

HIGHWAY WORK PROPOSAL

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

Proposal Number:

12

COUNTY	STATE PROJECT ID	FEDERAL PROJECT ID	PROJECT DESCRIPTION	HIGHWAY
Milwaukee	2195-03-70	WISC 2018 009	West Wells Street, City of Milwaukee Milwaukee River Bridge B-40-544	USH 18

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, \$ 100,000.00 Payable to: Wisconsin Department of Transportation	Attach Proposal Guaranty on back of this PAGE.
Bid Submittal Due Date: December 12, 2017 Time (Local Time): 9:00 AM	Firm Name, Address, City, State, Zip Code
Contract Completion Time November 1, 2018	SAMPLE NOT FOR BIDDING PURPOSES
Assigned Disadvantaged Business Enterprise Goal 12 %	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 Pavement removal, removing old structure over waterway, concrete masonry bridges, concrete curb and gutter, sidewalk, improvements to structural, mechanical, and hydraulic components of the bridge; addition of new railings; placement of concrete slabs at the bridge approaches, milling and placing HMA pavement.	Notice of Award Dated	Date Guaranty Returned
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**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 ExpressTM web site.
 2. Use ExpediteTM software to enter a unit price for every item in the schedule of items.
 3. Submit the bid according to the requirements of ExpediteTM software and the Bid ExpressTM 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 ExpressTM 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 ExpediteTM 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 ExpressTM web site to assure that the schedule of items is prepared properly.

- (2) Staple an 8 1/2 by 11 inch printout of the ExpediteTM 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 ExpediteTM 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 ExpediteTM 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 ExpediteTM generated schedule of items is not the same on each page.
 2. The check code printed on the printout of the ExpediteTM 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

DT1303 1/2006

Wisconsin Department of Transportation

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

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

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

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

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

PRINCIPAL

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

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

NOTARY FOR PRINCIPAL

(Date)

State of Wisconsin)
) ss.
_____ County)

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

(Signature, Notary Public, State of Wisconsin)

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

(Date Commission Expires)

Notary Seal

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

(Signature of Attorney-in-Fact)

NOTARY FOR SURETY

(Date)

State of Wisconsin)
) ss.
_____ County)

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

(Signature, Notary Public, State of Wisconsin)

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

(Date Commission Expires)

Notary Seal

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

CERTIFICATE OF ANNUAL BID BOND

DT1305 8/2003

Wisconsin Department of Transportation

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.

[illegible]

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.

Special Provisions

Table of Contents

Article	Description	Page #
1.	General.....	4
2.	Scope of Work.	4
3.	Prosecution and Progress.	4
4.	Other Contracts.	6
5.	Traffic.	7
6.	Public Convenience and Safety.	7
7.	Holiday Work Restrictions.	7
8.	Environmental Protection, Aquatic Exotic Species Control.....	8
9.	Construction Over or Adjacent to Navigable Waters.	9
10.	Coordination with Businesses and Residents.	9
11.	Utilities.....	9
12.	Notice to Contractor – Survey.	14
13.	Erosion Control.....	14
14.	Notice to Contractor, Verification of Asbestos Inspection, No Asbestos Found.	15
15.	Shop Drawings and Submittals.....	15
16.	Removing Old Structure Over Waterway With Minimal Debris Station 40+36.34, Item 203.0600.S.001.....	18
17.	QMP Base Aggregate.	20
18.	Protection of Concrete.	28
19.	Concrete Identification Stamping.	28
20.	Concrete Masonry Bridges.	28
21.	Expansion Device, B-40-544.....	29
22.	Polymer Overlay, Item 509.5100.S.....	30
23.	Epoxy Injection Crack Repair, Item 509.9025.S; Cored Holes 2-Inch Diameter, Item 509.9026.S.....	36
24.	Structure Repainting General.....	39
25.	Painting Epoxy System B-40-544.....	40
26.	Preparation and Coating of Top Flanges B-40-544, Item 517.0900.S.001.....	41
27.	Concrete Staining B-40-544, Item 517.1010.S.001.....	42
28.	Structure Repainting Recycled Abrasive B-40-544, Item 517.1800.S.001.....	44
29.	Labeling and Disposal of Waste Material.....	47
30.	Structure Overcoating Cleaning and Priming B-40-544, Item 517.3000.S.001.....	50
31.	Negative Pressure Containment and Collection of Waste Materials, B-40-544, Item 517.4500.S.001.....	51
32.	Portable Decontamination Facility, Item 517.6001.S.....	53
33.	Traffic Control.	54
34.	Construction Staking Structure Layout.....	55
35.	Construction Staking Electrical Installations 2195-03-70, Item 650.8500.001.....	55
36.	Lightweight Concrete Masonry, Item SPV.0035.501.....	55
37.	Inlet Screen Type M, Item SPV.0060.001.....	56

38.	Adjusting Water Boxes, Item SPV.0060.003.	58
39.	Utility Line Opening, Item SPV.0060.004.	59
40.	Pedestal Bases Black, Item SPV.0060.201; Traffic Signal Standards Aluminum 3.5-FT Black, Item SPV.0060.202; Traffic Signal Standards Aluminum 13-FT Black, Item SPV.0060.203.....	60
41.	Fiberglass/Polymer Concrete Pull Box 13-Inch x 24-Inch x 24-Inch, Item SPV.0060.301; Fiberglass/Polymer Concrete Pull Box 17-Inch x 30-Inch x 24-Inch, Item SPV.0060.302.	61
42.	Installing City -Furnished Concrete Light Pole Base, Item SPV.0060.303.....	62
43.	Installing Conduit Into Existing Manhole, Item SPV.0060.304.....	63
44.	Adjusting TES Manhole Covers, Item SPV.0060.401.	64
45.	Bearing Maintenance B-40-544, Item SPV.0060.501.	65
46.	Replacing High Strength Bolts, Item SPV.0060.502.....	67
47.	Junction Box 8x8x6-inch, Item SPV.0060.503.	67
48.	Riverwalk Expansion Joint, Item SPV.0060.504; Riverwalk Expansion Joint With Cover Plate, Item SPV.0060.505.	68
49.	Counterweight Ballast, Item SPV.0085.501.....	69
50.	Bridge Structural Steel, Item SPV.0085.502.	70
51.	Construction Staking Concrete Sidewalk, Item SPV.0090.01.....	74
52.	Construction Staking, Upper Layer, Item SPV.0090.02.....	75
53.	Marking Crosswalk Epoxy 12-Inch, Item SPV.0090.003; Marking Crosswalk Epoxy 24-Inch, Item SPV.0090.004; Marking Yield Line Epoxy 36-Inch, Item SPV.0090.005.	76
54.	Marking Line Preformed Plastic 4-Inch, Item SPV.0090.006; Marking Crosswalk Preformed Plastic 12-Inch, Item SPV.0090.007; Marking Line Preformed Plastic 24-Inch, Item SPV.0090.008; Marking Yield Line Preformed Plastic 36-Inch, Item SPV.0090.009.	76
55.	Marine Dock Fender, Item SPV.0090.501.....	77
56.	2 Line Aluminum Railing B-40-544, Item SPV.0090.502.	78
57.	Remove, Repair, Paint, and Reinstall Existing Tubular Railing, Item SPV.0090.503.	79
58.	1-Inch Fiberglass Reinforced Epoxy (FRE) Conduit, Item SPV.0090.504.....	81
59.	Rectangular Rapid Flashing Beacon System, Item SPV.0105.201.	82
60.	Bridge Machinery – General.....	85
61.	Bumper Beams, Item SPV.0105.501.	101
62.	Counterweight Machinery, Item SPV.0105.502.....	105
63.	Equalizer Machinery, Item SPV.0105.503.	107
64.	Span Guides, Item SPV.0105.504.....	111
65.	Bridge Electrical Work, Item SPV.0105.505.....	113
66.	Packaged Engine Generator, Item SPV.0105.506; and Generator Mechanical Work, Item SPV.0105.507.....	156
67.	Bridge Hydraulic System, Item SPV.0105.508.	172
68.	Field Verification Survey, Item SPV.0105.509.....	201
69.	Counterweight Balancing Calculations, Item SPV.0105.510.....	203
70.	Temporary Lift Span Shoring, Item SPV.0105.511.	204
71.	Lift Span Roadway Joints, Item SPV.0105.512.	206

72.	Lift Span Sidewalk Joints, Item SPV.0105.513.....	206
73.	Refurbishing Existing Name Plates, Item SPV.0105.514.....	207
74.	Name Plate, Item SPV.0105.515.	208
75.	Fiberglass Sidewalk Floor Plates, Item SPV.0165.501.	209
76.	Metal Plates for Bike Lanes, Item SPV.0165.502.	212
77.	Joint Sealing, Item SPV.0180.01.	213

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 2195-03-70, West Wells Street, Milwaukee River Bridge B-40-544 and Approaches, USH 18, located in the City of Milwaukee, 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, 2018 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 (20170615)

2. Scope of Work.

The work under this contract shall consist of rehabilitating Structure B-40-544, including structural, hydraulic, mechanical and electrical upgrades, construction of reinforced concrete approach slabs 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 meeting. 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.

During construction of the bridge, close West Wells Street to traffic as shown on the traffic control plans for the entire construction period. Refer to traffic control plans for eastbound and westbound traffic detour routing.

