water rinse
3. Hot iron phosphate application
4. Clear water rinse
5. Reverse Osmosis rinse
6. Dry off oven heat at 425° F
7. Zinc enriched powder primer coat at 2-4 mils.

8. Gel oven heat at 400° F
9. Ultra polyester finish T.G.I.C. powder coat at 2-4 mils.
10. Final curing oven at 450° F

Color: Black.

Accessories:
Industrial drive rivets hold pickets to rails and rails to brackets. Rivets must have a sheer strength of 1,500# (6674 N) and a holding power of 1,100# (4894 N).

Rail/Post Brackets: Die cast of zinc (ZAMAK #3 alloy) per ASTM B86-83Z 33521. Designed to angle up to 30° (up/down or left/right) to accommodate changes in grade or direction. Bracket to have cover for complete security (NO SUBSTITUTION) Cover to be riveted to bracket for permanent installation. (Minimum sheer strength 3,000 lbs. and holding power 2,200 lbs.)

Post Caps: Cast aluminum or malleable iron or formed steel manufactured to form a weather-tight closure. Caps to be flat-top style on all posts.

Shop Drawings: Indicate the following on detailed plan layout and cross sections: dimensions, color, finish, style, size and spacing of components, post foundation dimensions, hardware anchorage, gates and moving parts, and schedule of components. Submit to engineer for written approval prior to construction.

Product Data: Submit data on characteristics on pickets, rails, posts, accessories, fittings and hardware, including warranties. Submit to engineer for written approval prior to construction.

Warranty: Provide manufacturer's standard limited warranty that its ornamental fence system is free from defects in material and workmanship including cracking, peeling, blistering and corroding for a minimum period of 15 years from the date of purchase.

C Construction
Construct ornamental picket fence according to selected ornamental picket fence manufacturer's written instructions. Coordinate construction for the excavation of the ornamental picket fence foundations according to standard spec 206. Verify and provide concrete post foundation mix is according to standard spec 501.

Clean up all construction-related debris and remove from site.

D Measurement
The department will measure Ornamental Picket Fence 6-FT HT and Removable Ornamental Picket Fence 6-FT HT by the linear foot measured along the top of rail, 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.0090.1016	Ornamental Picket Fence 6-FT HT	LF
SPV.0090.1017	Removable Ornamental Picket Fence 6-FT HT	LF

Payment is full compensation for providing ornamental picket fence, concrete foundations, and for excavation and removal of existing soils.

162. Double Swing Gate with 12-FT Opening, Item SPV.0090.1018; 16-FT Opening, Item SPV.0090.1019.

A Description

This special provision describes furnishing and installing double swing gate with 12-ft opening and double swing gate with 16-ft opening according to the dimensions, elevations and details as shown on the drawings and provided in the contract.

Swing Gate design shall match the existing Summerfest 6-ft high ornamental picket fencing as closely as possible. Swing Gate details and specifications below have been provided by Summerfest for reference and to show general design intent. Contractor shall field-verify and match all existing fence and gate members, sizes, hardware, spacing, gage, color, finish, and styles with new fencing. Contact Robert Gosse, Director of Design and Construction, Milwaukee World Festival, Inc., 200 N. Harbor Drive, Milwaukee, WI 53202, Office: (414) 287-4466 to coordinate matching the existing Summerfest swing gates.

B Materials

Ornamental picket fence manufacturer shall be Merchants Metals Guardsman® Houston, Texas 77032, (866) 888-5611 or (866) 888-5611, tech-info@merchantsmetals.com or approved equal. All swing gates must be obtained from a single source.

Gate Frame: Ornamental picket swing gate frames to be fabricated of galvanized steel tubing. ASTM A-924/A-924M, of structural steel having a 45,000 psi (310 MPa) tensile strength and a G90 (0.9 oz/ft2) zinc coating. Members to be welded with stainless steel rods, forming a rigid one piece unit. (No Substitution) Vertical upright members 2" sq. 14 ga. 0.080" metal thickness.

For gate leaves up to 8'-0", horizontal rails to be "U" channels, formed of hot rolled, structural steel 1- 3/8" wide by 1-1/2" high, 11 gauge 0.120" metal thickness. Rails must be punched to receive pickets and rivets. Rails stainless steel welded inside vertical members. Pickets are galvanized steel 1" to match Ornamental Picket Fence sections. Pickets shall be attached to "U" channels using 1/4" industrial drive rivets.

Hardware:

Use galvanized steel and or malleable steel to suit gate application. Latch shall have provision for padlocking. Hinges shall grip post and frame firmly to prevent slippage.

Hinges shall have a load capacity of 1,000 lbs. Hinges shall allow gate leaf to swing 180° (3.14 rad).

Gate keepers shall be provided to hold gate in open position.

Gate Truss Cable: Diagonal adjustable 1/4" stainless steel truss cables shall be provided as shown on fence details.

Gate Posts: 4" Square gate posts (ASTM A-924/A-924M) 45,000 psi (MPa) tensile strength with G90 galvanized coating in sizes shown below.

Finish: All primary components receive a thorough cleaning and pre-treatment; this 10-step process shall be performed after all welding is completed and consists of:

1. Hot alkaline cleaner
2. Clear water rinse
3. Hot iron phosphate application
4. Clear water rinse
5. Reverse Osmosis rinse
6. Dry off oven heat at 425° F
7. Zinc enriched powder primer coat at 2-4 mils.
8. Gel oven heat at 400° F
9. Ultra polyester finish T.G.I.C. powder coat at 2-4 mils.
10. Final curing oven at 450° F

Color: Black.

Shop Drawings: Indicate the following on detailed plan layout and cross sections: dimensions, color, finish, style, size and spacing of components, post foundation dimensions, hardware anchorage, gates and moving parts, and schedule of components. Submit to engineer for written approval prior to construction.

Product Data: Submit data on characteristics on pickets, rails, posts, accessories, fittings and hardware, including warranties. Submit to engineer for written approval prior to construction.

Warranty: Provide manufacturer's standard limited warranty that its swing gate system is free from defects in material and workmanship including cracking, peeling, blistering and corroding for a minimum period of 15 years from the date of purchase.

C Construction

Construct swing gates according to selected ornamental picket fence manufacturer's written instructions. Coordinate construction for the excavation of the ornamental picket fence foundations according to standard spec 206. Verify and provide concrete post foundation mix is according to standard spec 501.

Attach all hardware to gate in such a way that it cannot be removed by any unauthorized persons.

D Measurement
The department will measure Double Swing Gate with (Length) Opening by the linear foot measured along the top of rail, 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.0090.1018	Double Swing Gate with 12-FT Opening	LF
SPV.0090.1019	Double Swing Gate with 16-FT Opening	LF

Payment is full compensation for providing double swing gate with opening, shop drawings, concrete foundations; and for excavation and removal of existing soils.

163. Sliding Gate, 24-FT Opening, Item SPV.0090.1020.

A Description
This special provision describes furnishing and installing sliding gate, 24-ft opening according to the dimensions, elevations and details as shown on the drawings and provided in the contract. Sliding Gate design shall match the existing Summerfest Sliding Gate with 24’ opening as closely as possible. Sliding Gate drawing details have been provided by Summerfest for reference and to show general design intent. Contractor shall field-verify and match all existing fence and gate members, sizes, hardware, spacing, gage, color, finish, and styles with new fencing. Contact Robert Gosse, Director of Design and Construction, Milwaukee World Festival, Inc., 200 N. Harbor Drive, Milwaukee, WI 53202, Office: (414) 287-4466 to coordinate matching the existing Summerfest sliding gates.

B Materials
Ornamental picket cantilever slide gate with internal rollers – manual operation.

Sliding Gate manufacturer shall be Merchants Metals Guardsman® Houston, Texas 77032, (866) 888-5611 or (866) 888-5611, tech-info@merchantsmetals.com or approved equal. Sliding gates must be obtained from a single source.

Gate Frame: ASTM F 1183 Type II Class 2, Gate to be made of Aluminum Alloy 6005-T61. All square members are 2" sq. weighing 0.94 lb/FT. Complete frame welded to top (HI-STRENGTH) one piece track and top frame member and 4" x 2" bottom rail weighing 1.71 lbs./ft. Supply 2 truck assemblies that are swivel type having lubricated and scaled ball bearing wheels that will align in the track during all normal operations of the gate.

Interior Horizontal Rails: Aluminum "U" channels - 1-3/8" wide x 1-1/2" high, 11 gauge 0.120" metal thickness. Rails must be punched to receive pickets and rivets. Rails welded inside vertical external uprights. Picket size and style to match Ornamental Picket Fence

6-FT HT style. Pickets shall be riveted to "U" channel using 1/4" industrial drive rivets. Pickets to be welded to exterior horizontal members.

Bracing: Provide diagonal adjustable length stainless steel truss cables to prevent sagging. One cable in each direction per 8' maximum of gate length.

Secure Trac® is an enclosed (HI-STRENGTH) combination track and top rail aluminum extrusion weighing 4.75 lb/ft. It will withstand a 2,000 lb reaction load.

Truck assembly is a swivel type with a galvanized steel base unit and four lubricated and sealed ball bearing rollers. Each roller is 2" in diameter and 9/16" in width, (each wheel has an extruded dynamic load rating of 4250 lbs). The truck shall have 2 galvanized steel side rollers to assure alignment in track. Truck assemblies are held to post brackets using a 5/8" stainless steel bolt which has a static radial load rating of 11,000 pounds. The truck assembly shall withstand 2,000 lb reaction load.

Gate post brackets, latch and keepers shall be galvanized steel.

Gate posts are 4" sq. weighing 5.77 lb/ft.

Single gates with single tracks require 3 gate posts (1 latch post and 2 support posts)

Finish: All primary components receive a thorough cleaning and pre-treatment; this 10-step process shall be performed after all welding is completed and consists of:

1. Hot alkaline cleaner
2. Clear water rinse
3. Hot iron phosphate application
4. Clear water rinse
5. Reverse Osmosis rinse
6. Dry off oven heat at 425° F
7. Zinc enriched powder primer coat at 2-4 mils.
8. Gel oven heat at 400° F
9. Ultra polyester finish T.G.I.C. powder coat at 2-4 mils.
10. Final curing oven at 450° F

Color: Black.

Shop Drawings: Indicate the following on detailed plan layout and cross sections: dimensions, color, finish, style, size and spacing of components, post foundation dimensions, hardware anchorage, gates and moving parts, and schedule of components. Submit to engineer for written approval prior to construction.

Product Data: Submit data on characteristics on pickets, rails, posts, accessories, fittings and hardware, including warranties. Submit to engineer for written approval prior to construction.

Warranty: Provide manufacturer's standard limited warranty that its sliding gate system is free from defects in material and workmanship including cracking, peeling, blistering and corroding for a minimum period of 15 years from the date of purchase.

C Construction

Coordinate installation of sliding gate with installation of Masonry Columns, 8-FT HT and according to manufacturer's written instructions. Make sure that finished gate rolls free of binding. Attach latch and make sure that gate is received by latch in a secure manner. Coordinate construction and excavation for the steel tube column foundations according to standard spec 206. Verify and provide concrete post foundation mix is according to standard spec 501.

Clean up all construction-related debris and remove from site.

D Measurement

The department will measure Sliding Gate, 24-FT by the linear foot measured along the top of rail, 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.0090.1020	Sliding Gate, 24-FT	LF

Payment is full compensation for providing sliding gate, shop drawings, concrete foundations; and for excavation and removal of existing soils.

164. Chain Link Fence, Temporary 6-FT Delivered, Item SPV.0090.1021.

A Description

This special provision describes furnishing and delivering temporary construction fencing and gates according to standard spec 616 and as hereinafter provided.

B Materials

Provide a 6' high temporary chain link fence with materials conforming to standard specification 616.2.3 with the following exceptions:

- Used/salvaged fencing materials are acceptable.
- Determine post size, bracing, and hardware requirements with consideration for wind loading due to the privacy screening.
- Portable free standing chain link fence panels may be used.

C Construction
Deliver temporary chain link construction fence to the locations shown on the plans or as directed by the engineer prior to beginning work operations. Deliver gates and openings of size and location required by contractor's operations.

D Measurement
The department will measure Chain Link Fence, Temporary 6-FT Delivered in length 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.0090.1021	Chain Link Fence, Temporary 6-FT Delivered	LF

Payment is full compensation for furnishing and delivering the 6-FT high temporary chain link construction fencing to the project site; including all security gates and accompanying hardware necessary to provide contractor access to the protected work site.

165. Chain Link Fence, Temporary 6-FT Installed, Item SPV.0090.1022.

A Description
This special provision describes, erecting, moving, maintaining and removing temporary construction fencing and gates according to standard spec 616 and as hereinafter provided.

B Materials
Install a 6' high temporary chain link fence with materials conforming to standard spec 616.2.3 with the following exceptions:

- Used/salvaged fencing materials are acceptable.
- Determine post size, bracing, and hardware requirements with consideration for wind loading due to the privacy screening.
- Portable free standing chain link fence panels may be used.

C Construction
Erect Chain Link Fence, Temporary 6-FT at the locations shown on the plans or as directed by the engineer prior to beginning work operations. Provide gates and openings of size and location required by contractor's operations. Close and secure all gates and openings when not in use. Maintain the temporary chain link fence for the duration of the project and within four hours of any damage.

D Measurement
The department will measure Chain Link Fence, Temporary 6-FT Installed in length 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.0090.1022	Chain Link Fence, Temporary 6-FT Installed	LF

Payment is full compensation for erecting the fencing, maintaining and repairing the fence, for providing secure gates and openings, for moving and adjusting the fencing during construction, and for removing and disposing of the fence upon contract completion. No measurement or payment will be made for removing and disposing of fence.

166. 10-Inch Diameter Sanitary Lateral, Item SPV.0090.1023.

A Description

Work under this item consists of furnishing and installing 10-inch Dia. Sanitary Laterals according to the Standard Specifications for Sewer and Water Construction in Wisconsin Sixth Edition (Standard Specifications), and as shown on the plans and as follows.

B Materials

The contractor is to furnish polyvinyl chloride (PVC) pipe, Standard Dimensional Ration (SDR) 35. PVC pipe and fittings shall conform to the requirements of Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings, ASTM D3034. Joint connections shall include gaskets as recommended by the manufacturer.

C Construction

Connect the sanitary lateral to the existing main according to Section 5.3.0 of the Standard Specifications. Make all sanitary lateral connections with a proper wye or tee fitting. The contractor shall not core into the existing the sanitary lateral without written approval from the City of Milwaukee Utility Coordinator.

The contractor shall protect and support all the existing utilities during the sanitary lateral work.

The standard grades shall be a uniform rise of one inch in four feet (pitch = ¼ inch per foot) for building sanitary and combined sewers and a uniform rise of one inch in eight feet (pitch = ⅛ inch per foot) for building storm sewers.

The minimum grade for building sewers shall be a uniform rise of one inch in eight feet (pitch = ⅛ inch per for foot) for building sanitary and combined sewers and one inch in 16 feet (pitch = 1/16 inch per foot) for building storm sewers.

The minimum grade shall be used only when specified in the contract documents or with the approval of the commissioner.

Building sewers connected to main sewers shall begin at a 45º 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.

The standard depth for building sewers at the lot line shall be as follows: 9 ½ feet for building sanitary and combined sewers in residential areas; 11 ½ feet for building sanitary and combined sewers in industrial and commercial areas and 4 ½ feet for building storm sewers.

Install the sanitary lateral as specified in the plan details and according to trench widths specified in Section 5.2.0 of the Standard Specifications.

The contractor shall install a metallic tracer wire on non-metallic building sewer laterals per Section 2.11.0 of the Standard Specifications.

In addition to the allowable 1-1/2 inch graded aggregate, as per Table 39 of Section 8.43.7 of the Standard Specifications, the contractor is also allowed to use 1-1/4 inch graded aggregate. The 1-1/4 inch aggregate shall meet the Wisconsin Department of Transportation (WisDOT) standards, as per standard spec 305 dense graded base, conforming to the table listed as "percent passing by weight" in standard spec 305.2.2.1 General.

Removal of sidewalk, pavement, and curb and gutter that is required for the sanitary lateral installation will be paid under separate bid items.

D Measurement

The department will measure 10-Inch Diameter Sanitary Lateral 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.0090.1023	10-Inch Diameter Sanitary Lateral	LF

Payment is full compensation for providing, installing all pipe and fittings, protecting existing utilities, installing tracer wire, and providing backfill necessary to complete the sewer lateral connection with the existing sewer main.

167. Concrete Barrier Temporary Precast Left in Place, Item SPV.0090.1024.

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 according to the pertinent provisions of standard spec 603, these special provisions, and as hereinafter provided.

B Materials
Furnish Concrete Barrier Temporary Precast conforming to standard spec 603.2.

C Construction
Complete work according to standard spec 603.3. Maintain barrier until the contract is substantially complete.

D Measurement
The department will measure Concrete Barrier Temporary Precast Left in Place by the linear foot, acceptably completed, measured along the base of the barrier after final installation in its left-in-place location.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.1024	Concrete Barrier Temporary Precast Left in Place	LF

Payment is full compensation for providing, maintaining and leaving in place Concrete Barrier Temporary Precast; including any necessary anchoring and anchoring devices.

168. Conduit Reinforced Thermosetting Resin 1-Inch, Item SPV.0090.3001.

A Description
Furnish and install conduit reinforced thermosetting resin, as shown on the plans, and as hereinafter provided.

B Materials
Furnish materials that are according to the pertinent requirements of standard spec 652.2.4.

C Construction
Conform to applicable portions of standard spec 652.3.

D Measurement
The department will measure Conduit Reinforced Thermosetting Resin 1-Inch according to standard spec 652.4.(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.0090.3001	Conduit Reinforced Thermosetting Resin 1-Inch	LF

Payment is full compensation according to standard spec 652.5 (2).

169. Temporary Overhead Cable Quadruplex 4 AWG, Item SPV.0090.3002.

A Description

Furnish, install, and connect overhead cable complete with all splicing, identifications, terminations and guy wires at wood poles. The removal of the overhead cable shall be part of this pay item.

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	1.5	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.

The contractor may be permitted, upon the approval from the engineer to use previously used materials complying with specifications.

C Construction
Temporary overhead cable as shown on temporary lighting plans will not be needed for final lighting. Removal of temporary overhead cable is 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 of the contractor, the engineer may permit to reuse removed temporary overhead cable of ratings equivalent to the specified cable and of a type and condition approved by the engineer.

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 Temporary Overhead Cable Quadruplex (Type) in length by the linear foot in place 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.0090.3002	Temporary Overhead Cable Quadruplex 4 AWG	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.

170. 3#2/1#8 LTP Underground Street Lighting Cable, Item SPV.0090.3003; 3#4/1#8 LTP Underground Street Lighting Cable, Item SPV.0090.3004; 3#6/1#8 LTP Underground Street Lighting Cable, Item SPV.0090.3005.

A Description
Furnish and install service cable according to current City of Milwaukee Electrical methods and National Electrical Code standards.

B Materials
Unless otherwise specified, the cable to be furnished shall comply with the manufacture and test requirements of the Insulated Cable Engineers Association (ICEA) Specification No. S-61-402, NEMA WC5, latest revision.

CONDUCTORS: The conductors shall be of soft annealed copper wire according to ASTMB-3. Conductors No. 6 A.W.G. or larger shall be stranded. Conductors smaller than No. 6 A.W.G. shall be solid unless otherwise specified.

INSULATION:
600V: The insulation for cable rated 600V shall be thermo plastic according to applicable Paragraphs 3.7, 3.8 or 3.9 of ICEA Pub. No. S-61-402, latest revision, and shall be a nominal 60 mils. thickness. Insulation shall meet the ANSI/ASTM D2220-74 (latest revision) accelerated water absorption requirements and -30°C (-22°F) cold bend test.

Nominal Thickness: The nominal insulation thickness around each individual conductor shall be not less than 90% of the thickness specified in the schedule.

Color Code: The insulation compound which covers each conductor making up a cable shall be color coded in conformance with the N.E.M.A. Color Code Standard, unless otherwise specified; however, printed color designations as in I.3.2 or I.3.3. will not be acceptable under this specification (see schedule)

JACKETS:
Jacket: The jacket for all cables shall be moisture-resisting thermoplastic complying with the requirements for Paragraph 4.3.1. of ICEA Pub. No. S-61-402. The jacket shall have a gravimetric method maximum 30 mg./sq. in. water absorption.

The minimum average jacket thickness shall be not less than 80% of the thickness specified in the schedule.

The moisture-resisting thermo-plastic jacket shall provide a tough, durable covering of uniform thickness according to Paragraph 4.3. There shall be no fusing of insulation and jacket, so that the jacket may be easily separated from the core or insulation of individual conductors of multiple conductor cables.

ROUND CABLE:
All cables with conductor size #4 or larger, shall have non-hydroscopic fillers to provide a substantially round construction.

INSPECTION AND TESTS: Each length of the individual insulated conductor and completed cable shall comply with all requirements of I.C.E.A. Standards S-61-402. Sampling and Test Methods shall be according to Part 6. A certified report of the tests made on the cable to show compliance with this specification may be required prior to shipment. If requested, a sample of the cable covered by the report shall also be submitted.

POWER, CABLE SCHEDULE FOR SPECIFICATION

	3#2/1#8		3#4/1#8	
Size of Conductor	#2	#8	#4	#8
Number of Conductors	3	1	3	1
Number of Wires in Conductor	7 or 19	1	7 or 19	1
Type of Insulation	3 –PolyV Chlor PolyE	None	3- PolyV Chlor PolyE	None
Insulation Thickness	60 mils	None	60 mils	None
Insulation Voltage Rating	600 volt	None	600 volt	None
Insulation Color Code	1-white 1-black 1-red	None	1-white 1-black 1-red	None
Non-Hydroscopic Fill	Required		Required	
Moisture Resisting Sheath				
Jacket Thickness	60 mils		60 mils	

	3#6/1#8		3#8/1#8	
Size of Conductor	#6	#8	#8	#8
Number of Conductors	3	1	3	1
Number of Wires in Conductor	7	1	1	1
Type of Insulation	3-PolyV Chlor PolyE	None	3-PolyV Chlor PolyE	None
Insulation Thickness	60 mils	None	60 mils	None
Insulation Voltage Rating	600 volt	None	600 volt	None
Insulation Color Code	1-white 1-black 1-red	None	1-white 1-black 1-red	None
Non-hydroscopic Fill	None		None	
Moisture Resisting Sheath				
Jacket Thickness	60 mils		60 mils	

All conductors shall be uncoated annealed soft copper.

C Construction
The cable shall be installed in 2.5" P.V.C. Any turf damage during installation of cable shall be restored (grass, asphalt or concrete) by the contractor, All splices in luminaires and metal housings, must be completed by the contractor unless otherwise designated on plans.

D Measurement
The department will measure 3#(X)/1#8 LTP Underground Street Lighting Cable 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.0090.3003	3#2/1#8 LTP Underground Street Lighting Cable	LF
SPV.0090.3004	3#4/1#8 LTP Underground Street Lighting Cable	LF
SPV.0090.3005	3#6/1#8 LTP Underground Street Lighting Cable	LF

Payment is full compensation for providing service cable and for removal of construction debris and site restoration.

171. 2#12UF With Ground Street Lighting Riser Cable, Item SPV.0090.3006; 3#12UF With Ground Street Lighting Riser Cable, Item SPV.0090.3007.

A Description
Furnish and install type UF cable according to current City of Milwaukee Electrical methods and National Electrical Code standards.

B Materials
Furnish type UF cable with ground including the number and size of conductors as the plans show. Use cable conforming to ANSI/UL 493.

C Construction
Do not splice underground in pull boxes or conduit. Do not leave wire or cable ends uncovered or submerged in water. If the engineer observes this condition, the engineer may reject the entire length of cable or wire. Make all electrical connections and splices with approved pressure or compression type fittings.

Cover tape with a liberal coating of an electrical varnish or sealant providing flexible protection from oil, moisture, and corrosion. Obtain the engineer's approval of this electrical coating before using. Extend wire for termination 18 inches beyond the pole. Provide 60 inches of cable wire to be pulled into cabinets and left for terminations.

For all cables entering each pull box, provide an extra loop, approximately 6 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.

Install conductors in continuous lengths without splices from termination to termination. The contractor may splice only at hand-holes in the bases of poles. At locations where no transformer bases exist, splice at the hand-holes in poles.

Under the Cable Type UF bid items, furnish and install the underground cable network for highway lighting at traffic signal installations.

If installing lighting in conjunction with traffic signals, use type UF, 2 conductor with ground, solid or stranded copper conductor cable, sized as the plans show from the traffic signal control cabinet to the pertinent light pole base or bases. Strip the minimum length of jacket necessary to make terminations in a neat and technically proficient manner.

D Measurement
The department will measure (X) #12UF With Ground Street Lighting Riser Cable 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.0090.3006	2#12UF With Ground Street Lighting Riser Cable	LF
SPV.0090.3007	3#12UF With Ground Street Lighting Riser Cable	LF

Payment is full compensation for providing cable; for making all connections; for providing all connectors, including wire nuts, splices, tape, insulating varnish, or sealant; and for testing the circuits.

172. Type UF Cable, 2 Conductor, No. 14, Item SPV.0090.5001.

A Description
This work shall consist of furnishing and installing cable for confirmation lights and making all connections conforming to standard spec 655 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 Type UF, two conductor without ground, solid copper conductor cable, size No. 14.

C (Vacant)

D Measurement
The department will measure Type UF Cable, 2 Conductor, No. 14 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.0090.5001	Type UF Cable, 2 Conductor, No. 14	Each

Payment is 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.

173. Irrigation Service #1, Item SPV.0105.1001.

A Description
This special provision describes furnishing and installing an irrigation water service and related appurtenances for irrigation as shown on the drawings on Lincoln Memorial Drive near Station 430+50 LN and as hereinafter provided.

Prior to any work taking place the contractor shall contact City of Milwaukee irrigation coordinator Mr. James Kringer at (414) 708-2428 or James.kringer@milwaukee.gov

B Materials
B.1 Copper Pipe and Fittings
Copper tubing shall be "soft annealed" and shall conform to the standards for "Type K," prescribed in ANSI/AWWA C800-89 Section A.2 for "Copper Water Tubing" and to ASTM, designation B42 and B88-99, and current revisions thereof.

It shall be free from grooving cracks, indentations, flaws or other defects. At intervals of not greater than one and one-half feet, the tubing shall bear clear, permanent markings indicating the type and manufacturer.

"Flared" type fittings shall be used.

Unions shall be extra heavy three-part unions. Each fitting shall bear a clear, permanent marking indicating the manufacturer. Fittings shall be of cast brass meeting the requirements of ASTM B62. They shall be well made to assure uniformity in wall thickness and strength and shall be free from any defect which may affect their serviceability.

B.2 Service Saddle
Service saddle shall be bronze with AWWA taper thread, double strap, and conforming to Milwaukee Water Works Specification No. 30-B-9c (Mueller Co. or equal).

B.3 Corporation Stop
Corporation stop shall be a ball valve stop with inlet AWWA taper thread , outlet copper flare connection, and conforming to Milwaukee Water Works Specification No. 30a-C-3 (Mueller Co. or equal).

B.4 Curb Stops
Curb stops shall be ball curb valves with copper flare nut connections, quarter turn check, and conforming to Milwaukee Water Works Specification No. 30a-C-6 (Mueller Co. or equal).

B.5 Service Box
Service Box shall be a cast iron box of "Buffalo Pattern" design, adjustable screw type, and conforming to Milwaukee Water Works Specification No. 30-C-1 (Tyler Union or equal).

B.6 Galvanized Steel Piping and Fittings
Galvanized Steel Piping shall be thoroughly zinc coated (galvanized), Schedule 40 or heavier.

All fittings shall be rated 125 psi or greater.

B.7 Gate Valves
Gate valves shall be solid wedge disc bronze valves rated for 125 psi standard working pressure. Valves shall have a non-rising stem and threaded bonnet (Milwaukee Valve or equal).

B.8 Atmospheric Vacuum Breaker
RPZ Atmospheric Vacuum breaker shall be pipe applied vacuum breaker conforming to ASSE 1001. Body shall be brass and rated for 125 psi standard working pressure (Watts or equal). Place RPZ in aluminum enclosure sized for the RPZ. Use a WS Series enclosure by Watersafe or approved equal.

B.9 Irrigation Valve Box and Cover
Valve box and cover shall be made of heavy duty plastic design. Size shall be "Jumbo". Cover and box shall be green.

B.10 Precast Vault, Frame, and Lid
Precast vaults shall be 4'-0" inner diameter and conform to WISDOT Type 1 precast manholes. Frame and lid shall be WISDOT Type "L".

B.11 Bedding and Backfill Materials
Bedding and backfill materials shall conform to Milwaukee Water Works Water Service Piping Specifications and City of Milwaukee Water Main Installation Specifications. Backfill for piping that is below vegetated areas and has less than 24" cover shall be bedding sand.

B.12 Winterization Blowout
Provide a 1" blowout after the curb stop, bring to surface, cap with a threaded plug. Place in 12" rectangular valve box.

B.13 Polyethylene Wrap
Copper services shall be covered with a polyethylene envelope for a distance of six feet from the connection to the public water main along the service pipe.

Polyethylene film shall be manufactured and tested according to AWWA C105/A21.5 and:

1. Polyethylene wrap shall be Class "C" (black).
2. The polyethylene envelope shall be free of gels, streaks, pinholes,
3. particles of foreign matter, and undispersed raw materials. There shall be no visible defects such as holes, tears, blisters, or thinning out at folds.
4. The tape shall be thermoplastic material with pressure sensitive adhesive face.

B.14 Pipe Location Materials
Mark all non-conductive lateral pipes with a locating wire system.
Locating wire system consists of the following:

1. Tracer Wire: 45-mil solid copper, No. 12 HMW-PE yellow jacket coating. Install to enable electronic locating of underground utility.
2. Tracer Wire Locating Box: 2-1/2-inch diameter, minimum, ABS pipe with 2 point terminal box and cast iron cover.
3. Manufacturer: Valco, Inc. Model C.P. Mini Box, or an approved equal.

C Construction
Coordinate all construction with the City of Milwaukee Water Works. Except for the water meter, the contractor shall supply and install all materials for the irrigation service including hot tapping the water main.

The city will supply and install the water meter. Contractor shall verify exact meter brands/types/sizes with city prior to mobilizing for work and coordinate meter installation with the city. Meter installation is expected to occur at the same time as piping installation by the contractor.

Construct new valve manhole according to Part III of the Standard Specifications for Sewer and Water Construction in Wisconsin, 6th Edition, except where amended by these special provisions and the plans.

Construct and test water service according to Chapter 3 of the Milwaukee Water Works Water Service Piping Specifications, Subchapter IV of Wisconsin Administrative Code Chapter Comm 82, and the City of Milwaukee Water Main Installation Specifications. Install polyethylene wrap according to Appendix L of the Milwaukee Water Service Piping Specifications.

The locations of the irrigation services shown on the drawings are general in nature. The contractor shall provide all fittings and piping as necessary to construct the water services.

Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil. Support all utilities that are exposed due to trenching and excavations. Provide excavation dewatering as needed to facilitate construction.

Coordinate irrigation service construction with landscape planting and other site work.

D Measurement

The department will measure Irrigation Service #1 as a single lump sum unit of work, acceptably completed, for the construction of the irrigation service and related appurtenances.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.1001	Irrigation Service #1	LS

Payment is full compensation for furnishing and installing the irrigation service and related appurtenances according to the plans.

174. Irrigation Service #2, Item SPV.0105.1002.

A Description

This special provision describes furnishing and installing an irrigation water service and related appurtenances for irrigation as shown on the drawings on Clybourn Street near Station 23+15 CL and as hereinafter provided.

Prior to any work taking place the contractor shall contact City of Milwaukee irrigation coordinator Mr. James Kringer at (414) 708-2428 or James.kringer@milwaukee.gov.

B Materials

B.1 Copper Pipe and Fittings

Copper tubing shall be "soft annealed" and shall conform to the standards for "Type K," prescribed in ANSI/AWWA C800-89 Section A.2 for "Copper Water Tubing" and to ASTM, designation B42 and B88-99, and current revisions thereof.

It shall be free from grooving cracks, indentations, flaws or other defects. At intervals of not greater than one and one-half feet, the tubing shall bear clear, permanent markings indicating the type and manufacturer.

"Flared" type fittings shall be used.

Unions shall be extra heavy three-part unions. Each fitting shall bear a clear, permanent marking indicating the manufacturer. Fittings shall be of cast brass meeting the requirements of ASTM B62. They shall be well made to assure uniformity in wall thickness and strength and shall be free from any defect which may affect their serviceability.

B.2 Service Saddle
Service saddle shall be bronze with AWWA taper thread, double strap, and conforming to Milwaukee Water Works Specification No. 30-B-9c (Mueller Co. or equal).

B.3 Corporation Stop
Corporation stop shall be a ball valve stop with inlet AWWA taper thread , outlet copper flare connection, and conforming to Milwaukee Water Works Specification No. 30a-C-3 (Mueller Co. or equal).

B.4 Curb Stops
Curb stops shall be ball curb valves with copper flare nut connections, quarter turn check, and conforming to Milwaukee Water Works Specification No. 30a-C-6 (Mueller Co. or equal).

B.5 Service Boxes
Service Boxes shall be a cast iron box of "Buffalo Pattern" design, adjustable screw type, and conforming to Milwaukee Water Works Specification No. 30-C-1 (Tyler Union or equal).

B.6 Galvanized Steel Piping and Fittings
Galvanized Steel Piping shall be thoroughly zinc coated (galvanized), Schedule 40 or heavier.

All fittings shall be rated 125 psi or greater.

B.7 Gate Valves
Gate valves shall be solid wedge disc bronze valves rated for 125 psi standard working pressure. Valves shall have a non-rising stem and threaded bonnet (Milwaukee Valve or equal).

B.8Atmospheric Vacuum Breaker
RPZ Atmospheric Vacuum breaker shall be pipe applied vacuum breaker conforming to ASSE 1001. Body shall be brass and rated for 125 psi standard working pressure (Watts or equal). Place RPZ in aluminum enclosure sized for the RPZ. Use a WS Series enclosure by Watersafe or approved equal.

B.9 Irrigation Valve Boxes and Covers
Valve boxes and covers shall be made of heavy duty plastic design. Size shall be "Jumbo". Cover and box shall be green.

B.10 Precast Vault, Frame, and Lid
Precast vaults shall be 4'-0" inner diameter and conform to WISDOT Type 1 precast manholes. Frame and lid shall be WISDOT Type "L".

B.11 Bedding and Backfill Materials
Bedding and backfill materials shall conform to Milwaukee Water Works Water Service Piping Specifications and City of Milwaukee Water Main Installation Specifications. Backfill for piping that is below vegetated areas and has less than 24" cover shall be bedding sand.

B.12 Winterization Blowout
Provide a 1" blowout after the curb stop, bring to surface, cap with a threaded plug. Place in 12" rectangular valve box.

B.13 Polyethylene Wrap
Copper services shall be covered with a polyethylene envelope for a distance of six feet from the connection to the public water main along the service pipe.

Polyethylene film shall be manufactured and tested according to AWWA C105/A21.5 and:

1. Polyethylene wrap shall be Class "C" (black).
2. The polyethylene envelope shall be free of gels, streaks, pinholes, particles of foreign matter, and undispersed raw materials. There shall be no visible defects such as holes, tears, blisters, or thinning out at folds.
3. The tape shall be thermoplastic material with pressure sensitive adhesive face.

B.14 Pipe Location Materials
Mark all non-conductive lateral pipes with a locating wire system.
Locating wire system consists of the following:

1. Tracer Wire: 45-mil solid copper, No. 12 HMW-PE yellow jacket coating. Install to enable electronic locating of underground utility.
2. Tracer Wire Locating Box: 2-1/2-inch diameter, minimum, ABS pipe with 2 point terminal box and cast iron cover. Manufacturer: Valco, Inc. Model C.P. Mini Box, or an approved equal.

C Construction
Coordinate all construction with the City of Milwaukee Water Works. Except for the water meter, the contractor shall supply and install all materials for the irrigation service including hot tapping the water main.

The city will supply and install the water meter. Contractor shall verify exact meter brands/types/sizes with Utility prior to mobilizing for work and coordinate meter installation with the Utility. Meter installation is expected to occur at the same time as piping installation by the contractor.

Construct new valve manhole according to Part III of the Standard Specifications for Sewer and Water Construction in Wisconsin, 6th Edition, except where amended by these special provisions and the plans.

Construct and test water service according to Chapter 3 of the Milwaukee Water Works Water Service Piping Specifications, Subchapter IV of Wisconsin Administrative Code Chapter Comm 82, and the City of Milwaukee Water Main Installation Specifications. Install polyethylene wrap according to Appendix L of the Milwaukee Water Service Piping Specifications.

The locations of the irrigation services shown on the drawings are general in nature. The contractor shall provide all fittings and piping as necessary to construct the water services.

Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil. Support all utilities that are exposed due to trenching and excavations. Provide excavation dewatering as needed to facilitate construction.

Coordinate irrigation service construction with landscape planting and other site work.

D Measurement
The department will measure Irrigation Service #2 as a single lump sum unit of work, acceptably completed, for the construction of the irrigation services and related appurtenances.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.1002	Irrigation Service #2	LS

Payment is full compensation for furnishing and installing the irrigation service and related appurtenances according to the plans.

175. Survey Project 1300-13-74, Item SPV.0105.1003.

A Description
Perform work conforming to standard spec 105.6 and 650. This special provision describes modifying standard spec 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. Perform all survey required to lay out and construct the work under this contract, subject to engineer's approval.

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, structure layout, retaining walls, sign structures, ramp gates, pavement, barriers (temporary and permanent), electrical installations, supplemental control, slope stakes, ponds, ITS, FTMS, parking lots, utilities, 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.

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 5 business days of receiving the contractor’s request. The department incurs no additional liability beyond that specified in standard spec 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 at the completion of the project.

The traffic poles, bases and vaults are stationed to the center. See drawing details for any additional information.

D Measurement
Replace standard spec 650.4 with the following:

The department will measure Survey Project 1300-13-74 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.0105.1003	Survey Project 1300-13-74	LS

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.
SEF Rev. 12_0827

176. Concrete Pavement Joint Layout, Item SPV.0105.1004.

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.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.1004	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.

177. Pavement Cleanup Project 1300-13-74, Item SPV.0105.1005.

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. Routine sweeping shall occur on the following streets/parking lots and as directed by the engineer:

- Lincoln Memorial Drive
- Harbor Drive
- Chicago Street
- Van Buren Stet
- Milwaukee Street
- Jackson Street
- Van Buren Street

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 1300-13-74 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.0105.1005	Pavement Cleanup Project 1300-13-74	LS

Payment schedule for this item will be according to the percentage of contract value earned.

Payment is full compensation for surveillance, mobilization, sweeping, and disposing of materials.

SEF Rev. 12_1008

178. Geotechnical Instrumentation, Item SPV.0105.1006.

A Description

A.1 General

This special provision describes installing geotechnical vibrating wire piezometers and collecting data from the piezometers and settlement gauges for the project for the purpose of monitoring ground movement during construction of the retaining wall. The instrumentation program specified herein and shown on the plans is not intended to be used to ensure the safety of the work.

Install the required instrumentation and collecting the required ground monitoring data as specified herein. The instrumentation program required by this article does not relieve the contractor of responsibility for providing additional instrumentation and monitoring if, in the contractor's opinion, such additional instrumentation and monitoring are necessary to accomplish the work.

Instrumentation installed under this contract shall remain fully operational until after final pavement is constructed and after all appreciable settlement ceases as determined by the engineer.

This article covers the work necessary to furnish and install geotechnical instrumentation, maintaining installed instruments, taking initial and subsequent instrument readings, and removal and abandonment, if necessary, of the instruments after construction.

A.2 Submittals

Submit the following specific information for information only, at least 30 days prior to the start of instrument installation, except submit copies of DNR forms as soon as possible after instruments are installed or abandoned:

1. Submit qualifications and experience of instrumentation specialists and personnel.
2. Instrumentation shop drawings detailing locations, depths based on general information shown on the plans, type, details, and other pertinent information showing the installation details for each type of instrumentation required.
3. Drawing that indicates the locations of control points and benchmarks associated with surveys for monitoring geotechnical instrumentation.
4. Description of methods for installing and protecting all instruments.
5. Schedule of instrument installation related to significant activities or milestones in the overall project.
6. Following installation of the instruments and prior to the start of construction, submit as-built shop drawings showing the exact installed location, the instrument identification number, the instrument type, the installation date and time, the heading station or portal 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.
7. Manufacturer's literature describing installation, operation, and maintenance procedures for all instruments, materials, readout units, and accessories.
8. Drilling and installation logs for instrumentation installations prepared by the instrumentation specialist.
9. 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 see that the instrument is working correctly and has no defects or missing parts.
10. Submit permits and consents for drilling holes from ground surface and conducting monitoring activities.
11. Plans for geotechnical instrumentation to be installed at contractor’s option.
12. Copies of completed DNR abandonment forms for vibrating wire piezometers.

A.3 Definitions and Locations

Open Ground: Ground without any above- or below-grade facilities, paved or unpaved roads, and utilities within a 25-foot horizontal radius.

Piezometer (PZ): A vibrating wire piezometer constructed in a borehole.

Feature	Station	Offset	Estimated Tip Elev.
R-40-629	205+10 LE	40 feet RT	565
R-40-629	205+10 LE	40 feet RT	576
R-40-629	205+95 LE	15 feet LT	565
R-40-629	205+95 LE	15 feet LT	576

Readout Post (ROP): Posts with the readout box, positioned with agreement between the contractor and engineer.

Settlement Gauge (SG): Settlement gauges constructed under separate specification at the following locations:

Feature	Station	Offset	Estimated Tip Elev.
R-40-629	205+05 LE	40 feet RT	Top of drainage blanket
R-40-629	206+00 LE	20 feet LT	Top of drainage blanket

A.4 Quality Assurance

A.4.1 General

Notify the engineer at least 24 hours prior to all instrumentation installation operations so that the engineer may monitor the installation work.

Each instrument specified herein shall be the product of an acceptable manufacturer currently engaged in manufacturing geotechnical instrumentation hardware of the specified types.

A.4.2 Personnel Qualifications

Qualified technicians with a minimum of 2 years' experience in the installation of geotechnical instrumentation similar to those specified herein.

Instrumentation Specialist: A professional civil or geotechnical engineer or engineering geologist, with a minimum of 5 years' experience in the installation of instrumentation specified herein, shall prepare instrumentation shop drawings and supervise and direct technicians and be responsible for instrument installation required. The instrumentation specialist shall be physically present at the installation sites to supervise the installations.

A.4.3 Control Points

Surveys for monitoring geotechnical instrumentation shall be referenced to the same control points and benchmarks established for setting out the work. Control points shall be tied to benchmarks and other monuments outside of the zone of ground movements that might result from underground excavations.

A.4.4 Tolerances
Piezometer shall be installed within 12 inches of the horizontal locations indicated in this special provision or approved shop drawings.

Should actual field conditions prohibit installation at the locations and elevations indicated on the plans, prior acceptance shall be obtained from the engineer for new instrument locations and elevations.

A.4.5 Project Conditions
Obtain necessary permits for the installation of monitoring systems.

Provide the engineer and the department access to the instruments at all times.

All PZs shall be protected from vandalism or other accidental damage.

B Materials
B.1 Protection
Provide a protection cover for readout post.

B.2 Filter Pack
Filter pack shall be clean natural silica sand; graded such that all of the material passes the No. 4 sieve and is retained on the No. 30 sieve.

B.3 Filter Pack Seal
Filter pack seal shall be clean natural silica sand; graded such that all of the material passes the No. 10 sieve and is retained on the No. 40 sieve.

B.4 Bentonite Seal
Bentonite pellets used to form bentonite seals shall be 3/8-inch diameter compressed pellets made from high swelling montmorillonite.