WE Energies Steam will be removing the pavement surface over their steam tunnel facility to make adjustments. Contractor to coordinate removal timing and limits for this work with WE Energies contractor. The removal must occur immediately prior to the bridge expansion joint work. The Wells Bridge expansion joints must be completed prior to the pavement surface over the steam tunnel being replaced. WE Energies' contractor will be responsible for constructing this pavement. Coordinate with WE Energies contractor to complete the paving work, and not impact construction schedule. See Utilities article for more information.

Northern Long-eared Bat (*Myotis septentrionalis*)

Northern Long-eared Bats (NLEB) have the potential to inhabit the project limits because they roost in trees. Roosts may not have been observed on this project, but conditions to support the species exist. The species and all active roosts are protected by the Federal Endangered Species Act. If an individual bat or active roost is encountered during construction operations, stop work and notify the engineer and the WisDOT Regional Environmental Coordinator (REC).

If additional construction activities beyond what was originally specified are required to complete the work, approval from the engineer, following coordination with WisDOT REC, is required prior to initiating these activities.

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 Over Waterway with Minimal Debris.

Birds (20090901)

Coast Guard

Notify the following personnel within the specified time period prior to commencing any construction operations:

- Obtain permission from the engineer a minimum of 48 hours prior to any construction schedule change.

- The Coast Guard has determined that the project will not require a Coast Guard permit as there are no changes that alter the permitted navigational clearances or character of the bridge; however it does require a letter of authorization to proceed. Once the contract is awarded, the contractor is required to coordinate efforts with the U.S. Coast Guard – Commander, Ninth coast Guard District, 1240 East 9th Street, Room 2019, Cleveland, OH 44199-2060, telephone (216) 904-6085, fax (216) 902-6088 at least 30 days in advance of any construction over the waterway. Allow an additional five days for mail processing once the package has been received by the U.S. Coast Guard facility. Primary contacts are:

<u>Name:</u>	<u>Phone:</u>	<u>Email:</u>
Lee Soule	(216) 902-6085	lee.d.soule@uscg.mil
Scot Striffler	(216) 902-6087	scot.m.striffler@uscg.mil
Blair Stanifer	(216)902-6086	William.B.Stanifer@uscg.mil

Provide the Coast Guard with a schedule and timeframe for repairs to the lift span and describe any temporary construction aids and work within the limits of the Milwaukee River to receive the U.S. Coast Guard authorization. The Coast Guard notification requirement is based on anticipated beginning of construction on the lift span and any work that affects the operation of the bridge or navigation within the Milwaukee River throughout the duration of the project.

During the project (due to unforeseen project requirements) if the contractor needs to alter the original plan as it affects the navigation of the waterway the contractor must provide a minimum of two weeks advance notice to the Coast Guard prior to altering the original plan. Copy the engineer on all correspondence with the Coast Guard.

The contractor must maintain a clearance of at least 25’-6” above the City of Milwaukee Datum under the lift span at all times for the navigational traffic. The barges, if needed for construction, must be positioned outside the navigational waterway unless the minimum two weeks’ prior notice is given to the Coast Guard.

The scaffolding or containment shall not be installed more than 2’-0” under the steel girders on the approach fixed spans. The contractor must provide temporary lighting (steady burning amber lights on the bottom and four corners during non-working hours) to denote the low clearance of the scaffolding or containment on the approach fixed spans and the lift span.

4. Other Contracts.

WISDOT Project: 2200-14-70

The City of Milwaukee in conjunction with the Wisconsin Department of Transportation is resurfacing East/West Wells Street from North 6th Street to North Broadway. Construction is anticipated to take place from early May 2017 to early November 2017. Coordinate detour and traffic control operations with the adjacent resurfacing project. Contact paving contractor to coordinate operations.

5. Traffic.

On-street parking will not be allowed on West Wells Street within the project limits during construction.

The City of Milwaukee will provide all posting of parking restrictions to facilitate construction operations. Contact Sharon Betthauser of Traffic and lighting at (414) 286-3632 three working days prior to the start of construction operations.

Provide access for mail service, utility meter reading and garbage pick-up.

Access to all properties within the project limits is required for emergency vehicles and equipment which provide fire, police and rescue service to the public. In the event such service is required, cooperate to the fullest extent in accommodating emergency access in the shortest time possible.

Do not store equipment, vehicles or materials beyond the project limits without specific approval by the engineer.

6. Public Convenience and Safety.

Revise standard spec 107.8(6) as follows:

Check for and comply with local ordinances governing the hours of operation of construction equipment. Do not operate motorized construction equipment from 9:00 PM until the following 7:00 AM, unless prior written approval is obtained from the engineer.
stp-107-001 (20060512)

7. Holiday Work Restrictions.

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

- From noon Friday, May 25, 2018 to 6:00 AM Tuesday, May 29, 2018 for Memorial Day;
- From noon Tuesday, July 3, 2018 to 6:00 AM Thursday, July 5, 2018 for Independence Day;
- From noon Friday, August 31, 2018 to 6:00 AM Tuesday, September 4, 2018 for Labor Day.

stp-107-005 (20050502)

8. 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 ~212° 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 (>104° F) application.

Complete the inspection and removal procedure before equipment is brought to the project site and before the equipment leaves the project site.

stp-107-055 (20130615)

9. Construction Over or Adjacent to Navigable Waters.

Add the following to standard spec 107.19:

The Milwaukee River is classified as a navigable waterway.
stp-107-060 (20150630)

10. Coordination with Businesses and Residents.

The contractor shall 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 no further meetings will be required unless directed by the engineer. The contractor shall 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.
stp-108-060 (20141107)

Contact Cecelia Gilbert the City of Milwaukee's Support for Business Liaison contact at (414) 286-3318 for coordination purposes and for support in reaching out to local businesses.

11. Utilities.

This contract does not come under the provision of Administrative Rule Trans 220.
stp-107-065 (20080501)

The City of Milwaukee has notified the department that the following operations necessary for the construction of new facilities and/or adjustment of existing facilities will be coordinated with the contractor's construction operations by each representative utility unless otherwise noted. 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 statutes. Use caution to ensure the integrity of underground facilities and maintain code clearances from overhead facilities at all times.

The project contains numerous utility manholes located within the construction area. The utility companies have been advised of the requirement to coordinate adjusting their manhole covers in conjunction with the contractor's operations. Provide a minimum of 10 days' advance notice to each manhole owner before commencing construction operations over affected manholes. In addition, provide 10 days' advance notice so utilities may set their covers to match final pavement elevations.

Note: Bidders are advised to contact each utility company listed in the plans prior to preparing their bid to obtain current information on the status of each utility company's work required in association with the project. Existing trees, street light poles, hydrants and utility

poles are to remain in place during construction unless noted on plans. Conduct an on-site visit prior to bidding to determine any special measures required for proper clearance between the trees, hydrants, poles, other utilities and any other physical structures and the construction equipment. During construction operations, keep all manholes accessible to utility companies for emergencies.

A. AT&T Local (TCA)

AT&T Local has underground facilities in a WE Energies duct as shown on the utility plans. No impacts are anticipated at this time. No work is planned on their facilities.

Contact Jennifer Navarro at (414) 459-3564 with any concerns or questions.

B. AT&T Wisconsin

AT&T has facilities outside the project limits. No impacts are anticipated, and no work is planned on their facilities. Contact Mr. Jay Bulanek at (262) 896-7669 with any concerns or questions.

C. Charter Communications

Charter Communications has underground facilities within the project limits. One underground facility crosses near Station 39+18, and the others are located in the City of Milwaukee's CUC which is located approximately 20 feet north of the southerly right-of-way line within the project limits.

No impacts are anticipated at this time. No work is planned on their facilities. Contact Mr. Steve Cramer at (414) 277-4045 for concerns or questions.

D. City of Milwaukee

D.1 City Underground Conduit (CUC)

There is an 8-duct City Underground Conduit (CUC) package in West Wells Street that crosses below the Milwaukee River that will remain in place and is not in conflict with this project.

There are CUC vaults in the bridge approaches on each side of the river with two manhole covers per vault. These manhole covers are to be adjusted by the contractor and included in the contract.

There are three pipes from the west CUC vault that leads to the bridge house. The 2" pipe and 2 1/2" pipe that are poured into the bridge deck will be removed and replaced at the location of the bridge expansion joint by the contractor. The 2 1/2" pipe suspended below the bridge shall be protected by the contractor and is not in conflict with the project.

All cables currently occupying the pipes in conflict with the expansion joint replacement shall be removed by city forces and pulled back out of the pipes prior to the start of construction.

If any questions or concerns arise during construction, contact Communications Dispatch at (414) 286-3686.

D.2 Communications

The City of Milwaukee has communications fiber and copper cables in underground conduit located on the east and west side of the Wells Street Bridge. All cables currently occupying the pipes in conflict with the expansion joint replacement shall be removed by city forces and pulled back out of the pipes prior to the start of construction. Once construction is complete, city forces will re-install cable into bridge. No other conflicts are anticipated.

If any questions or concerns arise during construction, contact Communications Dispatch at (414) 286-3686.

D.3 Sewers

The City of Milwaukee does not have sewer facilities or conflicts within the limits of the project.

If any questions or concerns arise during construction, contact Mr. Zafar Yousuf of the City of Milwaukee at (414) 286-2467.

D.4 Street Lighting

The City of Milwaukee has street lighting facilities within the limits of the project. Existing street lighting facilities closest to the structure will be removed before construction starts. Temporary overhead circuitry will be installed east of the bridge over the roadway to keep the remaining street lights working. This project will have some areas in which temporary overhead will be installed. Throughout this project, street lighting facilities will be protected and adjusted by City of Milwaukee Street Lighting personnel before and during construction, as needed. The contractor will anchor street lighting conduit to the bridge as part of the project.