B.5 Grout
Grout mixes for each instrument type are specified herein.

B.6 Piezometers (PZ)
The vibrating wire piezometer cable will run to the cable box in a trench backfilled with granular backfill.

C Construction
C.1 General
Instrumentation shall be installed at the locations indicated on this special provision or approved shop drawings, and as approved by the engineer. The piezometer shall be installed after wick drain and drainage blanket construction (by others) excavation of the retaining wall is completed. All instrumentation shall be installed under the direct supervision of the contractor’s instrumentation specialist.

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 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.

Geotechnical instrumentation shall be installed and baseline surveys or initial readings completed before commencing any filling work for the retaining wall and embankment. A qualified instrumentation specialist shall install the instrumentation as shown on the project plans and as specified herein. The instrumentation specialist shall have documented experience as set forth in the subsection, Quality Assurance.

An as-installed position survey shall be conducted to determine the horizontal and vertical positions of all instruments according to the requirements herein. Furnish the engineer with a copy of the results within three days of field survey data acquisition.

C.2 Review of Instrumentation Plan

The instrumentation plan specified herein and shown on the plans may be modified by the engineer prior to installation, to suit the contractor's means and methods of construction. Prior to ordering materials or installation of instruments, confer with the engineer as to the suitability of the planned instruments and locations, regarding proximity to excavations and compatibility with the means and methods of excavation, ground support and groundwater control.

Replace, at no cost to the department, instrumentation in place that becomes inaccessible or unreadable as a result of the contractor’s means and methods of construction. The locations of replacement instruments shall be jointly determined by the engineer and contractor.

C.3 Installation

Complete installation and testing of each instrument located outside of excavations a minimum of 1 week prior to retaining wall construction within 100 feet of the instrument.

The anticipated general locations of instrumentation are shown in this special provision. Check instruments to be installed in borings for interference with utilities and subsurface facilities. Mark locations of all instruments 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.

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.

C.4 Protection and Maintenance

Flag and protect all locations. Exercise care during construction so as to avoid damage to instrumentation. Repair or replace instrumentation that is 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 as soon as practical after notification by the engineer as to whether a repair or replacement is required. A complete set of readings shall be obtained from all nearby instrumentation if any instrumentation is repaired or replaced. Engineer will determine which instrumentation requires complete set of readings.

Maintain exposed parts of installed instruments as necessary to ensure their availability for use for the duration of the work. The engineer will perform maintenance and calibration of readout devices.

C.5 Soil Drilling and Sampling

Hollow stem auger methods may be used to provide a casing for temporary soil support. Boreholes shall be oversized at the ground surface as necessary to accommodate installation of protective covers.

Arrange ports in the drilling bit so that there is no jetting action of the drilling fluid ahead of the bit. Use the minimum amount of fluid necessary to carry away the cuttings.

Complete soil sampling at intervals of 5.0 feet or less using standard penetration tests that are conducted according to ASTM D 1586.

Store representative sample portions not retained for analytical laboratory testing in glass jars approximately 5 inches high and 1-3/4 inches in inside diameter at the mouth. Provide jars with metal screw caps containing a rubber or waxed paper gasket that forms an airtight seal when closed. Provide jars with labels large enough to identify the jar with the project number and name, boring number, sample number, depths at top and bottom of sample, blow count and recovery. Perform the laboratory testing on retained samples as deemed necessary.

Observe all soil drilling and sampling and prepare a log of the boring.

Upon completion of drilling, flush the boring with clear water prior to instrument installation.

C.6 Potholing

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. Perform potholing to at least one foot below anticipated utility bottom levels prior to installing piezometers.

C.7 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.8 Installing vibrating wire piezometer

Drill, sample and log borings in soil drilled for the purpose of installing vibrating wire piezometers, settlement systems and observation wells as specified here in subsection, Soil Drilling and Sampling. Drill borings using 4-inch minimum inside diameter casing and water. Drill the borings so as not to damage adjacent utilities. Drill borings for double piezometers using 6-inch minimum inside diameter casing for a minimum of the full depth of the upper vibrating wire piezometer. If use of drilling fluid is necessary to stabilize the borehole, use a biodegradable organic polymeric drilling fluid. Perform a standard penetration test at 5.0-foot depth intervals.

Install the vibrating wire piezometer tip, filter pack, filter pack seal, and annular space seal as determined by contractor's engineer or approved alternatives. The engineer will determine the depth of the sensing zone for each vibrating wire piezometer installed based upon observations of retained soil samples. Withdraw the drill casing in small increments as the backfill materials are placed, so that collapse of the borehole does not occur. Do not rotate casing during withdrawal.

Place filter pack material slowly so that bridging does not occur in the boring and to prevent the instrument from being lifted as the casing is withdrawn. Use a measuring rod or similar device to measure the height of the filter pack to ensure that the filter pack is installed over the proper depth interval. Carefully raise and lower the measuring rod while the filter pack is installed, to prevent bridging and to tamp the filter pack in place.

Place a filter pack seal above the filter pack. Place the filter pack seal in a similar manner as for filter pack material. Place a bentonite seal above the filter pack seal.

Place the annular space seal by tremie grouting. Place the grout in such a manner as to not disturb the integrity of the filter pack and seal.

For double piezometers, allow the annular space seal between the lower and upper sensing zones to set a minimum of 12 hours before the upper filter pack is placed. Alternatively, form the annular space seal by a mixture of coarse sand and grout placed in small lifts. Tamper the sand during placement. Place grout by tremie method. Take care to provide a watertight seal between the upper and lower sensing zones, and to avoid contaminating the upper sensing zone with grout.

Grout for the annular space seal for piezometers shall consist of a bentonite to cement ratio of 0.15/1 by weight, with sufficient water to allow pumping. Mix bentonite and water first.

C.9 Schedule of Instruments Installed
For the retaining wall, install instruments of the number and type, at the location and to the depths indicated on this special provision.

C.10 Initial Readings
Record initial readings for each instrument before construction of the retaining wall. Notify the engineer when initial readings will be made, and the engineer may elect to participate or observe in taking initial readings.

Record initial vibrating wire piezometer readings a minimum of 48 hours after completing installation and testing of each piezometer. Two sets of vibrating wire piezometer readings, at least 4 hours apart will be taken. If the variation in vibrating wire piezometer readings exceeds 0.1 foot, the two sets of readings will be repeated. The arithmetic average of the two sets of vibrating wire piezometer readings that do not vary by more than 0.1 foot will be used as the initial baseline vibrating wire piezometer readings.

C.11 Monitoring Instruments
Obtain and record data readings at regular intervals as specified herein. Submit any newly obtained recorded data to the engineer within 24 hours of obtaining new readings.

After initial readings, obtain and record subsequent regular data readings at each structure or embankment area on regular intervals based on the following criteria:
Prior to retaining wall construction:

1. Record a minimum of one reading per week per instrument.

2. During retaining wall construction:
   Record one reading per instrument for every 5 feet of vertical retaining wall construction or at least every two days, whichever is the shorter interval.

3. After retaining wall and embankment construction is completed:
   Record two reading per instrument every week, with the readings taken at least two days apart.

As a minimum, data should be provided within 24 hours of collection to the engineer for evaluation. Immediately contact engineer if values obtained indicate changes that are abrupt, have increasing rate of change, are indicative of deteriorating conditions, or other cause for concern.

Based on evaluation of the data collected, the engineer will determine if continued instrumentation readings are necessary. If additional readings are necessary, the readings will be obtained by the engineer.

C.12 Abandonment of Instrumentation
At the completion of the job or as directed by the engineer, abandon or remove instrumentation. Grout the full depth of instrument casings and pipes by tremie method or by pressure injection from the ground surface. Grout shall consist of cement and water, with the minimum amount of water necessary to allow pumping.

C.13 Protection
Protect instrumentation and terminal boxes from damage as a result of construction activity. Replace any instrumentation and terminal boxes at the contractor costs. Provide caps to protect active instrumentation.

Contractor shall protect all existing, active geotechnical instrumentation installed during the Hoan Bridge project. Any changes to existing instrumentation shall be repaired and resume fully operational at the contractor's expense.

D Measurement
The department will measure Geotechnical Instrumentation as a complete 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 items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.1006	Geotechnical Instrumentation	LS

Payment is full compensation for providing submittals, furnishing materials, installation, testing, protection, maintenance, replacement or repair of damaged instruments or installations, obtaining data readings, abandonment.

179. Railing Tubular Type H Modified B-40-400-1D, Item SPV.0105.2001.

A Description
This special provision describes providing railing fabricated and constructed according to standard spec 513.

B Materials
Furnish materials conforming to standard spec 513. 2.

C (Vacant)

D Measurement
The department will measure Railing Tubular Type H Modified B-40-400-1D 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 item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.2001	Railing Tubular Type H Modified B-40-400-1D	LS

Payment is full compensation for providing, fabricating, transporting, and erecting the railing; for painting pipe and steel railing; for zinc coating or painting steel tubular railing; for providing and placing metal shims under the bases if required; and for providing and placing the anchor bolts.

180. Lighting System Integrator, Item SPV.0105.3001.

A Description

This special provision describes coordinating freeway 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 freeway lighting specifications and practices.

C Construction

Assign one individual person as the freeway lighting integrator.

The freeway lighting integrator shall:

1. Familiarize their selves with the location and nature of existing lighting circuits. This familiarity shall include the extent of any lighting system that overlaps project limits.
2. Maintain a file of applicable permits or licenses issued to the contractor, and convey copies to the engineer.
3. Keep with them at all times a contact list of affected lighting personnel.
4. Maintain a record of tagouts and the clearance of tagouts.
5. Interface with department electrical personnel to determine how contract limits might affect maintenance or operation of existing systems.
6. 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 them by other provisions of the contract.
7. Inform the department of any lighting outages, including outside the project limits, where a lighting system crosses the project boundary.
8. 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.

9. Maintain records of tests, including: “meg” tests, amperage draw per circuit leg, voltage reading at disconnect, and voltage reading at the furthest pole per circuit leg. Convey these records at time of acceptance or partial acceptance.
10. At the time of acceptance or partial acceptance, convey as-built drawings in both the following formats: plan redlines and .dgn and/or .PDF electronic as directed by the engineer. Include utility service extensions.
11. Secure copies of operator’s manuals, tear sheets, and other literature as may be provided by manufacturers of some lighting materials, and convey a minimum of three sets to the department.
12. Work with the engineer to notify department electrical personnel of acceptance or partial acceptance.
13. Perform related duties as may be needed to ensure continuity of freeway lighting during construction, and orderly transfer upon completion.
14. 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 Freeway Lighting Integrator 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.0105.3001	Lighting System Integrator	LS

Payment is full compensation for personnel costs; for all required coordination, record-keeping, and documentation; and for providing all relevant records and documentation to the department.

181. Maintenance of Lighting Systems, Item SPV.0105.3002.

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. Be responsible 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. The maintenance of lighting system shall include all the lighting systems associated with the lighting controllers, impacted by proposed lighting work which could be beyond the proposed construction limits. The department or the owners shall provide the available record drawings requested by the contractor, if the record drawings are not available, the contractor is responsible to verify the existing condition.

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. Any equipment found damaged or not functional during preconstruction inspection shall be fixed or replaced by the contractor as agreed by the engineer and the owners at no additional cost to the department or the owners.

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.

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 plans 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. 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. Isolate the affected circuits by means of in-line waterproof fuse holders as specified elsewhere and as approved by the engineer.

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 shall be defined as any temporary or final lighting systems or part of a lighting system which is to be constructed under this contract.

Maintain all items installed under this contract. Maintenance shall include, 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. Include the potential cost of replacing or repairing any malfunctioning or damaged equipment in the bid price of this item; it will not be paid for separately.

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.

Provide weekly night-time patrol of the lighting system, with patrol reports filed immediately with the engineer and 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. **Service 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.

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. 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.

Repair damage caused by the contractor's operations at no additional cost to the department.

C.5 Operation of Lighting

The lighting shall be operational every night, dusk to dawn. Duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously. Do not keep lighting systems in operation during long daytime periods. Demonstrate to the satisfaction of the engineer that the lighting system is fully operational 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.0105.3002	Maintenance of Lighting Systems	LS

Payment is full compensation for Maintenance of Lighting Systems.

182. Temporary Vehicle Detection System, Lincoln Memorial Dr and Michigan St, Item SPV.0105.5001.

A Description

This special provision describes furnishing, installing, and maintaining temporary vehicle detection systems at the temporary signalized intersections as shown in the plans.

The desired temporary vehicle detection zones are as shown on the plans.

Temporary vehicle Detection system shall become property of City of Milwaukee post construction.

B Materials

With prior approval of the engineer and the department's Electrical Field and Traffic Signal Design Units, select the vehicle detection technology best suited for the site conditions and the anticipated construction work zones and activities. The engineer reserves the right to request a demonstration of any or all temporary vehicle detection technologies prior to approval. Vehicle detection technologies considered shall include, but not necessarily be limited to, microwave detection and video detection.

Do not damage new pavement for any temporary vehicle detection equipment.

Provide all necessary equipment for the approved Temporary Vehicle Detection System.

C Construction

The temporary vehicle detection 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

Install the temporary vehicle detection system as shown in the plans and according to the manufacturer's recommendations. Determine a suitable location for the temporary vehicle detection sensors for each stage and sub-stage of construction. Relocate the temporary vehicle detection sensor to a suitable location if construction activities and/or construction staging changes impede the sensor operation.

All cables associated with the temporary vehicle detection system shall be routed to the cabinet. Each lead shall be appropriately marked as to which street or avenue and traffic signal phase it is associated.

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 on a bi-weekly basis and at the opening of each stage of temporary traffic signal operation to ensure that they are working and are aimed properly. 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.

D Measurement

The department will measure Temporary Vehicle Detection System, (Location) as a single complete lump sum unit of work per intersection, complete in place and accepted.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.5001	Temporary Vehicle Detection System, Lincoln Memorial Dr and Michigan St	LS

Payment is full compensation for demonstrating and selecting the temporary vehicle detector system; for furnishing and installing all required equipment, materials, and supplies; for checking and/or adjusting the temporary detection zones on a bi-weekly 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. Temporary Vehicle Detection System to become property of City of Milwaukee post construction.

183. Install Fiber Optic in Cabinet, Lincoln Memorial Dr and IH 794 Ramps, Item SPV.0105.5002; Lincoln Memorial Dr and Clybourn St, Item SPV.0105.5003; Lincoln Memorial Dr and Michigan St, Item SPV.0105.5004.

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 Ethernet switches. The materials will be provided with the traffic signal cabinet. The patch panels will have pre-terminated fiber optic cable pigtails. If required 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 all patch panel and Ethernet switch attachment hardware.

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. Leave the remainder of the fiber optic cable coiled in the nearest communication pull box or vault.

Install the fiber jumpers and CAT-5e cable and provide a continuous connection from the communication vault to the controller.

D Measurement

The department will measure Install Fiber Optic in Cabinet (Location) 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.0105.5002	Install Fiber Optic in Cabinet, Lincoln Memorial Drive and IH 794 Ramps	LS
SPV.0105.5003	Install Fiber Optic in Cabinet, Lincoln Memorial Drive and Clybourn St	LS
SPV.0105.5004	Install Fiber Optic in Cabinet, Lincoln Memorial Drive and Michigan St	LS

Payment is full compensation for installing pre-terminated patch panels, Ethernet switches, and fiber optic cable in conduit; and for furnishing and installing attachment hardware, fiber jumpers, and CAT-5e cable.

184. Install Traffic Signal Cabinet, Lincoln Memorial Dr and IH 794 Ramps, Item SPV.0105.5007; Lincoln Memorial Dr and Clybourn Street, Item SPV.0105.5008; Lincoln Memorial Dr and Michigan St, Item SPV.0105.5009; Clybourn St and Van Buren St, Item SPV.0105.5010.

A Description

This special provision describes the transporting and installing of the state-furnished traffic signal cabinet, signal controller, and other cabinet equipment for traffic signals, and for making the cabinet fully operational as shown in the plans.

B Materials

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 materials five working days prior to picking the materials up. The department will provide notification at the preconstruction meeting of the traffic signal cabinet vendor and provide the vendor's contact information.

The regional signals engineer will provide the project plans and specifications to the department's traffic signal cabinet vendor prior to scheduled field installation. The contractor shall deliver the traffic signal cabinet from the department's Electrical Shop to the site location.

Provide all other needed materials in conformance with standard spec 651.2, 652.2, 653.2, 654.2, 655.2, 656.2, 657.2, 658.2 and 659.2.

C Construction

Perform work according to standard spec 651.3, 652.3, 653.3, 654.3, 655.3, 656.3, 657.3, 658.3 and 659.3 except as specified below.

Install the state-furnished traffic signal cabinet on the concrete control cabinet base the same day it is delivered to the site location.

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 at least five working days prior to cabinet acceptance testing and participate in the acceptance testing.

D Measurement

The department will measure Install Traffic Signal Cabinet (Location) 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.0105.5007	Install Traffic Signal Cabinet, Lincoln Memorial Dr and IH 794 Ramps	LS
SPV.0105.5008	Install Traffic Signal Cabinet, Lincoln Memorial Dr and Clybourn St	LS
SPV.0105.5009	Install Traffic Signal Cabinet, Lincoln Memorial Dr and Michigan St	LS
SPV.0105.5010	Install Traffic Signal Cabinet, Clybourn St and Van Buren St	LS

Payment is full compensation for installing and testing the Traffic Signal Cabinet and cabinet equipment; 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.

185. EVP Detector Head Installation, Lincoln Memorial Dr and IH 794 Ramps, Item SPV.0105.5011; Lincoln Memorial Dr and Clybourn St, Item SPV.0105.5012.

A Description

This special provision describes the transporting and installing of department furnished Emergency Vehicle Preemption (EVP) Detector Heads, EVP Confirmation Lights and EVP Detector Head Mounting Brackets.

B Materials

Use materials furnished by the department including: Emergency Vehicle Preemption (EVP) Detector Heads, EVP Confirmation Lights and EVP Detector Head Mounting Brackets.

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 three working days prior to picking the materials up.

C Construction
Install the EVP detector heads, EVP Confirmation Lights and EVP detector head mounting brackets 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, EVP Confirmation Lights and EVP Detector Head Mounting Brackets.

D Measurement
The department will measure transporting EVP Detector Head Installation (Location), 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.0105.5011	EVP Detector Head Installation, Lincoln Memorial Dr and IH 794 Ramps	LS
SPV.0105.5012	EVP Detector Head Installation, Lincoln Memorial Dr and Clybourn St	LS

Payment is full compensation for transporting and installing of department furnished Emergency Vehicle Preemption (EVP) Detector Heads, EVP Confirmation Lights and EVP Detector head Mounting Brackets.

186. Temporary Traffic Signal, Lincoln Memorial Dr and Michigan St, Item SPV.0105.5013.

A Description
Work under this item consists of providing, maintaining a temporary traffic signal throughout construction that will become property of the City of Milwaukee post construction.

B Materials
(1) Use department furnished control cabinet and signal controller for this temporary traffic signal. Installation of controller and concrete controller base shall be paid under separate bid items.
(2) The entire temporary signal will become property of the City of Milwaukee upon project completion.
(3) When available the contractor shall use the proposed underground electric service and new meter breaker pedestal for the operation of the Temporary Traffic Signal. In the interm, the contractor may use the existing electrical service. Contractor shall coordinate the interm temporary service with the City of Milwaukee and the local

electrical utility at least four days prior to making the switch. The department will pay for all energy costs for the operation of the Temporary Traffic Signal during construction.

Furnish and install a generator to operate the Temporary Traffic Signal for the time required to switch from the interim service to the permanent Temporary Traffic Signal service. Generators shall be incidental to temporary traffic signal work.

(4) The contractor may furnish used traffic signal faces according to standard spec 661.2.1 (4)

(5) The contractor shall furnish the following temporary signal materials per 661.2:

a. Wood Poles Class 4
b. Cable
c. Guy, Span and Messenger Wire
d. Guy, Span and Messenger Wire Mounting Wire Hardware
e. Tether and Messenger Wire
f. Splice Boxes
g. Signal Faces

C Construction

Install the following items for the temporary signal according to standard spec 661.3:

(1) General
(2) Wood Poles, Class 4
(3) Wire and Cable
(4) Maintenance
(5) Tether Wire Mounting Hardware
(6) Tether Wire
(7) Span Wire
(8) Span Wire and Tether Wire Signal Head Mounting Hardware

The Traffic Signal Controller and Cabinet Bases that will be a permanent assembly and be paid under separate items.

Follow standard spec 661.3.2.6 for implementation. The signal shall be not be removed at the end of the project. The temporary signals will become property of the City of Milwaukee at final acceptance.

D Measurement

The department will measure Temporary Traffic Signals (Intersection) 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.0105.5013	Temporary Traffic Signals, Lincoln Memorial Dr and Michigan St	LS

Payment for the Temporary Traffic Signals (Intersection) is full compensation for providing, operating, maintaining, and repairing the complete temporary installation. Temporary traffic signal is to become property of City of Milwaukee. Payment also includes the following:

1. Providing replacement equipment.
2. All utility charges for installation, disconnection, and energy service through completion.

187. Install S-F Microwave Detector S40-362, Item SPV.0105.5014; S40-850, Item SPV.0105.5015.

A Description

Work under this item consists of installing State Furnished (S-F) Microwave Detector, microwave detector cable and all incidentals necessary to successfully install microwave detectors on sign structure as shown on the plans and as hereinafter provided.

B Materials

Pick up the department furnished Microwave Detection 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

Contact the EFU at (414) 266-1170 to coordinate the locations of the cameras at least five working days prior to installation. Install the department furnished pole/arm mounting brackets, extension arms (if required), and microwave detectors per manufacturer recommendations.

Install the power and communication cables to run continuously (without splices) from the traffic signal cabinet to the microwave detectors plus an additional 16-feet in each pull box and an extra 10-feet in the sign structure handhole. Terminate the ends of the cables, if required, and make all connections to the microwave detectors. 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 sign structure handhole to indicate the equipment label (i.e. MD1, MD2, etc.).

Notify department's Electrical Shop at (414) 266-1170 upon completion of the installation.

The department will provide notification of the microwave detection system vendor and provide the vendor's contact information. Coordinate directly with the department's microwave detector system vendor to arrange for the vendor to program the microwave detector 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 microwave units during the microwave detectors system programming.

D Measurement

The department will measure Install S-F Microwave Detector (Location) as a single lump sum unit of work for each microwave detection system per sign 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.0105.5014	Install S-F Microwave Detector S40-362	LS
SPV.0105.5015	Install S-F Microwave Detector S40-850	LS

Payment is full compensation for transporting and installing the microwave detection system, cable, mounting hardware, and microwave detectors units; arranging for and providing programming by the vendor; assisting the department and vendor during the microwave system programming.

188. Sand-Set Concrete Paver Paving Over Concrete Base – 80mm, Item SPV.0165.1001.

A Description

This special provision describes furnishing and installing all of the concrete base and 6-inch concrete header at paver areas within the roadway medians (including expansion joints), and paver setting bed; for cutting of the concrete pavers to fit and setting the concrete pavers as shown on the plans; provide geotextile fabric, PVC piping, pea gravel, and filter fabric at weep holes, as shown on the Drawings, and as hereinafter provided.

Construction work includes the excavation and removal of existing material from project site in order to construct the concrete base, adding joint sand between the pavers, providing smooth dowel bars, and cleaning and protection of finished concrete unit paver joints and surfaces.

B Materials

B.1 References:

ASTM International (American Society for Testing and Materials)

- ASTM C33 – Specification for Concrete Aggregates.
- ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
- ASTM C144 - Specification for Aggregate for Masonry Mortar.
- ASTM C936 - Specification for Solid Concrete Interlocking Paving Units.
- ASTM C979 – Specification for Pigments for Integrally Colored Concrete.
- ASTM C1645 - Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Interlocking Paving Units.

B.2 Delivery, Storage and Handling:

Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact:

- Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
- Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
- Unload pavers at project site in such a manner that no damage occurs to the concrete pavers.

Storage and Protection:

- Store materials protected such that they are kept free from mud, dirt, and other foreign materials.
- Store concrete paver cleaners and sealers according to manufacturer's instructions.
- Cover joint sand with waterproof covering if needed to prevent exposure to rainfall or removal by wind. Secure the covering in place.

B.3 Extra Materials:

Provide minimum 100 square feet additional paver material on pallets and covered with stretch wrap for use by City of Milwaukee for maintenance and repair as attic stock. Extra pavers to be from the same production run as installed materials. Store extra paver materials at location designated by Jeffrey S. Polenske, City of Milwaukee Engineer, at (414) 286-2400.

B.4 Project Site Conditions:

Environmental Requirements:

- Sand setting bed and pavers shall not be installed between November 1 and March 1 without prior written approval by engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400. Any work completed during this timeframe without written approval is at contractor's risk and may be subject to rejection.

- Do not install during heavy rain or snowfall.
- Do not install over frozen base materials.
- Do not install frozen aggregates.

6-inch wide x 12-inch deep concrete header and concrete base and base aggregate dense, 1 ¼" for roadway median paver areas to be provided according to the Standard Specifications, standard spec 602 Concrete Sidewalks.

B.5 Concrete Paver System:
Pavers shall conform to the following requirements set forth in ASTM C936:

- Measured length or width of test specimens shall not differ by more than +/- 0.063 in, while measured thickness shall not differ by more than +/- 0.125 in.
- Average compressive strength of 8,000 psi with no individual unit under 7,200 psi when tested according to ASTM C140.
- Average absorption of five (5) percent with no unit greater than 7 percent when tested according to ASTM C140.
- For freeze-thaw testing, the average mass loss of all specimens tested shall not be greater than (A) 225 g/m2 when subject to 28 freeze thaw cycles, or (b) 500 g/m2 when subject to 49 freeze thaw cycles. Testing shall be conducted using a 3 percent saline solution in according to ASTM C1645.

Paver Type:

- Product: Belgard AquaLine L-stone Permeable Paver 12" X 12" X 80mm with chamfered edges and Texturegard Texture, smooth.
- Spacers: Duel positive –interlocking integrated bars.
- Joint/Void: Maximum 8mm non-structural voids.
- Appearance: Multi Cobble.
- Color: Graphite. Pigment in Concrete Pavers shall conform to ASTM C979.
- Processes: Smooth.
- Manufacturer: Northfield - an Oldcastle Company, Nate Gish, (262) 707-3974 or nate.gish@oldcastle.com.
- No substitutions allowed.

Sand for Setting Bed: ASTM C33; clean, washed river or bank sand.

B.6 Joint Filling Materials:
Polymeric Joint Sand shall be manufactured by Techniseal: Series: HP^2 polymeric jointing sand; color: grey; Website: www.techniseal.com or approved equal that is rated for a minimum joint width of 5/16-inch from the following:

- Alliance Designer Products: Gator MAXX Polymeric Sand; Website: www.alliancegator.com.
- The Sakrete Companies: Website: www.sakrete.com.

Joint Filler: ASTM D1751, Bituminous fiber, 1/2-inch wide by depth of concrete less 1/8-inch.

PVC Weeps: PVC Schedule 40, 2-inch diameter.

Filter Fabric for Weep Holes: Geotextile fabric which allows drainage water to pass through and is not prone to clogging.

Paver Edging: Formed concrete header as indicated on the Drawings.

B.7 Submittals:
Provide the following submittals to the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, for written approval prior to construction.

Shop Drawings: Indicate on Shop Drawings, layout pattern of pavers, layout of concrete header and adjacent curbing, dimensions of paved areas, dimensions of paved areas, control joints, expansion joints, elevations, and affected adjacent construction.

Product Data: Submit characteristics of paver unit, dimensions, and special shapes.

Samples: Submit two full-sized samples of paver to be used illustrating style, size, color range and surface texture.

Manufacturer's Installation Instructions: Submit substrate requirements, installation methods, and Material Safety Data sheets for the safe handling of the specified material and products

B.8 Mock-Up:

- Install a min. 10 foot by 10 foot paver area mock-up for approval by the engineer and owner.
- Use this mock-up area to determine surcharge of the sand layer, joint sizes, lines, laying pattern(s), color(s) and texture of the work.
- Mock-up shall be a complete representation of completed concrete paver system installation including concrete header, concrete base, sand setting bed, concrete pavers, joint sealers, joint sand, control and expansion joint installation and all related accessories.
- This area will be used as the standard by which the work will be judged.
- Subject to acceptance by engineer and Jeffrey S. Polenske, City of Milwaukee Engineer (414-286-2400), mock-up may be retained as part of finished work.
- Any and all work performed without written approval of the mock-up from engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, is at contractor’s risk and may be subject to rejection.
- If mock-up is not accepted or not retained as part of the work, remove and dispose of all mock-up materials.

C Construction
Install the 6-inch concrete header and concrete base and aggregate for roadway median paver areas as described in Wisconsin standard spec 602 Concrete Sidewalks.

C.1 Examination:
Acceptance of Site and Verification of Conditions:

1. Contractor shall inspect, accept and certify in writing to the engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, that site conditions meet specifications for the following items prior to installation of interlocking concrete pavers.
    a. Verify that concrete base materials, thickness, surface tolerances and elevations conform to specified requirements.
    b. Verify location of 2-inch diameter PVC weep holes spaced as indicated on Drawings and at lowest elevations against curbs, walls, or other permanent structures.
    c. Verify weep holes are filled with washed pea gravel and covered with free-draining filter fabric. Provide temporary plugs for holes to prevent ingress of sand-asphalt setting bed or neoprene adhesive during construction. Remove plugs when paving adjacent to drain holes.
    d. Conduct moisture tests to verify that concrete surfaces are cured, free from hydrostatic pressure and having a moisture content of less than 5 percent.
    e. Verify location, type, and elevations of edge restraints, concrete collars around utility structures, and drainage inlets.
    f. Do not proceed with installation concrete pavers until base conditions are corrected by the contractor.

C.2 Preparation:
Verify concrete base is dry, certified by general contractor as meeting material, installation and grade specifications. Verify that concrete base is clean, dry, and ready to accept sand setting bed, pavers, and imposed loads.

C.3 Concrete Paver System:
Verify that concrete pavers are free from dust, dirt, and stains. Do not use soiled, cracked, or broken brick paver units. Spread setting bed sand evenly over prepared substrate surface to a maximum thickness as indicated on the Drawings. Dampen and roller compact sand to level and even surface. Screed and scarify top 1/2-inch of sand. Place paver units in pattern as indicated on Drawings from straight referenced edge and maintain a joint width of 5/16-inch at all vertical edges of each paver and at abutting vertical surfaces and protrusions. Maintain straight pattern lines evenly spaced, joint lines and coursing as indicated on the Drawings. Cut pavers to fit edges with a power saw. No cut paver shall be smaller than 1/3 of a whole unit if exposed to vehicular traffic. Install full-depth expansion joints at locations indicated on the Drawings. Form control and expansion joints as detailed on Drawings. Install backer rod and joint sealant. Form expansion and control joints in concrete as detailed on the Drawings.

C.4 Joint Filler and Sealant:
Extend control and structural joints through full depth of concrete base. Install joints as indicated on Drawings at all building facades or other vertical surfaces. Install joint sealant according to manufacturer's recommendations.

C.5 Polymeric Joint Sand Filling:
After the pavers, joint filler, and sealant are installed, install joint sand in exact accordance with manufacturer's recommendations and only during proper exterior weather conditions. Remove all excess joint sand from site.

Tamp and level paver units with mechanical vibrator until units are firmly bedded, level, and to correct elevation and gradients. Do not tamp unrestrained edges. Recover with additional sand, sweep into joints and hollow areas of pavers. Remove excess sand.

The final surface tolerance from grade elevations shall not deviate more than plus or minus 3/8 inch under a 10 foot straightedge. Check final surface elevations for conformance to Drawings. The surface elevation of pavers shall be 1/8 inch to 1/4 inch above adjacent drainage inlets, concrete collars or channels. Lippage: No greater than 1/8 inch difference in height between adjacent pavers. Joint width between pavers shall not deviate more than plus or minus 1/8-inch.

C.6 Cleaning:
Do not clean pavers for a minimum of three days to ensure polymeric sand joints are fully set. Finished concrete paver surfaces shall be free of dirt, debris, stains and "hazing" in order to be deemed as acceptable. Any surface stains or hazing left on the pavers must be removed with appropriate paver cleaner. Clean finished concrete paver joints and paver surfaces according to the cleaner manufacturer's written requirements. Do not use abrasive cleaning tools that would damage finished joints and paver surfaces. Prior to installation, test paver cleaner in discreet area to verify paver surface or adjacent paving will not be damaged or discolored. Testing area shall be approved by engineer and Jeffrey S. Polenske, City of Milwaukee Engineer, (414) 286-2400, prior to construction.

After work in this section is complete, the contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site. Do not permit traffic over unprotected paver surface for seven days. Protect with plywood sheeting as required by engineer or owner.

D Measurement
The department will measure Sand–Set Concrete Paver Paving Over Concrete Base – 80 mm in area by the square 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.0165.1001	Sand-Set Concrete Paver Paving over Concrete Base – 80mm	SF

Payment is full compensation for furnishing and installing all concrete base and Sand-Set Concrete Paver Paving; excavation and removal of existing soils, and incidentals necessary to complete the contract work. Incidentals to include: Ssand setting bed, joint sand, base aggregate, 2" PVC weeps, washed pea gravel, filter fabric, expansion joint materials, and concrete header edge restraint.

189. Permeable Concrete Pavers – 80mm, Color A, Item SPV.0165.1002; Color B, Item SPV.1065.1003.

A Description

This special provision describes furnishing and installing permeable concrete pavers in the roadway, terrace, and plaza areas, as shown on the Drawings. It includes cutting of the concrete pavers to fit and setting the concrete pavers as shown on the plans; as directed by the engineer, and as hereinafter provided.

Construction work includes the placement and setting of pavers and the addition of joint material between the pavers, and cleaning and protection of finished concrete unit paver joints and surfaces.

B Materials

Concrete Pavers:

Pavers shall conform to the following requirements set forth in ASTM C936:

- Measured length or width of test specimens shall not differ by more than +/- 0.063 in, while measured thickness shall not differ by more than +/- 0.125 in.
- Average compressive strength of 8,000 psi with no individual unit under 7,200 psi when tested according to ASTM C140.
- Average absorption of 5 percent with no unit greater than 7 percent when tested according to ASTM C140.
- For freeze-thaw testing, the average mass loss of all specimens tested shall not be greater than (A) 225 g/m2 when subject to 28 freeze thaw cycles, or (b) 500 g/m2 when subject to 49 freeze thaw cycles. Testing shall be conducted using a 3 percent saline solution in according to ASTM C1645.

Paver Type:

- Product: Belgard AquaLine L-stone Permeable Paver 12" X 12" X 80mm as shown on the Drawings, with chamfered edges and Texturegard Texture, smooth.
- Spacers: Duel positive –interlocking integrated bars.
- Joint/Void: Maximum 8mm non-structural voids.
- Appearance: Multi Cobble.
- Color A: 12" X 12" X 80mm - Graphite.
  Color B: 12" X 12" X 80mm - Foundry.
  Pigment in Concrete Pavers shall conform to ASTM C979.
- Processes: Smooth.
- Manufacturer: Northfield - an Oldcastle Company, Nate Gish 262-707-3974 or nate.gish@oldcastle.com.
- No substitutions allowed.

Joint Filling Materials: Crushed granite:

- Alliance Designer Products: Gator MAXX Polymeric Sand; Website: www.alliancegator.com.
- The Sakrete Companies: Website: www.sakrete.com.
- Color: Grey.

Paver Edging: Formed concrete header.

Shop Drawings: Indicate on Shop Drawings, layout pattern of pavers, layout of concrete header and adjacent curbing, dimensions of paved areas, control joints, expansion joints, elevations, and affected adjacent construction.

Product Data: Submit characteristics of paver unit, dimensions, and special shapes.

Samples: Submit two full-sized samples of paver to be used illustrating style, size, color range and surface texture.

Manufacturer's Installation Instructions: Submit substrate requirements, installation methods, and Material Safety Data sheets for the safe handling of the specified material and products

Mock-up:

- Install an 8 foot by 8 foot paver area mock-up for each paver type for approval by the engineer and owner.
- Use this mock-up area to determine joint sizes, lines, laying pattern(s), color(s) and texture of the work.
- Mock-up shall be a complete representation of completed concrete paver system installation including concrete pavers, joint filler, and base layers, and all related accessories.
- This area will be used as the standard by which the work will be judged.
- Subject to acceptance by engineer, mock-up may be retained as part of finished work.
- Any and all work performed without written approval of the mock-up from the engineer is at contractor's risk and may be subject to rejection.
- If mock-up is not accepted or not retained as part of the work, remove and dispose of all mock-up materials.

C Construction

Install the 6-inch concrete header, and base and aggregate for plaza areas as described in Wisconsin standard specification section 602 Concrete Sidewalks.

Concrete Paver System:

Verify that concrete pavers are free from dust, dirt, and stains. Do not use soiled, cracked, or broken paver units. Place and compact base layers evenly over prepared substrate surface to a maximum thickness as indicated on the Drawings. Dampen and roller compact to level

and even surface. Place paver units in pattern as indicated on Drawings from straight referenced edge and maintain a joint width of 5/16-inch at all vertical edges of each paver and at abutting vertical surfaces and protrusions. Maintain straight pattern lines evenly spaced, joint lines and coursing as indicated on the Drawings. Cut pavers to fit edges with a power saw. No cut paver shall be smaller than 1/3 of a whole unit if exposed to vehicular traffic.

Joint Filling:
After the pavers are installed, install joint filler in exact accordance with manufacturer's recommendations and only during proper exterior weather conditions. Remove all excess joint filler from site.

Tamp and level paver units with mechanical vibrator until units are firmly bedded, level, and to correct elevation and gradients. Do not tamp unrestrained edges. Recover with additional filler, sweep into joints and hollow areas of pavers. Remove excess filler.

The final surface tolerance from grade elevations shall not deviate more than plus or minus 3/8-inch under a 10-foot straightedge. Check final surface elevations for conformance to Drawings. The surface elevation of pavers shall be 1/8 inch to 1/4 inch above adjacent drainage inlets, concrete collars or channels. Lippage: No greater than 1/8 inch difference in height between adjacent pavers. Joint width between pavers shall not deviate more than plus or minus 1/8-inch.

Cleaning:
Prevent sediment and other debris from construction activities from entering the permeable paver areas. Do not clean pavers for a minimum of three days to ensure joints are fully set. Finished concrete paver surfaces shall be free of dirt, debris, stains and "hazing" in order to be deemed as acceptable. Any surface stains or hazing left on the pavers must be removed with appropriate paver cleaner. Clean finished concrete paver joints and paver surfaces according to the cleaner manufacturer's written requirements. Do not use abrasive cleaning tools that would damage finished joints and paver surfaces. Prior to installation, test paver cleaner in discreet area to verify paver surface or adjacent paving will not be damaged or discolored. Testing area shall be approved by the engineer or owner's representative prior to construction.

After work in this section is complete, the contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site. Do not permit traffic over unprotected paver surface for seven days. Protect with plywood sheeting as required by engineer or owner. Prior to final acceptance, vacuum/clean the finished permeable pavement system to remove any sediment deposited into the system during construction.

D Measurement
The department will measure Permeable Concrete Pavers (Color) in area by the square 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.0165.1002	Permeable Concrete Pavers – 80mm, Color A	SF
SPV.0165.1003	Permeable Concrete Pavers – 80mm, Color B	SF

Payment is full compensation for furnishing and installing Permeable Concrete Pavers.

190. Prestressed Precast Concrete Wall Panel, Item SPV.0165.2001.

A Description

This special provision describes constructing precast prestressed concrete wall panels with heights and patterns as shown on the plans including product design, fabrication, transportation, erection, anchorage 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 according to the AASHTO LRFD Bridge Design Specifications for Highway Bridges, 6th 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 506
Elastomeric Bearing Pads.....standard spec 506

Galvanize or furnish stainless steel materials for all hardware incorporated into the finished structures. (Not including reinforcement bars or pretensioning reinforcement.)

B.2 Concrete

Furnish concrete as specified in standard spec 501 and 716.

Ensure concrete attains a minimum 28-day compressive strength of 5,000 pounds per square inch (psi). 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.

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 precast 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.

Determine proportions for the mix within the following limitations:

Water cement ratio	not greater than 0.45
Cement content, pounds per cubic yard of concrete	610 minimum
Air content of concrete, percent maximum	3.5-6.0
Slump of mixed concrete, maximum	4 inches

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 at their option if the ambient air temperature is less than 70 degrees F (21 degrees C).

Do not add more admixtures or water after mixing is complete.

Use admixtures that do not have significant chlorides or chlorides added during manufacture.

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 prestressed concrete wall panels from fabrication plants that comply with the department's plant certification program for precast prestressed 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.

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 14.7.6.2 of the AASHTO LRFD Bridge Design Specifications.
- 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 and construct the walls according to the lines, grades, heights and dimensions shown on the plans, as herein specified, and as directed by the department.

Design panels and components to withstand initial handling, transportation, and erection stress limits; dead loads; wind load of 40 pounds per square foot; suction load of 20 pounds per square foot; structural backfill in cavity to 42 inches above finished grade; 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.

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 a panel anchor 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.

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.

Design modifications may be 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.

Submit to the engineer, for acceptance and placing on file before commencing, one set of the submittals that the contractor has checked. In addition, provide two sets to the Region office, Carolynn Gellings, (262) 548–8716, and one set to the Bureau of Structures for acceptance and inspection purposes. Only after acceptance by the Region may fabrication of panels begin. 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 acceptance, 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 acceptance, make no deviation from the production drawings or changes to them without the engineer’s further review and acceptance.

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 Excavation and Backfill

Excavation will encompass the preparation of the foundation below the leveling pad and to the limits and extents as shown on the plans, according 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 of the wall.

C.4 Sample Panel
Produce one standard sample panel for acceptance of color and texture. Deliver test panel(s) to the Lake Freeway Construction Field Office or an alternate location within the Lake Freeway project limits designated by the engineer. Before any final panels are produced the 4 x 4 foot sample panel shall be reviewed and accepted by the engineer. If the panel is not acceptable, a second panel shall be produced and submitted for acceptance. The accepted sample panel shall remain on site and be the reference standard of quality for precast panel work on the project.

When decorative mural or relief patterns are shown on the plans and required to be cast into the face of the panels different from the general form liner surface texture or treatment, provide additional decorative relief pattern sample panels per paragraph C.9.2.

C.5 Stressing Procedure
Stressing procedure shall be according 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.6 Placing and Fastening Steel
Placing and fastening steel shall be according 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.7 Placing Concrete
Handle and place the concrete as specified in standard spec 502.

C.8 Tolerances
Cast architectural precast concrete panels to plan dimensions within the following applicable tolerances:

Overall height of panel measured at the face exposed to view	±3/16-inch per 10 ft.
Overall width of panel measured at the face exposed to view	±3/16-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.9 Curing
Cure concrete according to standard spec 503.3.2.2.

C.10 Surface Finish
Provide decorative surface treatment as detailed in 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 panel. 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.10.1 Decorative Relief Patterns
When shown on the plans, provide prestressed precast panels with decorative relief murals or patterns 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, Carolynn Gellings, P.E., 141 NW Barstow Street, Waukesha, Wisconsin 53187, (262) 548-8716.

C.10.2 Decorative Relief Pattern Sample Panels
When the plans call for prestressed precast panels with decorative relief patterns, supply to the engineer a minimum of two non-production test panels with the decorative details as shown in the plans. Deliver test panel(s) to the Construction Field Office or an alternate location within the Lake Freeway project limits designated by the engineer. 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 murals or patterns 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.11 Erection

Erect panels without damage to shape or finish. Replace or repair damaged panels. Do not drill or form holes through the precast prestressed wall facing panels to erect panels. An alternate method of anchoring/attaching the precast prestressed concrete wall panels may be submitted to the engineer for review and possible acceptance.