City of Milwaukee street lighting personnel will install temporary overhead facilities and relocate permanent facilities, in the areas determined by street lighting engineering before construction starts. After construction street lighting forces will install permanent lighting facilities.

The engineer and/or contractor shall keep the street lighting construction supervisors informed of the status of construction. Contact Dennis Miller at (414) 286-5942 office, (414) 708-4251 cell; or George Berdine at (414) 286-5943 office, (414) 708-4245 cell. If neither are available, then contact dispatcher at (414) 286-5944.

Keep the area behind the curb free from over-pour and other debris.

If the contractor requests the relocation of any street lighting facilities, permanent or temporary for their convenience, they will be responsible for all costs incurred by street lighting personnel fulfilling the request.

Contact Mr. Denis Kozelek of the City of Milwaukee at (414) 286-3252 with only design/engineering concerns or questions. If you have questions or concerns about field work or work scheduling please contact the street lighting construction supervisors noted above.

Provide as-built plans of the street lighting facilities to:

City of Milwaukee
Infrastructure Services Division
Transportation Section
Street Lighting Engineering Manager
841 N. Broadway, Room 920
Milwaukee, WI. 53202

D.5 Traffic Signals

There is an electronic dynamic guide sign at Station 39+25.5; 38.0' RT which receives power from the traffic signal west of the project. Prior to construction, the City of Milwaukee will de-energize the line and remove the sign to be stored offsite throughout construction. City forces will install a protection cover over the base for the construction duration. There is a traffic sign mast arm and pole located at approximately 39+29; 28.0' RT. Prior to construction, the City of Milwaukee will permanently remove this structure.

Rectangular rapid flashing beacons (RRFB) will be installed as part of the project. The power supply to the RRFB will be from connections at the bridge operator's house. The contractor is responsible to coordinate with the bridge electrical contractor to make all necessary connections and pull all required wire to connect to the bridge power source. See Article 58, Rectangular Rapid Flashing Beacon System, Item SPV.0105.201 for more information.

Provide a 10-working day advance notice to Mr. Al Nichols of the City of Milwaukee's Traffic Signal Field Operations at (414) 286-5941 office or (414) 708-5148 mobile, to oversee the installation of the RRFB. The installation of the RRFB is to be completed by the contractor as shown in the contract documents.

Coordinate all Traffic Signal Operation with Mr. Scott Reinbacher of the City of Milwaukee's Traffic Engineering at (414) 286-3232 as well as any city traffic signal concerns.

D.6. Water Works

The Milwaukee Water Works has facilities outside the project limits. No impacts are anticipated, and no work is planned on their facilities. Contact Mr. Dave Goldapp at (414) 286-6301 with any concerns or questions.

E. Milwaukee Metropolitan Sewerage District (MMSD)

MMSD has two stop plank structures within the project limits. Their locations are located at Station 39+25 and Station 41+27.8. MMSD will reconstruct the upper 2 feet of both

structures which will include new concrete deck in coordination with construction operations. The contractor will construct the final riding surface over the structure per the plans. MMSD anticipates their work will take 20 working days.

Contact Larry Anderson at (414) 225-2214 with any concerns or questions.

F. Verizon Business

Verizon has underground facilities in City of Milwaukee CUC which is located approximately 20 feet north of the southerly right-of-way line within the project limits. No impacts are anticipated at this time. No work is planned on their facilities.

Contact Mr. Thomas Buher at (708) 458-6410 with any concerns or questions.

G. WE Energies – Electric

WE Energies - Electric has underground facilities within the limits of the project as shown on utility plans. WE Energies will install an upgraded 480V 400A service into their existing conduit to the bridge house during construction. WE Energies anticipates this work will take 10 working days. The WE electric line suspended below the southwest corner of the bridge shall be protected by the contractor and is not in conflict with the project.

It is imperative that the highway contractor contact We Energies before removing any gas facilities or electrical underground cables, to verify that they have been discontinued and carry no natural gas or electrical current. The contractor must not assume that unmarked facilities have been discontinued. 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, 1 (800) 662-4797

We Energies Gas Dispatch, 1 (800) 261-5325

Provide a 6 week notice to Mr. Josh Mount at (414) 218-2053 or Mr. Dan Sande at (414) 221-5617 to coordinate work during construction.

H. WE Energies - Gas

WE Energies – Gas has facilities within the limits of the project. Gas valves will be adjusted by WE Energies staff during construction in coordination with the paving contractor at the following location: Station 39+25, 30 ft right. The WE Gas main suspended below the southwest corner of the bridge shall be protected by the contractor and is not in conflict with the project.

It is imperative that the highway contractor contact We Energies before removing any gas facilities or electrical underground cables, to verify that they have been discontinued and carry no natural gas or electrical current. The contractor must not assume that unmarked facilities have been discontinued. 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, 1 (800) 662-4797
We Energies Gas Dispatch, 1 (800) 261-5325

Provide a 14 day notice, and 3 day reminder notice to Mr. Paul Hebein at (414) 688-7257 to coordinate work during construction. WE Energies gas anticipates their work will take 1-3 working days. Contact Mr. Dan Sande at (414) 221-5617 with any questions or concerns.

I. WE Energies - Steam

WE Energies - Steam has underground facilities within the limits of the project on the east bridge approach as shown in the utility plans. Prior to construction, WE Energies forces will remove pavement to the top of steam facility manhole roof. WE Energies forces will install new manhole access doors and waterproofing. During construction, WE Energies forces will install new concrete sidewalk and road surface above the manhole roof structure to proposed grade. The proposed grades have been provided by the City of Milwaukee to WE Energies and are in the plans. Project inspector will approve final riding surfaces constructed by WE Energies. Contractor is not responsible for WE Energies contractor's work. If the roof structure of their manhole requires reconstruction, WE Energies will complete the work. See Article 3, Prosecution and Progress for more information.

Provide a 3 week notice prior to the removals and steam facility adjustment work, and another 3 week notice prior to the proposed installation of pavement above WE Energies structure to Mr. Paul Sartorelli at (414) 221-2375 to coordinate work during construction. WE Energies anticipates this work will take 21 working days.

12. Notice to Contractor – Survey.

Digital design file information/existing surface data, including design surface DTMs and/or coordinate system GPS information will not be available for this project.

All survey work necessary to stake out and construct all portions of this project will be measured and paid for under the staking bid items designated in this contract.

13. Erosion Control.

Perform this work according to the requirements of standard spec 107.20 and as hereinafter supplemented.

Take adequate precautions to install and maintain necessary erosion and sediment control during grading and construction operations at curbs and gutters, and at other locations determined by the engineer. Protect storm drain inlets, manholes, and MMSD stop plank structures, as determined by the engineer, with a filter fabric meeting accepted design criteria, standards, and specifications. Maintain all erosion control measures until such time that the engineer determines the measures are no longer necessary. Protecting storm drain inlets, manholes and MMSD stop plank structures will be paid under bid item SPV.0060.001, Inlet Screen Type M.

Submit the Erosion Control Implementation Plan (ECIP) a minimum of 14 days prior to the preconstruction meeting for approval by the department and concurrence by the Wisconsin Department of Natural Resources (DNR). Contractor will not be allowed to start until written approval has been received from the department.

14. Notice to Contractor, Verification of Asbestos Inspection, No Asbestos Found.

John Roelke, License Number All-119523, inspected Structure B-40-0544 for asbestos on March 20, 2014. No regulated Asbestos Containing Material (RACM) was found on this structure. A copy of the inspection report is available from: Jonathan Thomas at (414) 286-0463.
stp-107-127 (20120615)

15. Shop Drawings and Submittals.

A Description

This special provision describes specific requirements for shop drawings and other submittals.

B Materials

B.1 General

Submit construction drawings, erection diagrams, shop details, catalog data, test data, and other pertinent information for review as specified herein, and as specified in other special provisions.

Review by the engineer of shop drawings, methods of installation or contractor's construction details does not relieve the contractor of the responsibility of compliance with the contract specifications; and does not relieve the contractor of the responsibility for providing adequate quality control measures; and does not relieve the contractor of the responsibility for providing proper and sufficient materials, equipment and labor to complete the approved work according to the contract documents.

Unless otherwise stated in the contract documents, do not commence any portion of the work requiring shop drawings or a sample of the work until the submission has been approved by the engineer.

Unless otherwise stated in the contract documents, review of shop drawings, erection plans, and demolition plans will begin only after the submission of a complete set of information required to complete a discrete item of work.

Each individual piece of equipment furnished for a particular item must be compatible with all the other equipment associated with the item. It is the responsibility of the contractor to make certain that all items furnished for the project are compatible and will perform the function indicated on the plans and within the specifications. Some of the mechanical and hydraulic equipment is specified by catalog number in order to establish the minimum

requirements and special features needed for the project. Compatibility with other specified equipment is not guaranteed. It is the contractor's responsibility to verify the compatibility of all equipment before submitting it for review. The engineer will review the submissions for compliance with the requirements of the special provisions, but not for compatibility.

B.2 Submittal Materials

Submit all data on paper measuring either 8-1/2-inch x 11-inch, 11-inch x 17-inch, or 24-inch x 36-inch as is appropriate. Where appropriate, bind individual sheets measuring 8- 1/2-inch x 11-inch into sets with a cover, title sheet, and table of contents.