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. Place a 2 foot wide layer of Geotextile Fabric Type DF over the joint between the tilt up panel and the panel footing as shown on the plans. Shim vertical joints to get proper opening. Install and compress neoprene joint filler in the lap joints between panels. Fasten top of panels to anchor slab assemblies at walls and abutments, as shown on the plans.

Touch-up scratched or damaged galvanized surfaces.

C.12 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 ..... ± 1/4-inch

C.13 Adjusting

Adjust panels so joint dimensions are within tolerances.

D Measurement

The department will measure Prestressed Precast Concrete Wall Panel 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 plan quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.2001	Prestressed Precast Concrete Wall Panel	SF

Payment is full compensation for preparing the design drawings and calculations, production drawings, and coordination; for providing concrete and reinforcement steel for the cast-in-place concrete footings and copings, decorative surface finish, sample panels, prestressed precast wall panels, including all concrete, grout, mortar, reinforcement steel, tie bars, bearing pads, geotextile fabric Type DF, excavation, shims, masonry anchors, filler, anchor plates, angles, unistrut and anchor assemblies, slotted inserts and other embedded metal; for casting and curing concrete; for jacking and prestressing. Anchor blocks, rods, couplers and clevises shall be produced and supplied to the job site under this item. Parapets, railings, abutment bodies, and other items above the wall panel cap or coping will be paid for separately. Backfill Granular will be paid for separately.

191. Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP, Item SPV.0165.2002.

A Description

This special provision describes designing, furnishing materials and erecting a permanent earth retention system according 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 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, 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://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/rdwy/default.aspx

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 according 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 contacting Leon J Schuchardt at (608) 266-8494 (lee.schuchardt@dot.wi.gov).

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 according to Table11.5.6-1 LRFD.

Design and construct the walls according 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 according 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.

The design of the Concrete Panel Mechanically Stabilized Earth Wall by the contractor shall consider the internal and compound stability of the wall mass according 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 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 according 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 according 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 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 II Concrete.

The minimum embedment to the top of the leveling pad shall be 1 foot 6 inches or as given on the contract plan. 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 Concrete Panel MSE Walls as shown on the plans and as hereinafter provided.

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 foundry sand, bottom ash, blast furnace slag, crushed/recycled concrete, crushed/milled asphaltic concrete or other potentially corrosive material.

Provide material conforming 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.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 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 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 according 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, 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.

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:

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. 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 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 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.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 Decorative Surface Finish

C.4.1 Form Liner Pattern

When shown on the plans, provide a decorative form lined surface on the exposed face of wall panels. The decorative wall pattern shall be as shown on the contract plans.

C.4.2 Sample Panels

When the plans call for a decorative surface finish treatment, supply to the engineer a minimum of three 5'x5' test panels with the decorative surface finish treatment as called for in the plans and herein specified. The submitted test panels shall fit together to demonstrate the continuation of the decorative surface finish across horizontal and vertical panel joints. Obtain the engineer's acceptance of the decorative surface finish test panels, prior to production of the decorative surface patterned panels required for the contract. Only one set of accepted decorative surface finish test panels per contract is required.

After acceptance of the decorative surface finish treatment, the test panels may be used for test staining as required in the contract special provision "Concrete Staining."

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 Soils Engineer two working days to review the foundation.

D Measurement

The department will measure Wall Concrete Panel Mechanically Stabilized Earth Wall 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 plan quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.2002	Wall Concrete Panel Mechanically Stabilized Earth LRFD/QMP	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 decorative surface finish, cap and copings; constructing the retaining system including drainage system; providing backfill, backfilling, compacting, developing/completing/documenting the quality management program, and for performing 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.

192. Wall Wire Faced Mechanically Stabilized Earth LRFD/QMP, Item SPV.0165.2003.

A Description

This special provision describes designing, furnishing materials and erecting a permanent earth retention system according 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 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, 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://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/rdwy/default.aspx

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 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 according 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 according to Table 11.5.6-1 LRFD.

Design and construct the walls according 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 according 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 according 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 according 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

All steel components of permanent Wire-Faced MSE walls shall be galvanized according to ASTM A-123. Provide steel reinforcement that meets the following requirements:

- 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 according to ASTM A-185. A minimum galvanization coating of 2 oz/ft^2 or 3.4 mils thickness is required. 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.

- 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 and galvanized to a minimum thickness of 3.4 mils. Tie strips shall be shop fabricated of hot-rolled steel meeting the requirements of ASTM A-1011 Grade 50.

- 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 according 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.

- Fasteners

Galvanized high strength bolts meeting the requirements of AASHTO M164 or equivalent.

- Connector Pins and Mat Bars

Connector pins and mat bars fabricated from cold drawn steel wire meeting the requirements of ASTM A-82 and galvanized to according to ASTM 123 to a minimum thickness of 3.4 mils.

- Metallic Screen

Provide a stainless steel or galvanized steel metallic screen per AASHTO M-111. The metallic screen should have an approximate opening of ¼" and be made of 0.025" (minimum) gauge wire.

B.3.2 Geotextile Filter Fabric

Geotextile filter fabric shall be used behind the metallic screen. 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.

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 Wire-Faced Mechanically Stabilized Earth wall shall be according 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 is 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 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 obstruction 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.

C2 Tolerances

- The overall vertical tolerance of the wall and the horizontal alignment tolerance shall not exceed 2 inches per 10 feet for permanent installations.

- Where a cast-in-place facing or a precast concrete panel facing is installed, the overall vertical tolerance shall not exceed ±1 inch or as shown on the contract plans.

- For battered wire facing, the final deviation from the design batter shall be within ±3/4 inch for each 10 feet of battered wall height.

- The offset limit between consecutive rows of facing shall not exceed 1 inch.

C3 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. 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 Wire Faced Mechanically Stabilized Earth Wall 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 plan quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.2003	Wall Wire Faced Mechanically Stabilized Earth LRFD/QMP	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. 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.
(20140716)

193. Shredded Hardwood Bark Mulch, Item SPV.0180.1001.

A Description
This special provision describes furnishing and installing Shredded Hardwood Bark Mulch as shown on the plans, and as hereinafter provided. Minimum mulch thickness to be 3-inches.

B Materials
Shredded Hardwood Bark Mulch shall be natural, shredded hardwood bark mulch, free of growth or germination inhibiting ingredients, and shall be no larger than 4-inches in any dimension, and suitable for top dressing of planting beds. No artificial coloration shall be added.

Samples: Submit sample demonstrating color, size and properties to engineer, for approval prior to construction.

C Construction
The installation of the Shredded Hardwood Bark Mulch shall be according to the plans and details. Keep mulch minimum 2-inches away from all tree stems, woody stems and herbaceous shoots.

D Measurement
The department will measure Shredded Hardwood Bark Mulch by square yard of material, 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.0180.1001	Shredded Hardwood Bark Mulch	SY

Payment is full compensation for furnishing and installing all Shredded Hardwood Bark Mulch.

194. Management of Solid Waste, Item SPV.0195.1001.

A General

A.1 Description

This work will conform with the requirements of standard spec 205; 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.

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 as petroleum-contaminated soil will be managed as solid waste.

This work consists of excavating, segregating, temporary stockpiling, loading, hauling, and disposing of solid waste material at a WDNR-approved disposal facility. The nearest WDNR-approved disposal facilities are:

Advanced Disposal Emerald Park Landfill
W124 S10629 124th St.
Muskego, Wisconsin 53150
(414) 529-1360

Waste Management Orchard Ridge Landfill
N96 W13503 County Line Road
Menomonee Falls, WI 53051
(262) 253-8620

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 – Solid Waste and Contaminated Groundwater Locations

The department and others completed hazardous materials assessment for locations within this project where excavation is required. Investigation for soil and groundwater contamination was conducted at select locations. Results indicate that solid waste and groundwater contamination is present at the following locations as shown on the plans:

- Station 12+00 LM to 16+00 LM, from project limits left to project limits right from 0 to 6+ feet bgs. Approximately 1,225 cubic yards (approximately 2,082 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer and grading. Groundwater at this location may be contaminated with petroleum, metals and cyanide.

- Station 23+50 LM to 31+80 LM, from approximately project limits left to 75 feet right of reference line from 0 to 35+ feet bgs. Approximately 1,407 cubic yards (approximately 2,393 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer and grading. Groundwater at this location may be contaminated with petroleum, metals and cyanide.
- Station 31+80 LM to 35+10 LM, from project limits left to 15 feet right of reference line, from 0 to 8+ feet bgs. Approximately 201 cubic yards (approximately 342 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer and grading. Groundwater at this location likely contains elevated petroleum and metals concentrations.
- Station 418+00 LN to 426+75 LN, from approximately 30 feet left of reference line to project limits right, from 0 to 8+ feet bgs. Approximately 66 cubic yards (approximately 113 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer, retaining wall, and grading. Groundwater at this location may be contaminated with petroleum, metals, and cyanide.
- Station 21+00 CL to 31+00 CL, from project limits left to project limits right, from 0 to 14+ feet bgs. Approximately 7,724 cubic yards (approximately 13,132 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer and grading. Groundwater at this location likely contains elevated petroleum and metals concentrations.
- Station 100+50 LW to 111+00 LW, from project limits left to project limits right, from 0 to 16+ feet bgs. Approximately 2,468 cubic yards (approximately 4,196 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer, bridge footings, and grading. Groundwater at this location likely contains elevated petroleum and metals concentrations.
- Station 201+00 LE to 210+00 LE, from project limits left to project limits right, from 0 to 16+ feet bgs. Approximately 2,578 cubic yards (approximately 4,384 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer, retaining wall, bridge abutment, bridge footings, and grading. Groundwater at this location likely contains elevated petroleum and metals concentrations.
- Station 327+85 LS to 331+00 LS, from project limits left to 40 feet right of reference line, from 0 to 16+ feet bgs. Approximately 359 cubic yards (approximately 611 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of storm sewer, retaining wall, and grading. Groundwater at this location likely contains elevated petroleum and metals concentrations.
- Retaining wall R-40-629 and bridge piers. Approximately 966 cubic yards (approximately 1,642 tons at an estimated 1.7 tons per cubic yard) of non-exempt solid waste will be excavated from this area for the installation of the retaining wall and bridge piers for the new ramps. Groundwater at this location likely contains elevated petroleum and metals concentrations.

Directly load fill with 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 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.

If dewatering is required at the above locations, conduct the dewatering according to Section C below.

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:	Andrew Malsom
Address:	141 NW Barstow Street, Waukesha, WI 53187-0798
Phone:	(262) 548-6705
Fax:	(262) 548-6891
e-mail:	andrew/malsom@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) 901-2126, (262) 901-2142
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 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 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 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 solid waste fill described in A.2 to the environmental consultant. Identify the WDNR licensed landfill facility that will be used for disposal of solid waste, and provide this information to the environmental consultant no later than 30 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 solid waste.

Coordinate with the environmental consultant to ensure that the environmental consultant is present during excavation in the impacted area. Notify the environmental consultant at least three calendar days prior to commencement of excavation in the impacted area. Perform excavation in the impacted area on a continuous basis until excavation work is completed. Do not transport soil containing solid waste offsite without prior approval from the environmental consultant.

A.5 Health and Safety Requirements
Add the following to standard spec 107.1:

During excavation activities, expect to encounter 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
Add the following to standard spec 205.3:

Control operations in the impacted area to minimize the quantity of soil excavated.

The environmental consultant will periodically monitor soil excavated from the area 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 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 according to applicable state and federal regulations. Obtain the necessary disposal facility approvals and WDNR approvals for disposal. Do not transport 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 areas of known contamination, water generated from dewatering activities will likely contain VOCs, metals, and possibly cyanide (near Summerfest Grounds). Such water may, with approval of the Milwaukee Metropolitan Sewerage District (MMSD), be discharged to the sanitary sewer as follows:

- Meet all applicable requirements of the MMSD including the control of suspended solids. Perform all necessary monitoring to document compliance with MMSD's requirements. Furnish, install, operate, maintain, disassemble, and remove treatment equipment necessary to comply with MMSD's requirements.
- Ensure continuous dewatering and excavation safety at all times. Provide, operate, and maintain adequate pumping equipment and drainage and disposal facilities.

Notify the engineer of any dewatering activities, and obtain any permits necessary to discharge water. Provide copies of such permits to the engineer. 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 regulated solid waste from this construction project.

D Measurement

The department will measure Management of Solid Waste by the ton of waste accepted by the disposal facility and as documented by weight tickets, 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.0195.1001	Management of Solid Waste	Ton

Payment is full compensation for excavating, segregating, loading, hauling, and landfill disposal of 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 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 PROVISION 6
ASP 6 - Modifications to the standard specifications

Make the following revisions to the standard specifications:

450.3.2.1 General

Replace the entire text with the following effective with the January 2015 letting:

(1) Do not place asphaltic mixture when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 36 F for upper layers or 32 F for lower layers unless the engineer allows in writing. The contractor should place HMA pavement for projects on or north of STH 29 between May 1 and October 15 inclusive and for projects south of STH 29 between April 15 and November 1 inclusive. Notify the engineer at least one business day before paving.

(2) Unless the contract specifies otherwise, conform to the following:

- Keep the road open to all traffic during construction.
- Prepare the existing foundation for treatment as specified in 211.
- Incorporate loose roadbed aggregate as a part of preparing the foundation, in shoulder construction, or dispose of as the engineer approves.

(3) Place asphaltic mixture only on a prepared, firm, and compacted base, foundation layer, or existing pavement substantially surface-dry and free of loose and foreign material. Do not place over frozen subgrade or base, or where the roadbed is unstable.

450.5 Payment

Replace the entire text with the following effective with the May 2015 letting:

(1) All costs of furnishing, maintaining, and operating the truck scale or other weighing equipment and furnishing the weigh tickets are incidental to the contract.

(2) Nonconforming material allowed to remain in place is subject to price adjustment under 105.3.2.

(3) Full-depth sawing to remove integrally placed safety edge where not required is incidental to the contract.

(4) The contractor is responsible for the quality of HMA pavement placed in cold weather. If because of an excusable compensable delay under 108.10.3, the engineer directs the contractor to pave when the temperature is less than 36 F for the upper layer or less than 32 F for lower layers, the department:

- Will relieve the contractor of responsibility for damage and defects the engineer attributes to cold weather paving.
- Will not assess disincentives for density or ride.

455.3.2.1 General

Replace the paragraphs one and two with the following effective with the January 2015 letting:

(1) Apply tack coat only when the air temperature is 32 F or more unless the engineer approves otherwise in writing. Before applying tack coat ensure that the surface is dry and reasonably free of loose dirt, dust, or other foreign matter. Do not apply if weather or surface conditions are unfavorable or before impending rains.

(2) Use tack material of the type and grade the contract specifies. The contractor may, with the engineer's approval, dilute tack material as allowed under 455.2.4. Provide calculations using the asphalt content as-received from the supplier and subsequent contractor dilutions to show that as-placed material has 50 percent or more residual asphalt content. Apply at 0.050 to 0.070 gallons per square yard, after dilution, unless the contract designates otherwise. The engineer may adjust the application rate based on surface conditions. Limit application each day to the area the contractor expects to pave during that day.

460.2.2.3 Aggregate Gradation Master Range

Replace paragraph one with the following effective with the December 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-0.3 and E-3 mixes.

[2] 15.5 for E-0.3 and E-3 mixes.

460.3.4 Cold Weather Paving

Add a new subsection as follows effective with the May 2015 letting:

460.3.4 Cold Weather Paving

460.3.4.1 Cold Weather Paving Plan

(1) Submit a written cold weather paving plan to the engineer at the preconstruction meeting. In that plan outline material, operational, and equipment changes for paving when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 40 F. Include the following:

- Use a department-accepted HMA mix design that incorporates a warm mix additive from the department's approved products list. Do not use a foaming process that introduces water into the mix.
- Use additional rollers.

(2) Engineer written acceptance is required for the cold weather paving plan. Engineer acceptance of the plan does not relieve the contractor of responsibility for pavement performance except as specified in 450.5(4).

460.3.4.2 Cold Weather Paving Operations

(1) Do not place asphaltic mixture when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 40 F unless a valid engineer-accepted cold weather paving plan is in effect.

(2) If the national weather service forecast for the construction area predicts ambient air temperature less than 40 F at the projected time of paving within the next 24 hours, confirm or submit revisions to a previously engineer-accepted cold weather paving plan for engineer validation. Upon validation of the plan, the engineer will allow paving for the next day. Once in effect, pave conforming to the engineer-accepted cold weather paving plan for the balance of that work day or shift regardless of the temperature at the time of paving.

460.4 Measurement

Add paragraph two as follows effective with the January 2015 letting:

(2) The department will measure HMA Cold Weather Paving by the ton of HMA mixture for pavement placed conforming to an engineer-accepted cold weather paving plan.

460.5.1 General

Revise paragraph one as follows effective with the January 2015 letting:

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
460.1100	HMA Pavement Type E-0.3	TON
460.1101	HMA Pavement Type E-1	TON
460.1103	HMA Pavement Type E-3	TON
460.1110	HMA Pavement Type E-10	TON
460.1130	HMA Pavement Type E-30	TON
460.1132	HMA Pavement Type E-30X	TON
460.1700	HMA Pavement Type SMA	TON
460.2000	Incentive Density HMA Pavement	DOL
460.4000	HMA Cold Weather Paving	TON

460.5.2.2 Disincentive for HMA Pavement Density

Revise paragraph two as follows effective with the January 2015 letting:

(2) The department will not assess density disincentives for pavement placed in cold weather because of a department-caused delay as specified in 450.5(4).

460.5.2.4 Cold Weather Paving

Add a new subsection as follows effective with the May 2015 letting:

460.5.2.4 Cold Weather Paving

(1) Payment for HMA Cold Weather Paving is full compensation for additional materials and equipment specified for cold weather paving under 460.3.4 including costs for preparing, administering, and following the contractor's cold weather paving plan. The department will not pay for HMA Cold Weather Paving for HMA placed on days when the department is assessing liquidated damages.

(2) If HMA pavement is placed under 460.3.4 and the HMA Cold Weather Paving bid item is not in the contract, the department will pay for the additional costs specified in 460.5.2.4(1) as extra work. The department will pay separately for HMA pavement under the appropriate HMA Pavement bid items.

465.2 Materials

Replace paragraph two with the following effective with the December 2014 letting:

(2) Under the other 465 bid items, the contractor need not submit a mix design. Furnish aggregates mixed with a type AC asphaltic material, except under the Asphaltic Curb bid item furnish PG58-28 asphaltic material. Use coarse and fine mineral aggregates uniformly coated and mixed with the asphaltic material in an engineer-approved mixing plant. The contractor may include reclaimed asphaltic pavement materials in the mixture.

506.3.2 Shop Drawings

Replace the entire text with the following effective with the May 2015 letting:

(1) Ensure that shop drawings conform to the contract plans and provide additional details, dimensions, computations, and other information necessary for completely fabricating and erecting the work. Include project and structure numbers on each shop drawing sheet.

(2) Check shop drawings and submit electronically to the department for review before beginning fabrication. For primary fabrication items, also certify that shop drawings conform to quality control standards by submitting department form DT2333. Department review does not relieve the contractor from responsibility for errors or omissions on shop drawings.

(3) Shop drawings are part of the contract. The department must approve differences between shop drawings and contract plans. The contractor bears the costs of department-approved substitutions. Do not deviate from or revise drawings without notifying the department and resubmitting revised drawings.

(4) Ensure that the fabricator delivers 3 sets of shop drawings for railroad structures to the railroad company upon contract completion.

Bid Items Added

Add the following new bid item effective with the January 2015 letting:

ITEM NUMBER	DESCRIPTION	UNIT
460.4000	HMA Cold Weather Paving	TON

Errata

Make the following corrections to the standard specifications:

501.3.2.4.4 Water Reducer

Correct errata by deleting the reference to footnote 6 for grade D concrete.

(1) Add a water reducing admixture conforming to 501.2.3. Determine the specific type and rate of use based on the atmospheric conditions, the desired properties of the finished concrete and the manufacturer's recommended rate of use. The actual rate of use shall at least equal the manufacturer's recommended rate, and both the type and rate used require the engineer's approval before use.

506.5 Payment

Correct errata by changing the reference to 506.3.22.

(9) The department will limit costs for inspections conducted under 506.3.22 to $0.05 per pound of material and deduct costs in excess of that amount from payment due the contractor. The department will determine costs for in-house inspections based on hourly rates for department staff plus overhead and use invoiced costs for contracted-out inspections. The department will administer deductions for the contractor's share of the total inspection cost under the Excess Costs For Fabrication Shop Inspection administrative item.