Submit to the engineer samples of materials for selection of colors, patterns, finishes, etc. for all items which affect the appearance of the bridge and the inside and outside of the bridge houses and other product samples when required by the various articles of the special provisions or the standard specifications. Product samples become the property of the City of Milwaukee unless determined otherwise by the engineer.

B.3 Submitting and Review Process

The review process will consist of two or more steps. The first step is to submit four copies of sets of materials to the engineer, or his designated agent, for preliminary review. The engineer, or his designated agent, will return one copy or set of submitted materials with instruction for correction and re-submittal. When instructed by the engineer, resubmit four copies or sets of materials for further review. When instructed by the engineer, the final step is to submit materials to the engineer, or his designated agent for distribution. The engineer will return one to three copies or sets of materials to the contractor with a stamp denoting general conformance to the plans and specifications. The exact review process, number of copies or sets of submittal materials, delivery requirements, and other procedural matters for the complex project will be determined at the pre-construction conference.

Drawings that are not initialed as having been checked or obviously have not been completed or are not clear and legible will not be accepted for review. The contractor will be notified that the subject drawings must be properly completed and resubmitted for review.

The title box of each shop drawing must carry the job number and structure and control section numbers, and the name and address of the fabricator, foundry, or manufacturer. The title sheet of each bound set of product information sheets must carry the job, control, and structure identification numbers, and the name and address of the supplier. Each sheet in a bound set must clearly identify the product or products being used and carry the name of the manufacturer.

A unique drawing and/or sheet number must be placed on each sheet so that similar items with subtle differences will not be confused with one another. When data is returned by the engineer to the contractor for correction and re-submission, each revised sheet needs to be marked with a revision number, indicating the number of times the sheet has been revised since the first submission and with the date of each revision. Each change on the sheet must also be marked with the appropriate revision number, shown on a small triangle, placed next to the change.

Drawings on data sheets that contain information for items or options other than those intended for use on this project must be clearly marked so as to indicate which items or options are intended for use on this project. Line or cross out those items or options that do not apply, or by circling or highlighting those items or options that do apply. Whatever method is used it must be done in a manner that clearly indicated which items apply to the project.

The contractor is responsible to make sure that everyone, including suppliers, furnishes complete product and shop detail data for review by the engineer. The data must include, but is not limited to, the following:

1. Drawings including information on the exact number of units, exact unit to be furnished, and all of the equipment options to be furnished with the unit. Dimensions, material grades fits, finishes applicable standards (ASTM, AASHTO, ANSI, and other applicable standards) and all other data sufficient to meet the requirements of the contract documents.
2. Complete catalog data and specifications including the name of the manufacturer.
3. Complete installation and maintenance instructions.
4. Drawings and catalog data must indicate the pertinent bid item.

If a submission is incomplete, it may be returned without review or comment. If so, it must be completed before re-submittal. The contractor is advised to keep an accurate record of all shop drawing transmittals and to maintain constant contact with all suppliers to obtain prompt re-submittal of drawings and data returned for correction and completion. Significant time lapses between the return and re-submittals of data could delay the project and shall be avoided.

B.4 Submittal and Review Time

It is the contractor's responsibility to ensure that all shop details and data are submitted for approval in a timely manner. The preparation of construction drawings, shop details compilation of the technical data, transmittals, review, revision, and re-submittals constitutes a time consuming process.

Span balance calculations, balance testing, acceptance testing of in situ equipment or portions of the structure, and other submittals required during construction or operation of the bridge shall be submitted in a timely manner and according to the various articles of the special provisions.

Although no specific time periods are established herein for submittals or for the engineers review, the contractor should anticipate that each review may take up to approximately 21 days. The engineer, or his designated agent, will endeavor to complete each review in the shortest practical time. However the contractor must realize that this is a complex project

with many inter-related parts and that instant reviews are generally not practical. Delays in submitting, reviewing, or approving submittals will not be cause for additional compensation.

B.5 Operating and Maintenance Manuals

Submit operation and maintenance manuals required by the contract documents for preliminary review and approval according to Bridge Machinery – General, Bridge Hydraulic System, and Bridge Electrical Work of these special provisions. The number of distribution copies is five hard copies and two electronic copies, unless otherwise required on the plans or in other special provisions.

B.6 As-Built Drawings

Furnish final shop drawings in electronic format and hard copy. Also furnish a copy of all catalogue cuts, parts lists, operating procedures, operating and maintenance manuals, and other data required by the articles of the special provisions clearly marked that these items of work are included in the final work. The words “As-Built” and the date are acceptable for this identification.

C (Vacant)

D (Vacant)

E Payment

The department will not pay for any costs associated with shop drawings or other submittals. Include all costs for preparation, handling, shipping, storage, or other expenses associated with shop drawings, erection drawings, catalog data, test data, calculations, operating manuals, parts lists, maintenance manuals, and “As-Built Drawings” in the costs of the bid items with which the submittals are associated.

The department reserves the right to charge reasonable expenses for the review of submittals where the contractor substitutes items, at his option, for items previously submitted and approved for use in the project. Re-submittals requested by the department will not be back chargeable, except in the cases where the contractor obviously has not addressed previous review comments.

16. Removing Old Structure Over Waterway With Minimal Debris Station 40+36.34, Item 203.0600.S.001.

Conform to standard spec 203 as modified in this special provision.

Add the following to standard spec 203:

203.3.6 Removals Over Waterways and Wetlands

203.3.6.2 Removing Old Structure Over Waterway with Minimal Debris

- (1) Remove the existing Structure B-40-544 over the Milwaukee River in large sections and conforming to the contractor’s approved structure removal and clean-up plan. During

superstructure removal, prevent all large pieces and minimize the number of small pieces from entering the waterway or wetland. Remove all reinforcing steel, all concrete, and all other debris that falls into the waterway or wetland. The contractor may leave limited amounts of small concrete pieces scattered over the waterway floor or wetland only if the engineer allows.

- (2) Submit a structure removal and clean-up plan as part of the erosion control implementation plan required under standard spec 107.20. Do not start work under the structure removal and clean-up plan without the department's written approval of the plan. Include the following information in the structure removal and clean-up plan:
 1. Methods and schedule to remove the structure.
 2. Methods to control potentially harmful environmental impacts.
 3. Methods for superstructure removal that prevent all large pieces and minimize the number of small pieces from entering the waterway or wetlands.
 4. Methods to control dust and contain slurry.
 5. Methods for removing piers and abutments. If blasting in water, include restrictions that regulatory agencies and the contract require.
 6. Methods for cleaning the waterway or wetlands.
- (3) If stockpiling spoil material, place it on an upland site an adequate distance from the waterway, wetland, or any open water created by excavation. Install silt fence between the spoil pile and the waterway, wetland, or excavation site.

Remove portions of the existing bridge as shown on the plans. Items to be removed include but are not limited to the following:

1. Concrete Sidewalks on the West and East Approach Spans.
2. Existing Lift Span Roadway and Sidewalk Joints.
3. Existing end of concrete approach spans for joint replacement.
4. Existing expansion joints at riverwalks.
5. Reinforced concrete knee-wall on Pier 1 near the bridge house.
6. Existing steel sections that are to be removed, replaced, or repaired.
7. Existing asphalt fill and the supporting steel plate and connections.
8. Existing sidewalk plates.
9. Existing conduit that are cast into the sidewalks or bridge decks at removal areas in the approach spans.

Additional items to be removed and paid for under separate work items include but are not limited to the following:

1. Operating Machinery
2. Traffic signals, gates, etc.
3. Concrete repairs
4. Existing railings on the deck and in the piers
5. Timber walers

Add the following Removing Old Structure bid item to standard spec 203.5.1:

ITEM NUMBER	DESCRIPTION	UNIT
203.0600.S.001	Removing Old Structure Over Waterway With Minimal Debris Station 40+36.34	LS

stp-203-020 (20080902)

17. 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 and paid for under the Aggregate Detours, 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://wisconsin.gov/Pages/doing-bus/eng-consultants/cnslt-rsrcs/rdwy/default.aspx>

A.2 Small Quantities

- (1) The department defines a small quantity, for each individual Base Aggregate bid item, as a contract 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:

A.2.1 Quality Control Plan

- (1) Submit an abbreviated quality control plan consisting of the following:
 1. Organizational chart including names, telephone numbers, current certification(s) with HTCP number(s) and expiration date(s), and roles and responsibilities of all persons involved in the quality control program for material under affected bid items.

A.2.2 Contractor Testing

1.

Contract Quantity	Minimum Required Testing per source
≤ 6000 tons	One stockpile test prior to placement, and two production or one loadout test. ^{[1] [2]}
> 6000 tons and ≤ 9000 tons	One stockpile and Three placement tests ^[3] [4] [5]

- ^[1] Submit production 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] If the actual quantity overruns 6,000 tons, on the next day of placement perform one randomly selected placement test for each 3000 tons, or fraction of 3000 tons, of overrun.
 - ^[3] If the actual quantity overruns 9000 tons, on the next day of placement perform one randomly selected placement test for each 3000 tons, or fraction of 3000 tons, of overrun.
 - ^[4] For 3-inch material or lift thickness of 3-inch or less, obtain samples at load-out.
 - ^[5] Divide the aggregate into uniformly sized sublots for testing
2. Stockpile testing for concrete pavement recycled in place will be sampled on the first day of production.
 3. Until a four point running average is established, individual placement tests will be used for acceptance. 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. Material represented by a subplot 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.

A.2.3 Department Testing

- (1) The department will perform testing as specified in B.8 except as follows:
 - Department stockpile verification testing prior to placement is optional for contract quantities of 500 tons or less.