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://wisconsindot.gov/Pages/doing-bus/civil-rights/labornwage/default.aspx

(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://wisconsindot.gov/Documents/doing-bus/civil-rights/labornwage/crcs-payroll-manual.pdf

Effective August 2015 letting

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://wisconsindot.gov/rdwy/cmm/cm-02-28.pdf

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://wisconsindot.gov/rdwy/worksheets/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, 2015

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	35.37	17.99	53.36
Carpenter	33.68	19.99	53.67
Cement Finisher	32.75	19.21	51.96
Future Increase(s): 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	33.93	22.77	56.70
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	23.73	19.09	42.82
Ironworker	30.77	23.97	54.74
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.			
Line Constructor (Electrical)	37.43	18.19	55.62
Painter	29.22	16.69	45.91
Pavement Marking Operator	30.27	18.79	49.06
Piledriver	30.11	26.51	56.62
Future Increase(s): Add $1.50/hr on 6/1/2015; Add $1.60/hr on 6/1/2016. Premium Pay: Add $.65/hr for Piledriver Loftsman; Add $.75/hr for Sheet Piling Loftsman. 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.			
Roofer or Waterproofer	29.40	17.05	46.45
Teledata Technician or Installer	24.89	17.15	42.04
Tuckpointer, Caulker or Cleaner	33.76	17.82	51.58

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	$	$	$
Underwater Diver (Except on Great Lakes)	35.40	15.90	51.30
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	35.55	15.57	51.12
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	31.60	14.64	46.24
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	27.65	13.44	41.09
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	25.68	12.83	38.51
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	21.75	11.63	33.38
TRUCK DRIVERS			
Single Axle or Two Axle	25.18	18.31	43.49
Future Increase(s): Add $1.15/hr on 6/1/2015. 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.			
Three or More Axle	25.28	18.31	43.59
Future Increase(s): Add $1.15/hr on 6/1/2015. 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.			
Articulated, Euclid, Dumptor, Off Road Material Hauler	30.27	21.15	51.42
Future Increase(s): 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.			
Pavement Marking Vehicle	23.16	17.13	40.29
Shadow or Pilot Vehicle	24.37	17.77	42.14
Truck Mechanic	24.52	17.77	42.29
LABORERS			
General Laborer	27.06	20.03	47.09
Future Increase(s): Add $1.05/hr eff. 06/01/2015; Add $1.00/hr eff. 06/01/2016; Add $1.00/hr eff. 06/01/2017 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	22.05	18.41	40.46
Landscaper	27.06	20.03	47.09
Future Increase(s): Add $1.05/hr eff. 06/01/2015; Add $1.00/hr eff. 06/01/2016; Add $1.00/hr eff. 06/01/2017 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 $1.25/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	19.37	41.92

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	$	$	$
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	17.71	16.01	33.72
Railroad Track Laborer	14.50	4.39	18.89
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 $1.25/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.	37.72	21.15	58.87
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 $1.25/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.	37.22	21.15	58.37
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);	36.72	21.15	57.87

TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY	HOURLY FRINGE BENEFITS	TOTAL
	$	$	$
Tube Finisher; Tugger (NOT Performing Work on the Great Lakes); Winches & A- Frames. Future Increase(s): 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 $1.25/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.	36.46	21.15	57.61
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 $1.25/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.	36.17	21.15	57.32
Fiber Optic Cable Equipment.	28.89	17.95	46.84
Work Performed on the Great Lakes Including Diver; Wet Tender or Hydraulic Dredge Engineer.	41.65	21.71	63.36
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.	41.65	21.71	63.36
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.	35.72	17.85	53.57
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.	35.46	20.40	55.86

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SECTION 0001 WISDOT ITEMS					
0010	201.0110 Clearing	7,790.000 SY		.		.
0020	201.0120 Clearing	739.000 ID		.		.
0030	201.0210 Grubbing	7,790.000 SY		.		.
0040	201.0220 Grubbing	739.000 ID		.		.
0050	203.0200 Removing Old Structure (station) 2001. 100+66 LW	LUMP	LUMP			.
0060	203.0200 Removing Old Structure (station) 2002. 102+00 LW	LUMP	LUMP			.
0070	203.0200 Removing Old Structure (station) 2003. 104+00 LW 135' LT	LUMP	LUMP			.
0080	203.0200 Removing Old Structure (station) 2004. 200+85 LE	LUMP	LUMP			.
0090	203.0200 Removing Old Structure (station) 2005. 202+00 LE	LUMP	LUMP			.
0100	203.0200 Removing Old Structure (station) 2006. 203+25 LE 30' LT	LUMP	LUMP			.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0110	203.0200 Removing Old Structure (station) 2007. 328+00 LS	LUMP	LUMP			.
0120	203.0200 Removing Old Structure (station) 2008. 419+90 LN	LUMP	LUMP			.
0130	203.0200 Removing Old Structure (station) 2009. 423+40 LN	LUMP	LUMP			.
0140	203.0210.S Abatement of Asbestos Containing Material (structure) 2001. B-40-400-1D	LUMP	LUMP			.
0150	203.0210.S Abatement of Asbestos Containing Material (structure) 2002. B-40-400-1E	LUMP	LUMP			.
0160	203.0210.S Abatement of Asbestos Containing Material (structure) 2003. B-40-400-1F	LUMP	LUMP			.
0170	203.0210.S Abatement of Asbestos Containing Material (structure) 2005. B-40-400-3D	LUMP	LUMP			.
0180	203.0210.S Abatement of Asbestos Containing Material (structure) 2006. B-40-400-3E	LUMP	LUMP			.
0190	203.0210.S Abatement of Asbestos Containing Material (structure) 2007. B-40-400-5E	LUMP	LUMP			.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0200	203.0210.S Abatement of Asbestos Containing Material (structure) 2008. B-40-400-6C	LUMP	LUMP			.
0210	203.0210.S Abatement of Asbestos Containing Material (structure) 2009. B-40-400-6D	LUMP	LUMP			.
0220	203.0225.S Debris Containment (structure) 2001. B-40-915	LUMP	LUMP			.
0230	203.0225.S Debris Containment (structure) 2002. B-40-916	LUMP	LUMP			.
0240	203.0225.S Debris Containment (structure) 2003. B-40-400-1D	LUMP	LUMP			.
0250	203.0225.S Debris Containment (structure) 2004. B-40-400-1E	LUMP	LUMP			.
0260	203.0225.S Debris Containment (structure) 2005. B-40-400-3D	LUMP	LUMP			.
0270	203.0225.S Debris Containment (structure) 2006. B-40-400-3E	LUMP	LUMP			.
0280	203.0225.S Debris Containment (structure) 2007. B-40-400-3C	LUMP	LUMP			.
0290	203.0225.S Debris Containment (structure) 2008. B-40-400-6C	LUMP	LUMP			.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0300	203.0225.S Debris Containment (structure) 2009. B-40-400-6D	LUMP	LUMP			.
0310	204.0100 Removing Pavement **P**	11,634.000 SY		.		.
0320	204.0115 Removing Asphaltic Surface Butt Joints	88.000 SY		.		.
0330	204.0150 Removing Curb & Gutter **P**	2,529.000 LF		.		.
0340	204.0155 Removing Concrete Sidewalk **P**	3,970.000 SY		.		.
0350	204.0157 Removing Concrete Barrier **P**	235.000 LF		.		.
0360	204.0170 Removing Fence **P**	5,542.000 LF		.		.
0370	204.0195 Removing Concrete Bases	3.000 EACH		.		.
0380	204.0210 Removing Manholes	14.000 EACH		.		.
0390	204.0220 Removing Inlets	68.000 EACH		.		.
0400	204.0245 Removing Storm Sewer (size) 1001. 6-INCH	716.000 LF		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0410	204.0245 Removing Storm Sewer (size) 1002. 8-INCH	36.000 LF		.		.
0420	204.0245 Removing Storm Sewer (size) 1003. 10-INCH	487.000 LF		.		.
0430	204.0245 Removing Storm Sewer (size) 1004. 12-INCH	2,087.000 LF		.		.
0440	204.0245 Removing Storm Sewer (size) 1005. 15-INCH	613.000 LF		.		.
0450	204.0245 Removing Storm Sewer (size) 1006. 18-INCH	639.000 LF		.		.
0460	204.0245 Removing Storm Sewer (size) 1007. 21-INCH	56.000 LF		.		.
0470	204.0245 Removing Storm Sewer (size) 1008. 24-INCH	1,290.000 LF		.		.
0480	204.0245 Removing Storm Sewer (size) 1009. 36-INCH	230.000 LF		.		.
0490	204.0280 Sealing Pipes	10.000 EACH		.		.
0500	204.9060.S Removing (item description) 0001. BOLLARDS	24.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0510	204.9060.S Removing (item description) 0002. TRAFFIC CONTROL SIGNS FIXED MESSAGE LEFT IN PLACE BY OTHERS	6.000 EACH		.		.
0520	204.9090.S Removing (item description) 0003. CONCRETE BARRIER TEMPORARY PRECAST LEFT IN PLACE BY OTHERS	87.500 LF		.		.
0530	205.0100 Excavation Common	74,724.000 CY		.		.
0540	205.0501.S Excavation, Hauling, and Disposal of Petroleum Contaminated Soil	9,369.000 TON		.		.
0550	205.2000.S Settlement Gauges	2.000 EACH		.		.
0560	206.1000 Excavation for Structures Bridges (structure) 2001. B-40-915	LUMP	LUMP			.
0570	206.1000 Excavation for Structures Bridges (structure) 2002. B-40-916	LUMP	LUMP			.
0580	208.0100 Borrow	1,516.000 CY		.		.
0590	213.0100 Finishing Roadway (project) 0001. 1300-13-74	1.000 EACH		.		.

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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
0600	305.0120 Base Aggregate Dense 1 1/4-Inch **P**	17,474.000 TON		.		.
0610	310.0110 Base Aggregate Open Graded	543.000 TON		.		.
0620	311.0110 Breaker Run	14,624.000 TON		.		.
0630	415.0070 Concrete Pavement 7-Inch **P**	5,339.000 SY		.		.
0640	415.0075 Concrete Pavement 7 1/2-Inch **P**	8,698.000 SY		.		.
0650	415.0080 Concrete Pavement 8-Inch **P**	15,760.000 SY		.		.
0660	415.0085 Concrete Pavement 8 1/2-Inch **P**	323.000 SY		.		.
0670	415.0210 Concrete Pavement Gaps	10.000 EACH		.		.
0680	415.0410 Concrete Pavement Approach Slab **P**	291.000 SY		.		.
0690	416.0170 Concrete Driveway 7-Inch	1,016.000 SY		.		.
0700	416.0610 Drilled Tie Bars	77.000 EACH		.		.

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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
0710	416.0620 Drilled Dowel Bars	64.000 EACH		.		.
0720	416.1010 Concrete Surface Drains	4.000 CY		.		.
0730	440.4410.S Incentive IRI Ride	5,400.000 DOL	1.00000		5400.00	
0740	455.0605 Tack Coat	168.000 GAL		.		.
0750	465.0105 Asphaltic Surface	1,318.000 TON		.		.
0760	465.0125 Asphaltic Surface Temporary	407.000 TON		.		.
0770	465.0310 Asphaltic Curb	270.000 LF		.		.
0780	502.0100 Concrete Masonry Bridges **P**	927.000 CY		.		.
0790	502.0717.S Crack Sealing Epoxy	30.000 LF		.		.
0800	502.3100 Expansion Device (structure) 2001. B-40-400-6D	LUMP	LUMP			.
0810	502.3100 Expansion Device (structure) 2002. B-40-915	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
0820	502.3100 Expansion Device (structure) 2003. B-40-916	LUMP	LUMP			.
0830	502.3200 Protective Surface Treatment **P**	7,498.000 SY		.		.
0840	502.3210.S Pigmented Protective Surface Treatment	1,714.000 SY		.		.
0850	502.6500 Protective Coating Clear	3.000 GAL		.		.
0860	503.0136 Prestressed Girder Type I 36-Inch **P**	354.000 LF		.		.
0870	504.0500 Concrete Masonry Retaining Walls **P**	1,198.000 CY		.		.
0880	505.0405 Bar Steel Reinforcement HS Bridges **P**	52,550.000 LB		.		.
0890	505.0605 Bar Steel Reinforcement HS Coated Bridges **P**	447,560.000 LB		.		.
0900	505.0615 Bar Steel Reinforcement HS Coated Retaining Walls **P**	132,350.000 LB		.		.
0910	505.0800.S Bar Steel Reinforcement HS Stainless Structures **P**	1,520.000 LB		.		.
0920	506.0605 Structural Steel HS **P**	1,391,929 LB		.		.

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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
0930	506.2605 Bearing Pads Elastomeric Non-Laminated	12.000 EACH		.		.
0940	506.3015 Welded Stud Shear Connectors 7/8x6-Inch **P**	10,248.000 EACH		.		.
0950	506.4000 Steel Diaphragms (structure) 2001. B-40-916 **P**	5.000 EACH		.		.
0960	509.0301 Preparation Decks Type 1	504.000 SY		.		.
0970	509.0302 Preparation Decks Type 2	201.000 SY		.		.
0980	509.0500 Cleaning Decks	3,292.000 SY		.		.
0990	509.1000 Joint Repair	79.000 SY		.		.
1000	509.2000 Full-Depth Deck Repair	6.000 SY		.		.
1010	509.2500 Concrete Masonry Overlay Decks	270.000 CY		.		.
1020	509.9010.S Removing Asphaltic Concrete Deck Overlay (structure) 2001. B-40-400-1D	299.000 SY		.		.

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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
1030	509.9010.S Removing Asphaltic Concrete Deck Overlay (structure) 2003. B-40-400-6C	771.000 SY		.		.
1040	509.9010.S Removing Asphaltic Concrete Deck Overlay (structure) 2004. B-40-400-6D	2,252.000 SY		.		.
1050	513.9005.S Removing and Resetting Tubular Railing (structure) 2003. B-40-400-6C	LUMP	LUMP			.
1060	513.9005.S Removing and Resetting Tubular Railing (structure) 2004. B-40-400-6D	LUMP	LUMP			.
1070	514.0460 Floor Drains Type H	2.000 EACH		.		.
1080	514.0900 Adjusting Floor Drains	4.000 EACH		.		.
1090	514.2608 Downspout 8-Inch **P**	98.000 LF		.		.
1100	514.2625 Downspout 6-Inch	70.000 LF		.		.
1110	516.0500 Rubberized Membrane Waterproofing **P**	278.000 SY		.		.
1120	517.0600 Painting Epoxy System (structure) 2001. B-40-915	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
1130	517.0600 Painting Epoxy System (structure) 2002. B-40-916	LUMP	LUMP			.
1140	517.1010.S Concrete Staining (structure) 2001. R-40-627 **P**	930.000 SF		.		.
1150	517.1010.S Concrete Staining (structure) 2002. R-40-628 **P**	17,478.000 SF		.		.
1160	517.1010.S Concrete Staining (structure) 2003. R-40-629 **P**	13,726.000 SF		.		.
1170	520.8000 Concrete Collars for Pipe	2.000 EACH		.		.
1180	522.1012 Apron Endwalls for Culvert Pipe Reinforced Concrete 12-Inch	3.000 EACH		.		.
1190	522.1015 Apron Endwalls for Culvert Pipe Reinforced Concrete 15-Inch	1.000 EACH		.		.
1200	532.0750.S Temporary Wall Wire Faced Mechanically Stabilized Earth	1,609.000 SF		.		.
1210	550.2146 Piling CIP Concrete 14 X 0.375-Inch	16,055.000 LF		.		.
1220	550.2148 Piling CIP Concrete 14 X 0.50-Inch	1,610.000 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
1230	601.0110 Concrete Curb Type D	87.000 LF		.		.
1240	601.0331 Concrete Curb & Gutter 31-Inch **P**	11,521.000 LF		.		.
1250	601.0409 Concrete Curb & Gutter 30-Inch Type A	2,662.000 LF		.		.
1260	601.0580 Concrete Curb & Gutter 4-Inch Sloped 36-Inch Type R	12.000 LF		.		.
1270	601.0600 Concrete Curb Pedestrian	128.000 LF		.		.
1280	602.0410 Concrete Sidewalk 5-Inch **P**	62,079.000 SF		.		.
1290	602.0420 Concrete Sidewalk 7-Inch **P**	27,857.000 SF		.		.
1300	602.0515 Curb Ramp Detectable Warning Field Natural Patina	830.000 SF		.		.
1310	602.1500 Concrete Steps	53.000 SF		.		.
1320	603.1132 Concrete Barrier Type S32 **P**	302.000 LF		.		.
1330	603.1142 Concrete Barrier Type S42 **P**	222.000 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
1340	603.3111 Concrete Barrier Transition Type NJ32SF to S32	1.000 EACH		.		.
1350	603.8000 Concrete Barrier Temporary Precast Delivered	412.500 LF		.		.
1360	603.8125 Concrete Barrier Temporary Precast Installed	500.000 LF		.		.
1370	604.0400 Slope Paving Concrete	84.000 SY		.		.
1380	606.0200 Riprap Medium	58.000 CY		.		.
1390	607.0406 Storm Sewer Pipe Composite 6-Inch	102.000 LF		.		.
1400	607.0408 Storm Sewer Pipe Composite 8-Inch	323.000 LF		.		.
1410	608.0312 Storm Sewer Pipe Reinforced Concrete Class III 12-Inch	2,235.000 LF		.		.
1420	608.0315 Storm Sewer Pipe Reinforced Concrete Class III 15-Inch	217.000 LF		.		.
1430	608.0318 Storm Sewer Pipe Reinforced Concrete Class III 18-Inch	135.000 LF		.		.
1440	608.0324 Storm Sewer Pipe Reinforced Concrete Class III 24-Inch	1,286.000 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
	608.0330 Storm Sewer					
1450	Pipe Reinforced Concrete Class III 30-Inch	1,286.000 LF		.		.
	608.0336 Storm Sewer					
1460	Pipe Reinforced Concrete Class III 36-Inch	262.000 LF		.		.
	608.0348 Storm Sewer					
1470	Pipe Reinforced Concrete Class III 48-Inch	648.000 LF		.		.
	608.0412 Storm Sewer					
1480	Pipe Reinforced Concrete Class IV 12-Inch	370.000 LF		.		.
	608.0415 Storm Sewer					
1490	Pipe Reinforced Concrete Class IV 15-Inch	16.000 LF		.		.
	608.0424 Storm Sewer					
1500	Pipe Reinforced Concrete Class IV 24-Inch	5.000 LF		.		.
	608.0442 Storm Sewer					
1510	Pipe Reinforced Concrete Class IV 42-Inch	230.000 LF		.		.
	608.0448 Storm Sewer					
1520	Pipe Reinforced Concrete Class IV 48-Inch	431.000 LF		.		.
	608.0512 Storm Sewer					
1530	Pipe Reinforced Concrete Class V 12-Inch	366.000 LF		.		.
	608.0515 Storm Sewer					
1540	Pipe Reinforced Concrete Class V 15-Inch	30.000 LF		.		.
	608.0518 Storm Sewer					
1550	Pipe Reinforced Concrete Class V 18-Inch	73.000 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
1560	611.0420 Reconstructing Manholes	3.000 EACH		.		.
1570	611.0530 Manhole Covers Type J	52.000 EACH		.		.
1580	611.0610 Inlet Covers Type BW	16.000 EACH		.		.
1590	611.0612 Inlet Covers Type C	16.000 EACH		.		.
1600	611.0624 Inlet Covers Type H	2.000 EACH		.		.
1610	611.0660 Inlet Covers Type WM	1.000 EACH		.		.
1620	611.1004 Catch Basins 4-FT Diameter	3.000 EACH		.		.
1630	611.2004 Manholes 4-FT Diameter	23.000 EACH		.		.
1640	611.2005 Manholes 5-FT Diameter	18.000 EACH		.		.
1650	611.2006 Manholes 6-FT Diameter	4.000 EACH		.		.
1660	611.2007 Manholes 7-FT Diameter	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
1670	611.2008 Manholes 8-FT Diameter	1.000 EACH		.		.
1680	611.2604 Manholes Variable Special 4-FT Diameter	6.000 EACH		.		.
1690	611.3004 Inlets 4-FT Diameter	59.000 EACH		.		.
1700	611.3225 Inlets 2x2.5-FT	14.000 EACH		.		.
1710	611.3230 Inlets 2x3-FT	1.000 EACH		.		.
1720	611.8110 Adjusting Manhole Covers	12.000 EACH		.		.
1730	611.8120.S Cover Plates Temporary	50.000 EACH		.		.
1740	612.0104 Pipe Underdrain 4-Inch	708.000 LF		.		.
1750	612.0106 Pipe Underdrain 6-Inch	1,265.000 LF		.		.
1760	612.0206 Pipe Underdrain Unperforated 6-Inch	223.000 LF		.		.
1770	612.0406 Pipe Underdrain Wrapped 6-Inch	2,195.000 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
1780	614.0805 Crash Cushions Permanent Low Maintenance	4.000 EACH		.		.
1790	614.0905 Crash Cushions Temporary	3.000 EACH		.		.
1800	616.0204 Fence Chain Link 4-FT	27.000 LF		.		.
1810	616.0700.S Fence Safety	350.000 LF		.		.
1820	619.1000 Mobilization	1.000 EACH		.		.
1830	620.0300 Concrete Median Sloped Nose **P**	915.000 SF		.		.
1840	624.0100 Water	174.000 MGAL		.		.
1850	625.0105 Topsoil	2,478.000 CY		.		.
1860	627.0200 Mulching	14,871.000 SY		.		.
1870	628.1104 Erosion Bales	600.000 EACH		.		.
1880	628.1504 Silt Fence	670.000 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
1890	628.1520 Silt Fence Maintenance	670.000 LF		.		.
1900	628.1905 Mobilizations Erosion Control	16.000 EACH		.		.
1910	628.1910 Mobilizations Emergency Erosion Control	13.000 EACH		.		.
1920	628.2006 Erosion Mat Urban Class I Type A	7,983.000 SY		.		.
1930	628.7005 Inlet Protection Type A	118.000 EACH		.		.
1940	628.7010 Inlet Protection Type B	192.000 EACH		.		.
1950	628.7015 Inlet Protection Type C	3.000 EACH		.		.
1960	628.7020 Inlet Protection Type D	19.000 EACH		.		.
1970	628.7570 Rock Bags	100.000 EACH		.		.
1980	629.0205 Fertilizer Type A	9.000 CWT		.		.
1990	630.0130 Seeding Mixture No. 30	268.000 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
2000	630.0200 Seeding Temporary	198.000 LB		.		.
2010	631.0300 Sod Water	0.049 MGAL		.		.
2020	631.1000 Sod Lawn	726.000 SY		.		.
2030	632.0101 Trees (species) (size) (root) 0001. BALDCYPRESS, B&B, 2.5" CAL.	4.000 EACH		.		.
2040	632.0101 Trees (species) (size) (root) 0002. COFFEETREE, ESPRESSO KENTUCKY B&B 2.5" CAL.	1.000 EACH		.		.
2050	632.0101 Trees (species) (size) (root) 0003. ELM, FRONTIER, B&B, 2.5" CAL.	1.000 EACH		.		.
2060	632.0101 Trees (species) (size) (root) 0004. HACKBERRY, CHICAGOLAND, B&B, 2.5" CAL.	14.000 EACH		.		.
2070	632.0101 Trees (species) (size) (root) 0005. HONEYLOCUST, SKYLINE, B&B 2.5" CAL.	14.000 EACH		.		.
2080	632.0101 Trees (species) (size) (root) 0006. LINDEN, STERLING SILVER, B&B, 2.5" CAL.	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
2090	632.0101 Trees (species) (size) (root) 0007. MAPLE, GREEN MOUNTAIN SUGAR, B&B, 2.5" CAL.	3.000 EACH		.		.
2100	632.0101 Trees (species) (size) (root) 0008. MAPLE, NORWEGIAN SUNSET SHANTUNG HYBRID, B&B, 2.5" CAL.	1.000 EACH		.		.
2110	632.0101 Trees (species) (size) (root) 0009. MAPLE, SIENNA GLEN, B&B, 2.5" CAL.	14.000 EACH		.		.
2120	632.0101 Trees (species) (size) (root) 0010. OAK, SWAMP WHITE, B&B, 2" CAL.	4.000 EACH		.		.
2130	632.0101 Trees (species) (size) (root) 0011. SPRUCE, BLACK HILLS, B&B, 8' HT.	3.000 EACH		.		.
2140	632.0101 Trees (species) (size) (root) 0012. SPRUCE, BLACK HILLS, B&B, 10' HT.	3.000 EACH		.		.
2150	632.0101 Trees (species) (size) (root) 0013. CRABAPPLE, RED JEWEL, B&B SINGLE STEM, 2" CAL.	17.000 EACH		.		.
2160	632.0101 Trees (species) (size) (root) 0014. HAWTHORN, WINTER KING, B&B CLUMP, 8'-10' HT.	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
2170	632.0101 Trees (species) (size) (root) 0015. LILAC, CHINA SNOW PEKING, B&B CLUMP 8'-10' HT.	14.000 EACH		.		.
2180	632.0101 Trees (species) (size) (root) 0016. QUAKING ASPEN, B&B SINGLE STEM, 2" CAL.	15.000 EACH		.		.
2190	632.0101 Trees (species) (size) (root) 0017. QUAKING ASPEN, B&B CLUMP, 10'-12' HT.	16.000 EACH		.		.
2200	632.0101 Trees (species) (size) (root) 0018. SERVICEBERRY, AUTUMN BRILLIANCE, B&B CLUMP, 10'-12' HT.	2.000 EACH		.		.
2210	632.0201 Shrubs (species) (size) (root) 0001. WITCHHAZEL, COMMON, CG 36" HT.	5.000 EACH		.		.
2220	632.0201 Shrubs (species) (size) (root) 0002. DOGWOOD, BERGESON COMPACT, CG 24" HT	99.000 EACH		.		.
2230	632.0201 Shrubs (species) (size) (root) 0003. FOTHERGILLA, MOUNT AIRY, CG 24" HT	22.000 EACH		.		.
2240	632.0201 Shrubs (species) (size) (root) 0004. HONEYSUCKLE, DWARF BUSH, CG 18" HT	204.000 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
2250	632.0201 Shrubs (species) (size) (root) 0005. HYDRANGEA, LIMELIGHT, CG 30" HT.	9.000 EACH		.		.
2260	632.0201 Shrubs (species) (size) (root) 0006. RUGOSA ROSE, DWARF PAVEMENT CG 18" HT.	225.000 EACH		.		.
2270	632.0201 Shrubs (species) (size) (root) 0007. SUMAC, CUTLEAF (LACELEAF) STAGHORN CG 24" HT.	30.000 EACH		.		.
2280	632.0201 Shrubs (species) (size) (root) 0008. SUMAC, GRO LOW, CG 24" SPREAD	389.000 EACH		.		.
2290	632.0201 Shrubs (species) (size) (root) 0009. VIBURNUM, CHICAGO LUSTRE ARROWWOOD CG 36" HT.	15.000 EACH		.		.
2300	632.0201 Shrubs (species) (size) (root) 0010. VIBURNUM, JUDD, CG 36" HT.	34.000 EACH		.		.
2310	632.9101 Landscape Planting Surveillance and Care Cycles	26.000 EACH		.		.
2320	633.0500 Delineator Reflectors	32.000 EACH		.		.
2330	633.1000 Delineator Brackets	16.000 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
2340	634.0618 Posts Wood 4x6-Inch X 18-FT	37.000 EACH		.		.
2350	634.0816 Posts Tubular Steel 2x2-Inch X 16-FT	34.000 EACH		.		.
2360	637.1220 Signs Type I Reflective SH	1,961.500 SF		.		.
2370	637.2210 Signs Type II Reflective H	1,240.665 SF		.		.
2380	637.2215 Signs Type II Reflective H Folding	85.160 SF		.		.
2390	637.2230 Signs Type II Reflective F	302.630 SF		.		.
2400	638.2101 Moving Signs Type I	3.000 EACH		.		.
2410	638.2102 Moving Signs Type II	16.000 EACH		.		.
2420	638.2601 Removing Signs Type I	9.000 EACH		.		.
2430	638.2602 Removing Signs Type II	76.000 EACH		.		.
2440	638.3000 Removing Small Sign Supports	54.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2450	641.8100 Overhead Sign Support (structure) 0001. S-40-793	LUMP	LUMP			.
2460	641.8100 Overhead Sign Support (structure) 0002. S-40-794	LUMP	LUMP			.
2470	641.8100 Overhead Sign Support (structure) 0003. S-40-795	LUMP	LUMP			.
2480	641.8100 Overhead Sign Support (structure) 0004. S-40-796	LUMP	LUMP			.
2490	641.8100 Overhead Sign Support (structure) 0005. S-40-641	LUMP	LUMP			.
2500	641.8100 Overhead Sign Support (structure) 0006. S-40-642	LUMP	LUMP			.
2510	641.8100 Overhead Sign Support (structure) 0007. S-40-797	LUMP	LUMP			.
2520	642.5401 Field Office Type D	1.000 EACH	.			.
2530	643.0200 Traffic Control Surveillance and Maintenance (project) 0001. 1300-13-74	305.000 DAY	.			.
2540	643.0300 Traffic Control Drums	44,152.000 DAY	.			.
2550	643.0410 Traffic Control Barricades Type II	8,439.000 DAY	.			.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2560	643.0420 Traffic Control Barricades Type III	12,802.000 DAY		.		.
2570	643.0500 Traffic Control Flexible Tubular Marker Posts	10.000 EACH		.		.
2580	643.0600 Traffic Control Flexible Tubular Marker Bases	10.000 EACH		.		.
2590	643.0705 Traffic Control Warning Lights Type A	25,604.000 DAY		.		.
2600	643.0715 Traffic Control Warning Lights Type C	3,682.000 DAY		.		.
2610	643.0800 Traffic Control Arrow Boards	154.000 DAY		.		.
2620	643.0900 Traffic Control Signs	18,008.000 DAY		.		.
2630	643.0910 Traffic Control Covering Signs Type I	10.000 EACH		.		.
2640	643.0920 Traffic Control Covering Signs Type II	8.000 EACH		.		.
2650	643.1000 Traffic Control Signs Fixed Message	186.000 SF		.		.
2660	643.1050 Traffic Control Signs PCMS	45.000 DAY		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2670	643.2000 Traffic Control Detour (project) 0001. 1300-13-74	1.000 EACH		.		.
2680	643.3000 Traffic Control Detour Signs	51,904.000 DAY		.		.
2690	645.0135 Geotextile Fabric Type SR	16,249.000 SY		.		.
2700	646.0106 Pavement Marking Epoxy 4-Inch	12,450.000 LF		.		.
2710	646.0116 Pavement Marking Epoxy 6-Inch	2,864.000 LF		.		.
2720	646.0126 Pavement Marking Epoxy 8-Inch	1,169.000 LF		.		.
2730	646.0600 Removing Pavement Markings	22,039.000 LF		.		.
2740	646.0841.S Pavement Marking Grooved Wet Reflective Contrast Tape 4-Inch **P**	2,535.000 LF		.		.
2750	646.0843.S Pavement Marking Grooved Wet Reflective Contrast Tape 8-Inch **P**	4,936.000 LF		.		.
2760	647.0156 Pavement Marking Arrows Epoxy Type 1	1.000 EACH		.		.