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:
Transportation Materials Sampling Technician (TMS) Aggregate Technician I (AGGTEC-I) Aggregate Assistant Certified Technician (ACT-AGG)	Aggregate Sampling ^[1]
Aggregate Technician I (AGGTEC-I) 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-rsrcs/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 one business day after obtaining a sample. 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 one business day after obtaining a sample. 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 placement tests, include only QC placement 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) Perform one stockpile test from each source prior to placement.

- (3) Test gradation once per 3000 tons of material placed or fraction thereof. 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 or lift thickness of 3-inch or less 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.
- (4) Split each contractor QC sample and identify it according to CMM 8.30. Retain the split for seven calendar days in a dry, protected location. If requested for department comparison testing, deliver the split to the engineer within one business day.
- (5) The engineer may require additional sampling and testing to evaluate suspect material or the technician's sampling and testing procedures.
- (6) 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.
- (7) 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 four 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 four 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 two 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. Perform one stockpile test from each source prior to 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 or for a lift thickness of 3-inch or less, the department will collect samples 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 according to CMM 8-10.5.2 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.

stp-301-010 (20170615)

18. Protection of Concrete.

Supplement standard spec 415.3.14 as follows:

Provide for a minimum of one concrete finisher to remain on the project site after final finishing of all concrete surfaces until such time as the concrete has hardened sufficiently to resist surface scarring caused by footprints, handprints, or any other type of imprint, malicious or otherwise. Finisher must actively and continuously patrol on foot the newly placed concrete and repair any damage to the surface that might be sustained as described above.

Include the cost for providing the finisher(s), the necessary equipment, and materials in the contract unit price for each concrete item.

19. Concrete Identification Stamping.

Stamp ends of all monolithic Portland cement concrete surfaces with a stamp bearing the contractor's name and the year of construction. Make all letters 2 inches in height.

Include the cost of this work in the contract unit price for each concrete item and no additional payment will be made.

20. Concrete Masonry Bridges.

Perform this work according to standard spec 502, except as otherwise provided in the plans or in these special provisions.

The exterior face of concrete decks, walks, and curbs shall receive a sack-rubbed surface finish.

21. Expansion Device, B-40-544.

A Description

This special provision describes furnishing and installing an expansion device in accordance to standard spec 502, as shown on the plans, and as hereinafter provided.

B Materials

The minimum thickness of the polychloroprene strip seal shall be ¼-inch for non-reinforced elastomeric glands and 1/8-inch for reinforced glands. Furnish the strip seal gland in lengths suitable for a continuous one-piece installation at each individual expansion joint location. Provide preformed polychloroprene strip seals that conform to the requirements ASTM D3542, and have the following physical properties:

Property Requirements	Value	Test Method
Tensile Strength, min.	2000 psi	ASTM D412
Elongation @ Break, min	250%	ASTM D412
Hardness, Type A, Durometer	60 ± 5 pts.	ASTM D2240
Compression Set, 70 hours @212°F, max.	35%	D395 Method B Modified
Ozone Resistance, after 70 hrs. at 100°F under 20% Strain with 100 pphm ozone	No Cracks	ASTM D1149 Method A
Mass Change in Oil 3 after 70 hr. 212°F	45%	ASTM D471
Mass Change, max.		

Install the elastomeric strip seal gland with tools recommended by the manufacturer, and with a lubricant adhesive conforming to the requirements of ASTM D4070.

The manufacturer and model number shall be one of the following approved strip seal expansion device products:

Manufacturer	Model Number		
	Strip Seal Gland Size*		
	4-Inch	5-Inch	6-Inch
D.S. Brown	SSA2-A2R-400	SSA2-A2R-XTRA	SSA2-A2R-XTRA
R.J. Watson	RJA-RJ400	RJA-RJ500	RJA-RJ600
Watson Bowman Acme	A-SE400	A-SE500	A-SE800
Commercial Fabricators	A-AS400	-----	-----

*Expansion device strip seal gland size requirement of 4", 5", and 6" shall be as shown on the plans.

Furnish manufacturer's certification for production of polychloroprene represented showing test results for the cured material supplied, and certifying that it meets all specified requirements.

The steel extrusion or retainer shall conform to ASTM designation A 709 grade 36 steel. After fabrication, steel shall be galvanized conforming to the requirements ASTM A123.

Manufacturer's certifications for adhesive and steel shall attest that the materials meet the specification requirements.
stp-502-020 (20110615)

22. Polymer Overlay, Item 509.5100.S.

A Description

This special provision describes furnishing and applying two layers of a two-component polymer overlay system to the bridge decks shown on the plans. The minimum total thickness of the overlay system shall be ¼".

B Materials

B.1 General

Furnish materials specifically designed for use over concrete bridge decks. Furnish polymer liquid binders from the department's approved product list.

B.2 Polymer Resin

Furnish a polymer resin base and hardener composed of two-component, 100% solids, 100% reactive, thermosetting compound with the following properties:

Property	Requirements	Test Method
Gel Time ^A	15 - 45 minutes @ 73° to 75° F	ASTM C881
Viscosity ^A	7 - 70 poises	ASTM D2393, Brookfield RVT, Spindle No. 3, 20 rpm
Shore D Hardness ^B	60-75	ASTM D2240
Absorption ^B	1% maximum at 24 hr	ASTM D570
Tensile Elongation ^B	30% - 70% @ 7 days	ASTM D638
Tensile Strength ^B	2000 to 5000 psi @ 7 days	ASTM D638
Chloride Permeability ^B	<100 coulombs @ 28 days	AASHTO T277

^A Uncured, mixed polymer binder

^B Cured, mixed polymer binder

The required properties of the polymer resin when mixed with aggregate:

Property	Requirement ^C	Test Method
Minimum Compressive Strength	1,000 psi @ 8 hrs 5,000 psi @ 24 hrs	ASTM C579 Method B, Modified ^D
Thermal Compatibility	No Delaminations	ASTM C884
Minimum Pull-off Strength	250 psi @ 24 hrs	ASTM C1583

^C Based on samples cured or aged and tested at 75°F.

^D Plastic inserts that will provide 2-inch by 2-inch cubes shall be placed in the oversized brass molds.

B.3 Aggregates

Furnish natural or synthetic aggregates that are non-polishing, clean, free of surface moisture, fractured or angular in shape; free from silt, clay, asphalt, or other organic materials; and meet the following properties and gradation requirements:

Aggregate Properties:

Property	Requirement	Test Method
Moisture Content*	½ of the measured aggregate absorption, %	ASTM C566
Hardness	³ 6.5	Mohs Scale
Fractured Faces	100% with at least 1 fractured face & 80% with at least 2 fractured faces of material retained on No.16	ASTM D5821
Absorption	≤1%	ASTM C128

* Sampled and tested by the department prior to placement.

Gradation:

Sieve Size	% Passing by Weight
No. 4	100
No. 8	30 – 75
No. 16	0 – 5
No. 30	0 – 1

B.5 Approval of Bridge Deck Polymer Overlay System

A minimum of 20 working days prior to application, submit product data sheets and specifications from the manufacturer, and a certified report of test or analysis from an independent laboratory to the engineer for approval. The department will sample and test

the aggregates for gradation and moisture content prior to placement. If requested, supply the department with samples of the polymer for the purpose of acceptance testing.

B.5.1 Product Data Sheets and Specifications

Product data sheets and specifications from the manufacture consists of literature from the manufacturer showing general instructions, application recommendations/methods, product properties, general instructions, or any other applicable information.

B.5.2 Certified Report of Test or Analysis

Polymer Binder: Submit a certified report of test or analysis from an independent laboratory dated less than 3 years prior to the date of the project letting showing the polymer binder meets the requirements of section B.2.

Aggregates: Submit a certified report of test or analysis from an independent laboratory dated less than 6 months prior to the date of the project letting showing the aggregates meet the requirements of section B.3.

C Construction

C.1 General

Field Review: Conduct a field review of the existing deck to identify any possible surface preparation and material compatibility issues.

Pre-Installation Meeting: Conduct a pre-installation meeting with the manufacturer's representative and the engineer prior to construction. Discuss the field review findings, verification testing of the surface preparation and establish procedures for maintaining optimum working conditions and coordination of work. Furnish the engineer a copy of the recommended procedures and apply the overlay system according to the manufacturer's instructions. Supply for the engineer's use for the duration of the project, a Concrete Surface Profile (CSP) chip set of 10 from the International Concrete Repair Institute (ICRI).

Manufacturer's Representative: An experienced manufacturer's representative familiar with the overlay system installation procedures shall be present at all times during surface preparation and overlay placement to provide quality assurance that the work is being performed properly. This requirement may be reduced at the engineer's discretion.

Material Storage: Store and handle materials according to the manufacturer's recommendations. Store resin materials in their original containers in a dry area. Store all aggregates in a dry environment and protect aggregates from contaminants on the job site.

C.2 Deck Preparation

C.2.1. Deck Repair

Remove all asphaltic patches and unsound or disintegrated areas of the concrete decks as the plans show, or as the engineer directs. Work performed to repair the concrete deck will be paid for under other items. Ensure that products used for deck patching are compatible with the polymer overlay system.

NOTE: Some polymer systems require concrete patch material to be in place a minimum of 28-days before overlaying - contact polymer manufacturer before completing deck patching/repair.

C.2.2 Surface Preparation

Determine an acceptable shotblasting machine operation (size of shot, flow of shot, forward speed, and/or number of passes) that provides a surface profile meeting CSP 5 (medium-heavy shotblast) according to the ICRI Technical Guideline No. 310.2. If the engineer requires additional verification of the surface preparation, test the tensile bond strength according to ASTM C1593. The surface preparation will be considered acceptable if the tensile bond strength is greater than or equal to 250 psi or the failure area at a depth of ¼ inches or more is greater than 50% of the test area. Continue adjustment of the shotblasting machine and necessary testing until the surface is acceptable to the engineer or a passing test result is obtained.

Prepare the entire deck using the final accepted adjustments to the shotblasting machine as determined above. Thoroughly blast clean with hand-held equipment any areas inaccessible by the shotblasting equipment. Do not perform surface preparation more than 24 hours prior to the application of the overlay system.

Protect drains, expansion joints, access hatches, or other appurtenances on the deck from damage by the shot and sand blasting operations and from materials adhering and entering. Tape or form all construction joints to provide a clean straight edge.

Prior to shot blasting, remove pavement markings within the treatment area using an approved mechanical or blasting method.

Prepare the vertical concrete surfaces adjacent to the deck a minimum of 2" above the overlay according to SSPC-SP 13 (free of contaminants, dust, and loose concrete) by sand blasting, using wire wheels, or other approved method.

Just prior to overlay placement, clean all dust, debris, and concrete fines from the prepared surfaces including the vertical surfaces with compressed air. When using compressed air, the air stream must be free of oil. Any grease, oil, or other foreign matter that rests on or has absorbed into the concrete shall be removed completely. If any prepared surfaces (including the first layer of the polymer overlay) are exposed to rain or dew, lightly sandblast (brush/breeze blast) the exposed surfaces.

The engineer may consider alternate surface preparation methods per the overlay system manufacture's recommendations. The engineer will approve the final surface profile and deck cleanliness prior to the contractor placing the polymer overlay.

C.2.3 Transitional Area

If shown on the plans, create a transitional area approaching transverse expansion joints and ends of the deck using an approved mechanical or blasting method. Remove ¼" to 5/16" of concrete adjacent to the joint or end of deck and taper a distance of 3 feet.

If shown on the plans, create a transitional area on the approach pavement. Prep and place the first lift 3' beyond the end of the deck the same width as the deck. Prep and place the second lift 6' beyond the end of the deck the same width as the deck.

C.3 Application of the Overlay

Perform the handling and mixing of the polymer resin and hardening agent in a safe manner to achieve the desired results according to the manufacturer's instructions. Do not apply the overlay system if any of the following exists:

- a. Ambient air temperature is below 50°F or above 100°F.
- b. Deck temperature is below 50°F.
- c. Moisture content in the deck exceeds 4.5% when measured by an electronic moisture meter or shows visible moisture after 2 hours when measured according to ASTM D4263.
- d. Rain is forecasted during the minimum curing periods listed under C.5.
- e. Materials component temperatures below 65°F or above 99°F.
- f. Concrete age is less than 28 days unless approved by the engineer.
- g. The deck temperature exceeds 100°F.
- h. If the gel time is 10 minutes or less at the predicted high air temperature for the day.

After the deck has been shotblasted or during the overlay curing period, only necessary surface preparation and overlay application equipment will be allowed on the deck. Provide appropriate protective measures to prevent contamination from equipment allowed on the deck during preparation and application operations. Begin overlay placement as soon as possible after surface preparation operations.

The polymer overlay shall consist of a two-course application of polymer and aggregate. Each of the two courses shall consist of a layer of polymer covered with a layer of aggregate in sufficient quantity to completely cover the polymer. Apply the polymer and aggregate according to the manufacturer's requirements. Apply the overlay using equipment designed for this purpose. The application machine shall feature positive displacement volumetric metering and be capable of storing and mixing the polymer resins at the proper mix ratio. Disperse the aggregate using a method that provides a uniform, consistent coverage of aggregate and minimizes aggregate rolling or bouncing into final position. First course applications that do not receive enough aggregate before the polymer gels shall be removed and replaced. A second course applied with insufficient aggregate may be left in place, but will require additional applications before opening to traffic.

After completion of each course, cure the overlay according to the manufacturer's instructions. Follow the minimum cure times listed under C.5 or as prescribed by the manufacturer. Remove the excess aggregate from the surface treatment by sweeping, blowing, or vacuuming without tearing or damaging the surface; the material may be re-used if approved by the engineer and manufacturer. Apply all courses of the overlay system before opening the area to traffic. Do not allow equipment or traffic on the treated area until directed by the engineer.

After the first layer of coating has cured to the point where the aggregate cannot be pulled out, apply the second layer. Prior to applying the second layer, broom and blow off the first layer with compressed air to remove all loose excess aggregate.

Prior to opening to traffic, clean expansion joints and joint seals of all debris and polymer. A minimum of 3 days following opening to traffic, remove loosened aggregates from the deck, expansion joints, and approach pavement.

C.4 Application Rates

Apply the polymer overlay in two separate courses according to the manufacturer's instructions, but not less than the following rate of application.

Course	Minimum Polymer Rate ^A (GAL/100 SF)	Aggregate ^B (LBS/SY)
1	2.5	10+
2	5.0	14+

^A The minimum total applications rate is 7.5 GAL/100 SF.

^B Application of aggregate shall be of sufficient quantity to completely cover the polymer.

C.5 Minimum Curing Periods

As a minimum, cure the coating as follows:

	Average temperature of deck, polymer and aggregate components in °F							
Course	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-99
1	6 hrs.	5 hrs.	4 hrs.	3 hrs.	2.5 hrs	2 hrs	1.5 hrs.	1 hr.
2	8 hrs.	6.5 hrs.	6.5 hrs.	5 hrs.	4 hrs.	3 hrs.	3 hrs.	3 hrs.

If faster cure times are desired and achievable, submit to the engineer a certified test report from an independent laboratory showing the material is able to reach a compressive strength of 1000 psi as tested per ASTM C 579 Method B within the temperature ranges and cure times for which the product is proposed to be placed. Establish ambient air, material, and substrate temperatures from the manufacturer for field applications. Field applications will not be allowed below the documented temperatures.

C.6 Repair of Polymer Overlay

Repair all areas of unbonded, uncured, or damaged polymer overlay for no additional compensation. Submit repair procedures from the manufacturer to the engineer for approval. Absent a manufacturer's repair procedures and with the approval of the engineer, complete repairs according to the following: Saw cut the limits of the area to the top of the concrete; remove the overlay by scarifying, grinding, or other approved methods; shot blast or sand blast and air blast the concrete prior to placement of polymer overlay; and place the polymer overlay according to section C.3.

D Measurement

The department will measure Polymer 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
509.5100.S	Polymer Overlay	SY

Payment is full compensation for preparing the surface; for tensile bond testing; for creating the transitional area; for providing the overlay; for cleanup; and for sweeping/vacuuming and disposing of excess materials. Concrete Deck Repair will be paid for separately.
stp-509-030 (20170615)

23. Epoxy Injection Crack Repair, Item 509.9025.S; Cored Holes 2-Inch Diameter, Item 509.9026.S.

A Description

Repair structural cracks in the pier using the epoxy injection method, and core 2-inch diameter core samples from a crack in the concrete structure that has been repaired using the epoxy injection method, according to standard spec 509, as shown on the plans, as directed by the engineer, and as hereinafter provided.

B Materials

Furnish epoxy injection material that is insensitive to the presence of water and is composed of a two-component epoxy resin designed specifically for structurally re-bonding cracks in Portland cement concrete. The epoxy injection material shall conform to the following physical properties at 77 degrees F:

	Unmixed		Mixed
	Component A (Resin)	Component B (Catalyst)	
Weight per gallon, lbs	9.15 ±0.1	8.2 ±0.1	9.15 ±0.1
Viscosity, cps	500-700	120-160	275-350
Specific Gravity, g/cc	1.128 ±0.012	0.984 ±0.012	1.099 ±0.012
Color Straw	Straw	Straw	Straw
Shelf Life (closed containers)	2 years	2 years	---
Solids by Weight	---	---	100%
Pot Life (200 gram mass)	---	---	12-15 mins.
Mixing Ratio (by weight)	80%	20%	---
Mixing Ratio (by volume)	78%	22%	---
Bond Strength	---	---	2000 psi min
Shrinkage Resistance	---	---	ASTM C883
Thermal Compatibility	---	---	ASTM C884

Furnish surface seal material for confining the injected epoxy resin in the cracks that meets the following requirements:

- Adequate strength to hold the injection fittings firmly in place to resist injection pressures and prevent leakage during injection
- Non-sag consistency
- Insensitive to the presence of water
- Controlled cure time
- Two-component epoxy resin
- 100% solids by weight
- Applicable to wet surfaces
- Viscosity should be paste

C Construction

C.1 Injection Equipment

Use equipment to meter and mix the two-epoxy resin components and to inject the mixture into the cracks. The equipment shall be portable and have positive displacement type pumps equipped with an interlock to provide positive ration control of exact proportions of the two components at the nozzle. Use electric or air powered pumps that provide in-line metering and mixing.

Use injection equipment that has automatic pressure control capable of discharging the mixture at any present pressure up to 160 psi (± 5 psi), and is equipped with a manual pressure control override.

The equipment shall have the capability of maintaining the volume ratio for the mixture prescribed by the manufacturer of the epoxy resin material within a tolerance of $\pm 5\%$ by volume at any discharge pressure up to 160 psi.

The injection equipment shall be equipped with sensors on both the Component A and B reservoirs that will automatically stop the machine when only one component is being pumped to the mixing head.