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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
2770	647.0166 Pavement Marking Arrows Epoxy Type 2	15.000 EACH		.		.
2780	647.0176 Pavement Marking Arrows Epoxy Type 3	6.000 EACH		.		.
2790	647.0206 Pavement Marking Arrows Bike Lane Epoxy	12.000 EACH		.		.
2800	647.0253 Pavement Marking Symbols Paint	10.000 EACH		.		.
2810	647.0306 Pavement Marking Symbols Bike Lane Epoxy	16.000 EACH		.		.
2820	647.0356 Pavement Marking Words Epoxy	8.000 EACH		.		.
2830	647.0576 Pavement Marking Stop Line Epoxy 24-Inch	163.000 LF		.		.
2840	647.0606 Pavement Marking Island Nose Epoxy	13.000 EACH		.		.
2850	647.0653 Pavement Marking Parking Stall Paint	12,346.000 LF		.		.
2860	647.0726 Pavement Marking Diagonal Epoxy 12-Inch	682.000 LF		.		.
2870	647.0746 Pavement Marking Diagonal Epoxy 24-Inch	296.000 LF		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2880	647.0776 Pavement Marking Crosswalk Epoxy 12-Inch	308.000 LF		.		.
2890	647.0955 Removing Pavement Markings Arrows	12.000 EACH		.		.
2900	647.0965 Removing Pavement Markings Words	7.000 EACH		.		.
2910	649.0100 Temporary Pavement Marking 4-Inch	2,421.000 LF		.		.
2920	649.0400 Temporary Pavement Marking Removable Tape 4-Inch	4,057.000 LF		.		.
2930	649.0701 Temporary Pavement Marking 8-Inch	687.000 LF		.		.
2940	649.0801 Temporary Pavement Marking Removable Tape 8-Inch	411.000 LF		.		.
2950	649.0900 Temporary Pavement Marking Stop Line 12-Inch	141.000 LF		.		.
2960	649.1000 Temporary Pavement Marking Stop Line Removable Tape 12-Inch	47.000 LF		.		.
2970	649.1500 Temporary Pavement Marking Diagonal 12-Inch	218.000 LF		.		.
2980	649.1700 Temporary Pavement Marking Arrows	6.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
2990	649.1900 Temporary Pavement Marking Words	5.000 EACH		.		.
3000	652.0125 Conduit Rigid Metallic 2-Inch	45.000 LF		.		.
3010	652.0210 Conduit Rigid Nonmetallic Schedule 40 1-Inch	32.000 LF		.		.
3020	652.0225 Conduit Rigid Nonmetallic Schedule 40 2-Inch	7,257.000 LF		.		.
3030	652.0230 Conduit Rigid Nonmetallic Schedule 40 2 1/2-Inch	35.000 LF		.		.
3040	652.0235 Conduit Rigid Nonmetallic Schedule 40 3-Inch	15,571.000 LF		.		.
3050	652.0405 Conduit Reinforced Thermosetting Resin 2-Inch	392.000 LF		.		.
3060	652.0605 Conduit Special 2-Inch	274.000 LF		.		.
3070	652.0615 Conduit Special 3-Inch	175.000 LF		.		.
3080	652.0700.S Install Conduit into Existing Item	1.000 EACH		.		.
3090	652.0800 Conduit Loop Detector	4,529.000 LF		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3100	653.0135 Pull Boxes Steel 24x36-Inch	2.000 EACH		.		.
3110	653.0140 Pull Boxes Steel 24x42-Inch	11.000 EACH		.		.
3120	653.0222 Junction Boxes 18x12x6-Inch	9.000 EACH		.		.
3130	653.0905 Removing Pull Boxes	7.000 EACH		.		.
3140	654.0101 Concrete Bases Type 1	24.000 EACH		.		.
3150	654.0110 Concrete Bases Type 10	6.000 EACH		.		.
3160	654.0113 Concrete Bases Type 13	1.000 EACH		.		.
3170	654.0217 Concrete Control Cabinet Bases Type 9 Special	4.000 EACH		.		.
3180	654.0220 Concrete Control Cabinet Bases Type 10	1.000 EACH		.		.
3190	654.0230 Concrete Control Cabinet Bases Type L30	1.000 EACH		.		.
3200	655.0230 Cable Traffic Signal 5-14 AWG	2,384.000 LF		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
3210	655.0240 Cable Traffic Signal 7-14 AWG	2,959.000	LF	.		.	
3220	655.0260 Cable Traffic Signal 12-14 AWG	5,305.000	LF	.		.	
3230	655.0270 Cable Traffic Signal 15-14 AWG	875.000	LF	.		.	
3240	655.0510 Electrical Wire Traffic Signals 12 AWG	1,800.000	LF	.		.	
3250	655.0515 Electrical Wire Traffic Signals 10 AWG	3,875.000	LF	.		.	
3260	655.0525 Electrical Wire Traffic Signals 6 AWG	150.000	LF	.		.	
3270	655.0610 Electrical Wire Lighting 12 AWG	990.000	LF	.		.	
3280	655.0615 Electrical Wire Lighting 10 AWG	720.000	LF	.		.	
3290	655.0625 Electrical Wire Lighting 6 AWG	2,610.000	LF	.		.	
3300	655.0630 Electrical Wire Lighting 4 AWG	16,820.000	LF	.		.	
3310	655.0700 Loop Detector Lead In Cable	11,726.000	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
3320	655.0800 Loop Detector Wire	13,200.000 LF		.		.
3330	655.0900 Traffic Signal EVP Detector Cable	1,551.000 LF		.		.
3340	656.0200 Electrical Service Meter Breaker Pedestal (location) 0001. HL-40-LK	LUMP	LUMP			.
3350	656.0200 Electrical Service Meter Breaker Pedestal (location) 0002. MB110LW	LUMP	LUMP			.
3360	656.0200 Electrical Service Meter Breaker Pedestal (location) 5001. LINCOLN MEMORIAL DR & IH 794 RAMPS	LUMP	LUMP			.
3370	656.0200 Electrical Service Meter Breaker Pedestal (location) 5002. LINCOLN MEMORIAL DR & CLYBOURN ST	LUMP	LUMP			.
3380	656.0200 Electrical Service Meter Breaker Pedestal (location) 5003. LINCOLN MEMORIAL DR & MICHIGAN ST	LUMP	LUMP			.
3390	656.0200 Electrical Service Meter Breaker Pedestal (location) 5004. CLYBOURN ST & VAN BUREN ST	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
3400	656.0500 Electrical Service Breaker Disconnect Box (location) 0001. CCTV-40-0229	LUMP	LUMP			.
3410	657.0100 Pedestal Bases	15.000 EACH	.			.
3420	657.0255 Transformer Bases Breakaway 11 1/2-Inch Bolt Circle	1.000 EACH	.			.
3430	657.0330 Poles Type 7	5.000 EACH	.			.
3440	657.0405 Traffic Signal Standards Aluminum 3. 5-FT	1.000 EACH	.			.
3450	657.0420 Traffic Signal Standards Aluminum 13-FT	11.000 EACH	.			.
3460	657.0430 Traffic Signal Standards Aluminum 10-FT	3.000 EACH	.			.
3470	657.0725 Luminaire Arms Truss Type 6-Inch Clamp 15-FT	5.000 EACH	.			.
3480	657.6005.S Anchor Assemblies Light Poles on Structures	5.000 EACH	.			.
3490	658.0110 Traffic Signal Face 3-12 Inch Vertical	45.000 EACH	.			.

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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
3500	658.0115 Traffic Signal Face 4-12 Inch Vertical	3.000 EACH		.		.
3510	658.0215 Backplates Signal Face 3 Section 12-Inch	58.000 EACH		.		.
3520	658.0220 Backplates Signal Face 4 Section 12-Inch	7.000 EACH		.		.
3530	658.0412 Pedestrian Signal Face 12-Inch	28.000 EACH		.		.
3540	658.0500 Pedestrian Push Buttons	31.000 EACH		.		.
3550	658.0600 Led Modules 12-Inch Red Ball	36.000 EACH		.		.
3560	658.0605 Led Modules 12-Inch Yellow Ball	31.000 EACH		.		.
3570	658.0610 Led Modules 12-Inch Green Ball	27.000 EACH		.		.
3580	658.0615 Led Modules 12-Inch Red Arrow	12.000 EACH		.		.
3590	658.0620 Led Modules 12-Inch Yellow Arrow	22.000 EACH		.		.
3600	658.0625 Led Modules 12-Inch Green Arrow	19.000 EACH		.		.

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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
3610	658.0660 Led Modules Countdwn Timer 12-Inch	28.000 EACH		.		.
3620	658.1110 Programmable Traffic Signal Face 3-12 Vertical	13.000 EACH		.		.
3630	658.1115 Programmable Traffic Signal Face 4-12 Vertical	4.000 EACH		.		.
3640	658.5069 Signal Mounting Hardware (location) 5001. LINCOLN MEMORIAL DR & IH 794 RAMPS	LUMP	LUMP			.
3650	658.5069 Signal Mounting Hardware (location) 5002. LINCOLN MEMORIAL DR & CLYBOURN ST	LUMP	LUMP			.
3660	659.0802 Plaques Sequence Identification	91.000 EACH		.		.
3670	659.1120 Luminaires Utility LED B	5.000 EACH		.		.
3680	659.1215 Luminaires Underdeck LED C	5.000 EACH		.		.
3690	659.2230 Lighting Control Cabinets 240/480 30-Inch	1.000 EACH		.		.
3700	660.0100 High Mast Foundation (location) 0001. HML-40-026	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
3710	660.0100 High Mast Foundation (location) 0002. HML-40-027	LUMP	LUMP			.
3720	660.0100 High Mast Foundation (location) 0003. HML-40-114	LUMP	LUMP			.
3730	660.0100 High Mast Foundation (location) 0004. HML-40-115	LUMP	LUMP			.
3740	670.0100 Field System Integrator 0001. FTMS	LUMP	LUMP			.
3750	670.0100 Field System Integrator 0002. TRAFFIC SIGNALS	LUMP	LUMP			.
3760	670.0200 ITS Documentation 0001. FTMS	LUMP	LUMP			.
3770	671.0132 Conduit HDPE 3-Duct 2-Inch	245.000 LF	.			.
3780	671.0232 Conduit HDPE Directional Bore 3-Duct 2-Inch	1,280.000 LF	.			.
3790	673.0105 Communication Vault Type 1	4.000 EACH	.			.
3800	674.0300 Remove Cable	240.000 LF	.			.
3810	675.0400.S Install Ethernet Switch	1.000 EACH	.			.

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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
3820	678.0006 Install Fiber Optic Cable Outdoor Plant 6-CT	540.000 LF		.		.
3830	678.0036 Install Fiber Optic Cable Outdoor Plant 36-CT	2,884.000 LF		.		.
3840	678.0072 Install Fiber Optic Cable Outdoor Plant 72-CT	2,115.000 LF		.		.
3850	678.0300 Fiber Optic Splice	172.000 EACH		.		.
3860	678.0400 Fiber Optic Termination	24.000 EACH		.		.
3870	678.0500 Communication System Testing 0001. FTMS	LUMP	LUMP			.
3880	690.0150 Sawing Asphalt	3,192.000 LF		.		.
3890	690.0250 Sawing Concrete	1,677.000 LF		.		.
3900	715.0415 Incentive Strength Concrete Pavement	1,900.000 DOL	1.00000		1900.00	
3910	715.0502 Incentive Strength Concrete Structures	19,490.000 DOL	1.00000		19490.00	

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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
3920	999.1500.S Crack and Damage Survey 0001. U.S. BANK PARKING STRUCTURE 716 E CLYBOURN STREET	LUMP	LUMP			.
3930	999.1500.S Crack and Damage Survey 0002. MILWAUKEE COUNTY TRANSIT CENTER 909 E. MICHIGAN	LUMP	LUMP			.
3940	SPV.0035 Special 1001. BACKFILL FOR PLANT BEDS-24 INCH DEPTH	1,470.000 CY		.		.
3950	SPV.0035 Special 1002. STRUCTURAL SOIL AT STREET TREES	1,306.000 CY		.		.
3960	SPV.0035 Special 1003. DECORATIVE STONE MULCH, 3-INCH	124.000 CY		.		.
3970	SPV.0035 Special 1004. DECOMPOSED GRANITE STONE MULCH, 3-INCH	698.000 CY		.		.
3980	SPV.0035 Special 1005. DRAINAGE BLANKET	1,520.000 CY		.		.
3990	SPV.0035 Special 1006. BEDDING LAYER, 2" ASTM NO. 8 STONE	65.000 CY		.		.
4000	SPV.0035 Special 1007. BASE LAYER, 4" ASTM NO. 57 STONE	135.000 CY		.		.
4010	SPV.0035 Special 1008. STORAGE LAYER, ASTM NO. 2 STONE	1,963.000 CY		.		.