C.2 Surface Area Preparation

Clean the surface areas adjacent to cracks of all dirt, dust, grease, oil, efflorescence, or other foreign matter, which may be detrimental to adhesion of the surface seal material. Acids and corrosives will not be permitted for cleaning.

Install injection ports along the cracks on both faces of the pier at intervals of 4 to 10 inches, or as appropriate to accomplish full penetration of the injection resin. Center the injection ports over the cracks and secure in place using surface seal material. Where possible, install the injection ports over the widest areas of the cracks.

Apply the surface seal material to the face of the crack between the entry ports. For known through cracks, apply the surface seal material to both faces of the member. Before proceeding with the injection operation, allow sufficient time to elapse for the surface seal material to gain adequate strength.

C.3 Epoxy Injection

Install the epoxy injection resin according to the manufacturer's instructions.

During installation, in general, limit pressures to 35 psi at the point of entry into the crack.

On vertical cracks, start the injection at the lowest point and continue upward along the crack. While injecting, resin should flow to and out of the next higher port. When this flow is established, cap the lower port and continue the injection until all ports have been injected and flow has been established between them.

On horizontal cracks, follow the same procedures used for vertical cracks; start the injection at one end and continue the injection in succession along the crack until all ports have been injected and flow has been established between them.

C.4 Finishing and Clean-Up

When cracks are completely filled, cure the epoxy resin for a sufficient length of time so that when the surface seal is removed, there is no draining or runback of the epoxy material from the cracks. Grind, or use other appropriate method, to remove surface seal material, excess epoxy material, and injection ports. No epoxy material shall extend beyond the plane of the surfaces of the in-situ concrete.

C.5 Core Sampling

To determine if the crack injection is complete, obtain two 2-inch diameter core samples from the repaired pier. Take the cores to the depth of the element or at least 12 inches. Take the cores at locations selected by the engineer. The engineer will have the option of increasing or decreasing the number of cores taken.

The injection shall be considered complete if more than 90% of the crack void, to 12 inches deep, is filled with the epoxy resin in each of the samples taken. If the injection is incomplete, re-injection and additional cores may be required.

Repair the core holes left in the member using one of the two following methods:

1. Fill core holes with an epoxy mortar consisting of one part epoxy injection resin to four parts clean, dry, bagged fine aggregate mixed by volume. Match the finish repair to the surrounding surface.
2. Fill core holes with an epoxy mortar consisting of one part epoxy gel to one part clean, dry, bagged fine aggregate mixed by volume. Match the finish repair to the surrounding surface.

D Measurement

The department will measure Epoxy Injection Crack Repair in length by the linear foot crack, acceptably repaired.

The department will measure Cored Holes 2-Inch Diameter as each individual cored hole as approved by the engineer and acceptably completed. Additional cores taken as required by the engineer after re-injection (due to incomplete injection) will not be measured for payment. Additional cores taken by the contractor that are not ordered by the engineer 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
509.9025.S	Epoxy Injection Crack Repair	LF
509.9026.S	Cored Holes 2-Inch Diameter	EACH

Payment is full compensation for furnishing and placing the epoxy sealant, including any cleaning before and after injection; coring samples of the work; inspecting the core samples; and for repairing the core holes left in the member.

stp-509-025 (20100709)

24. Structure Repainting General.

A General

A.1 Inspection

On all structures in this contract, notify the engineer of any missing or broken bolts or nuts, any missing or broken rivets, or of any cracks or flaws in the steel members while cleaning or painting.

A.2 Date Painted

At the completion of all painting work, stencil in black paint or contrasting color paint the date of painting the bridge. The numbers shall be three inches (75 mm) in height and shall show the month and year in which the painting was completed: e.g., 11-95 (November 1995). On each bridge painted, stencil the date at two locations. On truss bridges, stencil the date on the cover plates of end posts near and above the top of the railings at the oncoming traffic end. On steel girder bridges, stencil the date on the **inside** of the outside stringers at the abutments. The date on grade separation bridges shall be readable when going under the structure or at some equally visible surface near the ends of the bridge, as designated by the engineer.

A.3 Graffiti Removal

Remove any graffiti on concrete abutments, piers, pier caps, parapet railings, slope paving or any other location at the direction of the engineer. Use a brush sandblast to remove graffiti.

The above work will not be measured and paid for separately, but will be considered incidental to other items in the contract.

B (Vacant)

C Construction

C.1 Repainting Methods

Do not perform blasting, cleaning and painting on days of high winds. Prevailing winds in excess of 15 mph (25 km/hr) shall be considered high winds.

Place the final field coat of paint on the exterior of the exterior beams as a continuous painting operation. Stop at splices, vertical stiffeners or other appropriate locations so that lap marks are not evident or noticeable.

Completely clean and remove spent abrasive and other waste materials resulting from the contractor's operation from bridge deck surfaces, gutter lines, drains, curbs, bridge seats, pier caps, slope paving, roadway below, and all structural members and assemblies.

C.2 Inspection

Add the following to standard spec 105.9:

Furnish, erect and move scaffolding and other appropriate equipment to permit the inspector the opportunity to closely observe all affected surfaces. The scaffolding, with appropriate safety devices, shall meet the approval of the engineer.
stp-517-005 (20150630)

25. Painting Epoxy System B-40-544.

A Description

This special provision describes work that shall be according to standard spec 517 and as hereinafter provided:

B Materials

B.1 Coating System

Furnish a complete coating system from the department's approved list. The color of epoxy shall be white and the urethane coating material shall match the color number shown on the plans according to Federal Standard Number 595B, as printed in 1989. Supply the engineer with the product data sheets before any coating is applied. The product data sheets shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, the minimum drying time for shop applied coats, and the recommended procedures for coating galvanized bolts, nuts, and washers.

C Construction

Modify the fourth paragraph of standard spec 517.3.1.7.2 to read:

On all other areas including the outside surfaces of splice plates, the minimum dry film thickness above the surface profile for the primer coat shall be 3.0 mils (0.076 mm).
stp-517-041 (20040820)

26. Preparation and Coating of Top Flanges B-40-544, Item 517.0900.S.001.

A Description

This special provision describes thoroughly cleaning and coating the top surface and edges of the top flanges, removing loose paint, rust, mill scale, dirt, oil, grease, or other foreign substances until the specified finish is obtained.

B (Vacant)

C Construction

For top flanges and edges that have no paint on them and according to the department's Pre-Qualified Paint Systems for Structure Overcoating Cleaning and Priming, clean the top surface and edges of the top flanges and paint them with one coat of an approved zinc rich primer. Paint for Solvent Cleaning for Overcoat-minimum Cleaning (SP-1) is not allowed.

For top flanges and edges that have paint on them and according to the department's Pre-Qualified Paint Systems for Structure Overcoating Cleaning and Priming, clean all areas of rust and loose paint on the top surface and edges of the top flanges. Wash the top surface and edges of the top flanges and paint them with one coat of an approved zinc-rich primer according to paint manufacture's recommendations. If flash rusting occurs prior to the application of the primer, stop painting application, remove the flash rusting and paint cleaned surface. Paint for Solvent Cleaning for Overcoat-minimum Cleaning (SP-1) is not allowed.

Where plans call for the cleaning of other painted structural steel including hanger assemblies, bearings, field splices, and connections, clean areas of loose paint and rust according to the department's Pre-Qualified Paint Systems for Structure Overcoating Cleaning and Priming, or and according to paint manufacture's cleaning recommendations. Sound paint need not be removed with the exception of an area 12-inch on either side of hanger assembly centerlines. Clean this area to base metal according to the paint manufacture's cleaning recommendations and paint them one coat of an approved zinc-rich primer according to paint manufacture's recommendations. Paint for Solvent Cleaning for Overcoat-minimum Cleaning (SP-1) is not allowed.

For areas of exposed steel members that are to be imbedded in new concrete and according to the department's Pre-Qualified Paint Systems for Structure Overcoating Cleaning and Priming, thoroughly clean the surface area of exposed steel members that are to be imbedded in the new concrete and solvent wash and paint one coat of an approved zinc rich primer according to paint manufacture's recommendations to these areas. Paint for Solvent Cleaning for Overcoat-minimum Cleaning (SP-1) is not allowed.

According to the approved project specific hazardous material containment plan, furnish and erect tarpaulins or other materials to collect all of the spent paint containing material resulting from blasting or hand and power tool cleaning and coating. Minimize dust during all clean-up activities. Collect and store waste material at the end of each work day or more often if needed. Store waste materials in the hazardous waste containers provided. Lock and

secure all waste containers at the end of each work day. Cover the container(s) at all times except when adding or removing waste material. Store the containers in an accessible and secured area, not located in a storm water runoff course, flood plain or exposed to standing water. Transportation and disposal of such waste material will be the responsibility of the department.

Damage to existing painted surfaces as a result of construction operations, shall be restored to the approval of the engineer at the contractor's expense.

D Measurement

The department will measure Preparation and Coating of Top Flanges B-40-544 as a single complete lump sum unit of work for the structure, completed according to the contract and accepted.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
517.0900.S.001	Preparation and Coating of Top Flanges B-40-544	LS

Payment is full compensation for preparing and cleaning the designated surfaces; and for furnishing and applying the coating.
stp-517-010 (20140630)

27. Concrete Staining B-40-544, Item 517.1010.S.001.

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 Surfer, Smooth by TK Products
Tri-Sheen Acrylic by TK Products
TK-1450 Natural Look Urethane Anti-Graffiti Primers by TK Products
Safe-Cure & 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 45° 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 measure Concrete Staining B-40-544 in area by the square foot of surface, acceptably prepared and stained.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
517.1010.S.001	Concrete Staining B-40-544	SF

Payment is full compensation for furnishing and applying the two coat system; for preparing the concrete surface; and for preparing the sample panels.
stp-517-110 (20140630)

28. Structure Repainting Recycled Abrasive B-40-544, Item 517.1800.S.001.

A Description

This special provision describes surface preparation and painting of the metal surfaces according to the manufacturer's recommendations and as hereinafter provided.