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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
4020	SPV.0035 Special 1009. ENGINEERED SOIL FOR BIO-FILTRATION BASINS	351.000 CY		.		.
4030	SPV.0035 Special 1010. LIGHTWEIGHT FOAMED CONCRETE FILL GRADE 1	1,394.000 CY		.		.
4040	SPV.0035 Special 1011. COLORING CONCRETE DARK GRAY	990.000 CY		.		.
4050	SPV.0035 Special 1012. COLORING CONCRETE LIGHT GRAY	172.000 CY		.		.
4060	SPV.0035 Special 2001. CONCRETE MASONRY OVERLAY DECKS UNIT B-40-400-1D	40.000 CY		.		.
4070	SPV.0035 Special 2002. EXPANDED POLYSTYRENE (EPS) GEOFOAM	3,450.000 CY		.		.
4080	SPV.0035 Special 2003. HPC MASONRY STRUCTURE **P**	1,448.000 CY		.		.
4090	SPV.0060 Special 1001. TRENCH DRAIN	4.000 EACH		.		.
4100	SPV.0060 Special 1002. PERMEABLE PAVEMENT OUTLET CONTROL STRUCTURE	8.000 EACH		.		.
4110	SPV.0060 Special 1003. BIO-FILTRATION OUTLET CONTROL STRUCTURE	4.000 EACH		.		.
4120	SPV.0060 Special 1004. MANHOLE 9-FT DIAMETER	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
4130	SPV.0060 Special 1005. MANHOLE 10-FT DIAMETER	1.000 EACH		.		.
4140	SPV.0060 Special 1006. ENHANCED CATCH BASIN, TYPE 44A STRUCTURE	6.000 EACH		.		.
4150	SPV.0060 Special 1007. ENHANCED CATCH BASIN, TRAPPED STORM STRUCTURE	4.000 EACH		.		.
4160	SPV.0060 Special 1008. STORM CASTING, TYPE MKE	98.000 EACH		.		.
4170	SPV.0060 Special 1009. STORM CASTING, TYPE R-1878-A9L	4.000 EACH		.		.
4180	SPV.0060 Special 1010. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS TYPE 1 **P**	8.000 EACH		.		.
4190	SPV.0060 Special 1011. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS TYPE 2 **P**	19.000 EACH		.		.
4200	SPV.0060 Special 1012. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS TYPE 3 **P**	4.000 EACH		.		.
4210	SPV.0060 Special 1013. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS TYPE 4 **P**	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
4220	SPV.0060 Special 1014. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC ARROWS TYPE 6 **P**	2.000 EACH		.		.
4230	SPV.0060 Special 1015. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC WORDS **P**	17.000 EACH		.		.
4240	SPV.0060 Special 1017. REMOVING DOWNSPOUT, FROM CLEANOUT TO BEND	13.000 EACH		.		.
4250	SPV.0060 Special 1018. DOWNSPOUT CONNECTION, FROM CLEANOUT TO BEND	11.000 EACH		.		.
4260	SPV.0060 Special 1019. DOWNSPOUT OUTFALL ABOVE GRADE	2.000 EACH		.		.
4270	SPV.0060 Special 1020. CATMINT, WALKER'S LOW, CG 1 GAL.	285.000 EACH		.		.
4280	SPV.0060 Special 1021. COREOPSIS, MOONBEAM, CG 1 GAL.	100.000 EACH		.		.
4290	SPV.0060 Special 1022. DAYLILY, STRAWBERRY CANDY, CG 1 GAL.	816.000 EACH		.		.
4300	SPV.0060 Special 1023. GOLDENROD, FIREWORKS, CG 1 GAL.	95.000 EACH		.		.
4310	SPV.0060 Special 1024. NEW ENGLAND ASTER, PURPLE DOME, CG 1 GAL.	106.000 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
4320	SPV.0060 Special 1025. FEATHER REED GRASS, CG 1 GAL.	285.000 EACH		.		.
4330	SPV.0060 Special 1026. INDIANGRASS, CG 1 GAL.	307.000 EACH		.		.
4340	SPV.0060 Special 1027. LITTLE BLUESTEM, CAROUSEL, CG 4" POT	311.000 EACH		.		.
4350	SPV.0060 Special 1028. LITTLE BLUESTEM, THE BLUES, CG 4" POT	300.000 EACH		.		.
4360	SPV.0060 Special 1029. PRAIRIE DROPSEED, TARA DWARF, CG 4" POT	1,101.000 EACH		.		.
4370	SPV.0060 Special 1030. SWITCH GRASS, NORTHWIND, CG 1 GAL.	141.000 EACH		.		.
4380	SPV.0060 Special 1031. SWITCH GRASS, SHENANDOAH, CG 1 GAL.	63.000 EACH		.		.
4390	SPV.0060 Special 1032. ADJUSTING WATER BOXES	5.000 EACH		.		.
4400	SPV.0060 Special 1033. ADJUSTING TES MANHOLE COVERS	1.000 EACH		.		.
4410	SPV.0060 Special 1034. REMOVING TES MANHOLE	1.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4420	SPV.0060 Special 1035. VIBRATING WIRE PIEZOMETER INSTRUMENTATION SYSTEM, DELIVERED	1.000 EACH		.		.
4430	SPV.0060 Special 1036. PRECAST CONCRETE WHEEL STOP	34.000 EACH		.		.
4440	SPV.0060 Special 1037. SIGN SUPPORTS, ALUMINIUM ROUND PIPE, 2 INCH X 9.5 FEET	82.000 EACH		.		.
4450	SPV.0060 Special 1038. SIGN SUPPORTS, SPECIAL MOUNTING	22.000 EACH		.		.
4460	SPV.0060 Special 1039. INTERNAL SANITARY MANHOLE SEAL	10.000 EACH		.		.
4470	SPV.0060 Special 1040. 4-FT DIAMETER SANITARY MANHOLE WITH INTERNAL SEAL	2.000 EACH		.		.
4480	SPV.0060 Special 1041. MASONRY COLUMN 8-FT HT	14.000 EACH		.		.
4490	SPV.0060 Special 1043. SALVAGE CRASH CUSHIONS TEMPORARY	2.000 EACH		.		.
4500	SPV.0060 Special 1044. ENHANCED CATCH BASIN, TYPE 44A MODIFIED STRUCTURE	33.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4510	SPV.0060 Special 1045. 4' DIAMETER "DOGHOUSE" MANHOLE TYPE TES	1.000 EACH		.		.
4520	SPV.0060 Special 1046. 5' DIAMETER "DOGHOUSE" MANHOLE TYPE TES	1.000 EACH		.		.
4530	SPV.0060 Special 1047. 4' DIAMETER MANHOLE TYPE TES	6.000 EACH		.		.
4540	SPV.0060 Special 2001. FLOOR DRAIN SPECIAL	5.000 EACH		.		.
4550	SPV.0060 Special 2002. FLOOR DRAIN GRATE STEEL	4.000 EACH		.		.
4560	SPV.0060 Special 2003. BEARING ELASTOMERIC EXPANSION	30.000 EACH		.		.
4570	SPV.0060 Special 2004. BEARING ELASTOMERIC FIXED	10.000 EACH		.		.
4580	SPV.0060 Special 3001. LAMP DISPOSAL HIGH INTENSITY DISCHARGE	27.000 EACH		.		.
4590	SPV.0060 Special 3002. CABLE SPLICE AT HANDHOLE OR LIGHT POLE PEDESTAL	108.000 EACH		.		.
4600	SPV.0060 Special 3003. REMOVING DISTRIBUTION CENTERS FOR STOCKPILE	1.000 EACH		.		.
4610	SPV.0060 Special 3004. REMOVING UNDERDECK LIGHTING	3.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4620	SPV.0060 Special 3005. REMOVING AND RELOCATING EXISTING HIGH MAST TOWER	4.000 EACH		.		.
4630	SPV.0060 Special 3006. REMOVING CONCRETE FOUNDATION HIGH MAST TOWER	4.000 EACH		.		.
4640	SPV.0060 Special 3007. JUNCTION BOXES 18X12X6-INCH STAINLESS STEEL	14.000 EACH		.		.
4650	SPV.0060 Special 3008. JUNCTION BOXES 6X6X4-INCH STAINLESS STEEL	13.000 EACH		.		.
4660	SPV.0060 Special 3009. JUNCTION BOXES 4X4X2-INCH STAINLESS STEEL	21.000 EACH		.		.
4670	SPV.0060 Special 3010. LUMINAIRES HIGH MAST TOWERS LED	24.000 EACH		.		.
4680	SPV.0060 Special 3011. UNDERDECK LUMINAIRE MOUNTING ASSEMBLY	7.000 EACH		.		.
4690	SPV.0060 Special 3012. TEMPORARY WOOD POLE	3.000 EACH		.		.
4700	SPV.0060 Special 3013. STREET LIGHTING POLYMER CONCRETE VAULT 13-INCH X 24-INCH X 18-INCH	81.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4710	SPV.0060 Special 3014. STREET LIGHTING POLYMER CONCRETE VAULT 17-INCH X 30-INCH X 18-INCH	9.000 EACH		.		.
4720	SPV.0060 Special 3015. PEDESTAL HOUSING 6-INCH X 6-INCH X 36-INCH	59.000 EACH		.		.
4730	SPV.0060 Special 3016. LUMINAIRES CITY OF MILWAUKEE LED STREET LIGHT 180W	49.000 EACH		.		.
4740	SPV.0060 Special 3017. LUMINAIRES CITY OF MILWAUKEE LED STREET LIGHT 105W	25.000 EACH		.		.
4750	SPV.0060 Special 3018. LUMINAIRES CITY OF MILWAUKEE LED STREET LIGHT 40W	15.000 EACH		.		.
4760	SPV.0060 Special 3019. LUMINAIRES CITY OF MILWAUKEE UNDERDECK WALLPACK LED 72W	4.000 EACH		.		.
4770	SPV.0060 Special 3020. LUMINAIRES CITY OF MILWAUKEE UNDERDECK PATH LIGHTING LED 47W	2.000 EACH		.		.
4780	SPV.0060 Special 3021. LIGHT POLE CITY OF MILWAUKEE WHITE SQUARE TAPERED CONCRETE 36FT	40.000 EACH		.		.
4790	SPV.0060 Special 3022. LIGHT POLE CITY OF MILWAUKEE WHITE SQUARE TAPERED CONCRETE 31FT	12.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4800	SPV.0060 Special 3023. LIGHT POLE CITY OF MILWAUKEE WHITE SQUARE TAPERED CONCRETE 26FT	22.000 EACH		.		.
4810	SPV.0060 Special 3024. WHITE SQUARE TAPERED CONCRETE POLE MOUNTING PLATE SET	73.000 EACH		.		.
4820	SPV.0060 Special 3025. DECORATIVE SCONCE LED LUMINAIRE FOR BRIDGE STRUCTURE LIGHTING	24.000 EACH		.		.
4830	SPV.0060 Special 3026. STREET LIGHTING BRACKET ARM 2-INCH DIA. 6-FT, INSTALL ONLY	80.000 EACH		.		.
4840	SPV.0060 Special 3027. STREET LIGHTING BRACKET ADAPTER PLATE 1 1/4-INCH THICK, INSTALL ONLY	7.000 EACH		.		.
4850	SPV.0060 Special 4001. REMOVING MICROWAVE DETECTOR	2.000 EACH		.		.
4860	SPV.0060 Special 4002. REMOVING CONTROLLER CABINET	1.000 EACH		.		.
4870	SPV.0060 Special 4003. REMOVING CONTROLLER CABINET BASE	1.000 EACH		.		.
4880	SPV.0060 Special 4004. REMOVING POLE	2.000 EACH		.		.
4890	SPV.0060 Special 4005. INSTALL CCTV CABINET	1.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
4900	SPV.0060 Special 4006. GROUND ROD	1.000 EACH		.		.
4910	SPV.0060 Special 4007. INSTALL HIGH MAST LIGHT TOWER CCTV CAMERA	1.000 EACH		.		.
4920	SPV.0060 Special 5001. PEDESTAL BASES BLACK	9.000 EACH		.		.
4930	SPV.0060 Special 5002. TRAFFIC SIGNAL STANDARDS ALUMINUM 10-FT BLACK	3.000 EACH		.		.
4940	SPV.0060 Special 5003. TRAFFIC SIGNAL STANDARDS ALUMINUM 13-FT BLACK	3.000 EACH		.		.
4950	SPV.0060 Special 5004. TRAFFIC SIGNAL STANDARDS ALUMINUM 15-FT BLACK	3.000 EACH		.		.
4960	SPV.0060 Special 5005. PULL BOX VAULT 17"X30"X18"	64.000 EACH		.		.
4970	SPV.0060 Special 5006. CONCRETE BASES TYPE 10 SPECIAL	4.000 EACH		.		.
4980	SPV.0060 Special 5007. POLES TYPE 12 SPECIAL	1.000 EACH		.		.
4990	SPV.0060 Special 5008. POLES TYPE 13 SPECIAL	1.000 EACH		.		.
5000	SPV.0060 Special 5009. POLES TYPE 13 SPECIAL BLACK	2.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5010	SPV.0060 Special 5010. MONOTUBE ARMS 40-FT	2.000 EACH		.		.
5020	SPV.0060 Special 5011. MONOTUBE ARMS 40-FT BLACK	2.000 EACH		.		.
5030	SPV.0060 Special 5012. ELECTRICAL RISER	13.000 EACH		.		.
5040	SPV.0060 Special 5013. JUNCTION BOX 12"X12"X6"	2.000 EACH		.		.
5050	SPV.0060 Special 5014. POLES TYPE 9	4.000 EACH		.		.
5060	SPV.0060 Special 5015. POLES TYPE 10	2.000 EACH		.		.
5070	SPV.0060 Special 5016. POLES TYPE 12	1.000 EACH		.		.
5080	SPV.0060 Special 5017. MONOTUBE ARMS 20-FT	3.000 EACH		.		.
5090	SPV.0060 Special 5018. MONOTUBE ARMS 25-FT	2.000 EACH		.		.
5100	SPV.0060 Special 5019. MONOTUBE ARMS 30-FT	1.000 EACH		.		.
5110	SPV.0060 Special 5020. MONOTUBE ARMS 50-FT	1.000 EACH		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5120	SPV.0085 Special 1001. NO-MOW FESCURE SEED MIX	30.000 LB		.		.
5130	SPV.0090 Special 1001. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC STOP LINE 24-INCH	333.000 LF		.		.
5140	SPV.0090 Special 1002. PAVEMENT MARKING GROOVED PREFORMED THERMOPLASTIC CROSSWALK 12-INCH	1,127.000 LF		.		.
5150	SPV.0090 Special 1003. ALUMINUM EDGER	2,213.000 LF		.		.
5160	SPV.0090 Special 1004. PRECAST CONCRETE CURBING	786.000 LF		.		.
5170	SPV.0090 Special 1005. CAST-IN-PLACE CONCRETE SALT LIP CURB	496.000 LF		.		.
5180	SPV.0090 Special 1006. 6-DUCT CONDUIT, CEMENT ENCASED, 4-INCH RIGID NONMETALLIC CONDUIT DB-60	3,230.000 LF		.		.
5190	SPV.0090 Special 1007. 2-DUCT CONDUIT, CEMENT ENCASED, 4-INCH RIGID NONMETALLIC CONDUIT DB-60	51.000 LF		.		.
5200	SPV.0090 Special 1008. 1-DUCT CONDUIT, CEMENT ENCASED, 4-INCH RIGID NONMETALLIC CONDUIT DB-60	498.000 LF		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5210	SPV.0090 Special 1009. STRIP DRAINS	23,571.000 LF		.		.
5220	SPV.0090 Special 1010. PRE-BORED STRIP DRAINS	2,619.000 LF		.		.
5230	SPV.0090 Special 1011. IRRIGATION SLEEVE, 2-INCH	392.000 LF		.		.
5240	SPV.0090 Special 1012. IRRIGATION SLEEVE, 3-INCH	525.000 LF		.		.
5250	SPV.0090 Special 1013. IRRIGATION SLEEVE, 4-INCH	620.000 LF		.		.
5260	SPV.0090 Special 1014. IRRIGATION MAIN LINE, 1. 5-INCH DIA.	302.000 LF		.		.
5270	SPV.0090 Special 1015. IRRIGATION MAIN LINE, 2-INCH DIA.	1,370.000 LF		.		.
5280	SPV.0090 Special 1016. ORNAMENTAL PICKET FENCE 6-FT HT	1,725.000 LF		.		.
5290	SPV.0090 Special 1017. REMOVABLE ORNAMENTAL PICKET FENCE 6-FT HT	539.000 LF		.		.
5300	SPV.0090 Special 1018. DOUBLE SWING GATE WITH 12-FT OPENING	12.000 LF		.		.
5310	SPV.0090 Special 1019. DOUBLE SWING GATE WITH 16-FT OPENING	64.000 LF		.		.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	CTS	BID AMOUNT DOLLARS	CTS
5320	SPV.0090 Special 1020. SLIDING GATE, 24-FT OPENING	96.000	LF	.		.	
5330	SPV.0090 Special 1021. CHAIN LINK FENCE, TEMPORARY 6-FT DELIVERED	3,827.000	LF	.		.	
5340	SPV.0090 Special 1022. CHAIN LINK FENCE, TEMPORARY 6-FT INSTALLED	5,318.000	LF	.		.	
5350	SPV.0090 Special 1023. 10-INCH DIAMETER SANITARY LATERAL	168.000	LF	.		.	
5360	SPV.0090 Special 1024. CONCRETE BARRIER TEMPORARY PRECAST LEFT IN PLACE	225.000	LF	.		.	
5370	SPV.0090 Special 3001. CONDUIT REINFORCED THERMOSETTING RESIN 1-INCH	330.000	LF	.		.	
5380	SPV.0090 Special 3002. TEMPORARY OVERHEAD CABLE QUADRUPLEX 4 AWG	635.000	LF	.		.	
5390	SPV.0090 Special 3003. 3#2/1#8 LTP UNDERGROUND STREET LIGHTING CABLE	4,085.000	LF	.		.	
5400	SPV.0090 Special 3004. 3#4/1#8 LTP UNDERGROUND STREET LIGHTING CABLE	3,770.000	LF	.		.	
5410	SPV.0090 Special 3005. 3#6/1#8 LTP UNDERGROUND STREET LIGHTING CABLE	3,265.000	LF	.		.	

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5420	SPV.0090 Special 3006. 2#12UF WITH GROUND STREET LIGHTING RISER CABLE	450.000 LF		.		.
5430	SPV.0090 Special 3007. 3#12UF WITH GROUND STREET LIGHTING RISER CABLE	60.000 LF		.		.
5440	SPV.0090 Special 5001. TYPE UF CABLE 2 CONDUCTOR NO 14	1,551.000 LF		.		.
5450	SPV.0105 Special 1001. IRRIGATION SERVICE #1	LUMP	LUMP			.
5460	SPV.0105 Special 1002. IRRIGATION SERVICE #2	LUMP	LUMP			.
5470	SPV.0105 Special 1003. SURVEY PROJECT 1300-13-74	LUMP	LUMP			.
5480	SPV.0105 Special 1004. CONCRETE PAVEMENT JOINT LAYOUT	LUMP	LUMP			.
5490	SPV.0105 Special 1005. PAVEMENT CLEANUP PROJECT 1300-13-74	LUMP	LUMP			.
5500	SPV.0105 Special 1006. GEOTECHNICAL INSTRUMENTATION	LUMP	LUMP			.
5510	SPV.0105 Special 2001. RAILING TUBULAR TYPE H MODIFIED B-40-400-1D	LUMP	LUMP			.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5520	SPV.0105 Special 3001. LIGHTING SYSTEM INTEGRATOR	LUMP	LUMP			.
5530	SPV.0105 Special 3002. MAINTENANCE OF LIGHTING SYSTEMS	LUMP	LUMP			.
5540	SPV.0105 Special 5001. TEMPORARY VEHICLE DETECTION SYSTEM LINCOLN MEMORIAL DR & MICHIGAN ST	LUMP	LUMP			.
5550	SPV.0105 Special 5002. INSTALL FIBER OPTIC IN CABINET, LINCOLN MEMORIAL DR & IH 794 RAMPS	LUMP	LUMP			.
5560	SPV.0105 Special 5003. INSTALL FIBER OPTIC IN CABINET, LINCOLN MEMORIAL DR & CLYBOURN ST	LUMP	LUMP			.
5570	SPV.0105 Special 5004. INSTALL FIBER OPTIC IN CABINET, LINCOLN MEMORIAL DR & MICHIGAN ST	LUMP	LUMP			.
5580	SPV.0105 Special 5007. INSTALL TRAFFIC SIGNAL CABINET, LINCOLN MEMORIAL DR & IH 794 RAMPS	LUMP	LUMP			.
5590	SPV.0105 Special 5008. INSTALL TRAFFIC SIGNAL CABINET, LINCOLN MEMORIAL DR & CLYBOURN ST	LUMP	LUMP			.

CONTRACT: 20151110011 PROJECT(S): 1300-13-74 FEDERAL ID(S): N/A

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
5600	SPV.0105 Special 5009. INSTALL TRAFFIC SIGNAL CABINET, LINCOLN MEMORIAL DR & MICHIGAN ST	LUMP	LUMP			.
5610	SPV.0105 Special 5010. INSTALL TRAFFIC SIGNAL CABINET, CLYBOURN ST & VAN BUREN ST	LUMP	LUMP			.
5620	SPV.0105 Special 5011. EVP DETECTOR HEAD INSTALLATION LINCOLN MEMORIAL DR & IH 794 RAMPS	LUMP	LUMP			.
5630	SPV.0105 Special 5012. EVP DETECTOR HEAD INSTALLATION LINCOLN MEMORIAL DR & CLYBOURN ST	LUMP	LUMP			.
5640	SPV.0105 Special 5013. TEMPORARY TRAFFIC SIGNALS, SPECIAL LINCOLN MEMORIAL DR & MICHIGAN ST	LUMP	LUMP			.
5650	SPV.0105 Special 5014. INSTALL S-F MICROWAVE DETECTOR S-40-362	LUMP	LUMP			.
5660	SPV.0105 Special 5015. INSTALL S-F MICROWAVE DETECTOR S-40-850	LUMP	LUMP			.
5670	SPV.0165 Special 1001. SAND-SET CONCRETE PAVER PAVING OVER CONCRETE BASE - 80MM	4,902.000 SF	.			.

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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
5680	SPV.0165 Special 1002. PERMEABLE CONCRETE PAVERS - 80MM, COLOR A	7,503.000 SF		.		.
5690	SPV.0165 Special 1003. PERMEABLE CONCRETE PAVERS - 80MM, COLOR B	4,366.000 SF		.		.
5700	SPV.0165 Special 1004. IRRIGATION ZONES - DRIP	41,760.000 SF		.		.
5710	SPV.0165 Special 1005. IRRIGATION ZONES - SPRAY	5,740.000 SF		.		.
5720	SPV.0165 Special 2001. PRESTRESSED PRECAST CONCRETE WALL PANEL **P**	12,386.000 SF		.		.
5730	SPV.0165 Special 2002. WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP **P**	17,130.000 SF		.		.
5740	SPV.0165 Special 2003. WALL WIRE FACED MECHANICALLY STABILIZED EARTH LRFD/QMP **P**	5,722.000 SF		.		.
5750	SPV.0180 Special 1001. SHREDDED HARDWOOD BARK MULCH	3,672.000 SY		.		.
5760	SPV.0195 Special 1001. MANAGEMENT OF SOLID WASTE	28,553.000 TON		.		.
	SECTION 0001 TOTAL					.
	TOTAL BID					.

PLEASE ATTACH SCHEDULE OF ITEMS HERE