A.1 Areas to be Cleaned and Painted

All structural metal surfaces of:

1. Structure B-40-544 36,815 SF.

Areas are approximate and given for informational purposes only.

B Materials

B.1 Coating System

Furnish a complete coating system from the department's approved list for "Structure Repainting Recycle Abrasive Structure". The color for the finish coating material shall match the color number shown on the plans according to Federal Standard Number 595B, as printed in 1989. Supply the engineer with the product data sheets for approval before any coating is applied. The product data sheets shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, and the minimum drying time between coats.

The color of the primer must be such that a definite contrast between it and the color of the blasted steel is readily apparent. There shall be a color contrast between all subsequent coats for the paint system selected. Submit color samples of the primer and all coats to the engineer for approval prior to any application of paint.

C Construction

C.1 Surface Preparation

Prior to blast cleaning, solvent clean all surfaces to be coated according to SSPC-SP1.

All metal surfaces must be blast cleaned according to SSPC-SP10 and verified prior to painting.

Upon completion of surface preparation, test representative surfaces, which were previously rusted (i.e. pitted steel) for the presence of residual chloride. Perform Surface Contamination Tests (SCAT) according to the manufacturer's recommendations. The tests must be witnessed by the engineer. If chlorides are detected at levels greater than $7\mu\text{g}/\text{cm}^2$, continue to clean the affected areas until results are below the specified limit. Submit anticipated testing frequencies and chloride remediation methods to the engineer for review and approval.

Apply the prime coat the same day that the metal surfaces receive the No. 10 blast or re-blast before application. Cleaned surfaces shall be of the specified condition immediately prior to paint application. If rust bloom occurs prior to applying the primer, stop the painting operation in the area of the rust bloom and re-blast and clean the area to SSPC SP-10 prior to applying the primer.

The steel grit and any associated equipment brought to the site and used for blast cleaning shall be clean. Remove immediately dirty grit or equipment brought to the site at no expense to the department. Furnish an abrasive that has a gradation such that it will produce a uniform surface profile between 1 to 3 mils on the steel surface, as measured according to ISO 8503-5.

The abrasive blasting and recovery system shall be a completely integrated self-contained system for abrasive blasting and recovery. It shall be an open blast and recovery system that will allow no emissions from the recovery operation. The recovery equipment shall be such that the amount of contaminants in the clean recycled steel grit shall be less than 1 percent by weight as per SSPC AB-2.

Remove by grinding all fins, tears, slivers, and burred or sharp edges that are present on any steel member, or that appear during the blasting operation, and re-blast the area to give a 1 to 3 mils surface profile.

Remove all spent material and paint residue from steel surfaces with a good commercial grade vacuum cleaner equipped with a brush-type cleaning tool, and test cleanliness according to ASTM D4285. The airline used for surface preparation shall have an in-line water trap and the air shall be free of oil and water as it leaves the airline.

Take care to protect freshly coated surfaces from subsequent blast cleaning operations. Thoroughly wire brush damaged primed surfaces with a non-rusting tool, or if visible rust occurs, re-blast to a near white condition. Clean and re-prime the brushed or blast cleaned surfaces according to this specification.

C.2 Coating Application

Apply paint according to the manufacturer's recommendations in a neat workmanlike manner. Paint application shall normally be by airless spray or inaccessible areas by brush, roller or other methods approved by the engineer.

The engineer may allow the use of conventional spray equipment after satisfactory demonstration by the contractor of the proper application technique and handling of that equipment.

Mix the paint or coatings according to the manufacturer's directions to a smooth lump-free consistency. Keep paint thoroughly mixed during the painting application.

After the inspector approves the entire cleaned surface to be coated, apply a prime coat uniformly to the entire surface. Either before or after applying the prime coat, brush or spray a stripe coat of primer on all plate edges, bolt heads, nuts, and washers. Apply succeeding coats as the product data sheet shows.

Remove all dry spray by vacuuming, wiping, or sanding if necessary.

If the application of the coating at the required thickness in one coat produces runs, bubbles, or sags; apply a "mist-coating" in multiple passes of the spray gun; separate the passes by several minutes. Where excessive coating thickness produces "mud-cracking", remove such coating back to soundly bonded coating and re-coat the area to the required thickness.

The resultant paint film shall be smooth and uniform, without skips or areas of excessive paint according to SSPC PA1.

The coating is supplied for normal use without thinning. If in cool weather it is necessary to thin the coating for proper application, thin according to the manufacturer's recommendations.

During surface preparation and coating application the ambient and steel temperature shall be between 39 degrees F and 100 degrees F. The steel temperature shall be at least 5 degrees F above the dew point temperature. (This requires the steel to be dry and free of any condensation or ice regardless of the actual temperature of the steel.) The relative humidity

shall not exceed 85%. The manufacturer's ambient condition requirements must be followed if they are more stringent.

Paint thickness shall be within the requirements for a three coat paint system listed in the department's approved list for Structure Repainting Recycle Abrasive Structure and the paint system being used.

Time to recoat shall be according to the manufacturer's recommendations.

The dry film thickness will be determined by use of a magnetic film thickness gage. The gage shall be calibrated for dry film thickness measurement according to SSPC-PA 2. Dry film thickness in each area measured will be based on an average of three gage readings, after calibration of the gage to account for surface profile of the bare steel as a result of surface preparation.

D Measurement

The department will measure Structure Repainting Recycled Abrasive B-40-544 as a single complete lump sum unit of work, completed according to the contract and accepted.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
517.1800.S.001	Structure Repainting Recycled Abrasive B-40-544	LS

Payment is full compensation for preparing and cleaning the designated surfaces; furnishing and applying the paint; and for providing the listed equipment.
stp-517-050 (20150630)

29. Labeling and Disposal of Waste Material.

The EPA ID number for Structure B-40-544 will be provided by the engineer.

Presently, the state has an exclusive mandatory use contract with a private waste management contractor to transport and dispose of hazardous waste.

The state's waste management contractor shall furnish and deliver appropriate hazardous waste containers and site-specific labels to each bridge site. The provided containers shall be placed at pre-selected drop-off and pick-up points at each bridge site, and these locations shall be determined at the preconstruction conference. The custody of the containers and labels shall be the responsibility of the painting contractor while they are at the job site.

Report all reportable spills and discharges according to the contingency plan.

Labels are site-specific. Check the labels to ensure that the project ID, structure number, and EPA ID match the structure generating the waste. Apply a label to each drum when it is opened for the first time. Fill in the date on the label the first day material is accumulated in the drum. The following page is an example of a properly filled-in label.

During paint removal operations, continuously monitor and notify the project inspector of the status of waste generation and quantity stored so that timely disposal can be arranged.
stp-517-055 (20100709)

HAZARDOUS WASTE

WW-5257580999-001-01-0

STORAGE LABEL

DOT SHIPPING DESCRIPTION

RQ, HAZARDOUS WASTE, SOLID, n.o.s.,
(LEAD), 9, NA3077, III, (D008)

Enter the date that waste materials
were first placed into the container

EPA CODE: E/D008 STATE: S

WIP#: 391498

WIP DESC: BRIDGE SAND WITH LEAD

DATE ACCUMULATED: 07/01/2005

HAZARDOUS WASTE – FEDERAL LAW PROHIBITS IMPROPER DISPOSAL IF FOUND, CONTACT THE
NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

WISC DOT BRIDGE # B-29-53/54

I-94 OVER CTH H

PROJECT ID # 5882-03-70

CAMP DOUGLAS, WI 54618

(608) 963-0871

GENERATOR EPA ID
WIR000121103

Project ID Number on
label must match the
Project Number assigned
by the WIDOT

Bridge Number and
Address on label must
match specific bridge from
which waste was generated.

EPA ID Number on label
is specific to the bridge
from which the waste is
generated.

30. Structure Overcoating Cleaning and Priming B-40-544, Item 517.3000.S.001.

A Description

This special provision describes cleaning and painting with two or three coats of paint the metal surfaces as hereinafter provided.

A.1 Areas to be Cleaned and Painted

Structure B-40-544

1. Two Coat Area: 7,000 SF with SP 1 cleaning. (Existing Steel Grating)

B (Vacant)

C Construction

C.1 Surface Preparation

Prior to overcoating or hand tool cleaning, solvent clean all surfaces to be coated according to SSPC-SP1. A SSPC-SP 2 hand Tool Cleaning according to Steel Structures Painting Council Specification 2 will be required on all metal surfaces to be painted with a three-coat system. Prime the same day, or re-clean before application, all metal surfaces receiving a No. 2 cleaning.

Remove all abrasive or paint residue from steel surfaces with a High Efficiency Particulate Abatement (HEPA-VAC) vacuum cleaner equipped with a brush-type cleaning tool, or by double blowing. If the double blowing method is used, vacuum the exposed top surfaces of all structural steel, including flanges, longitudinal stiffeners, splices, plates, and hangers, after the double blowing operations are completed. The air line used for blowing the steel clean shall have an inline water trap and the air shall be free of oil and water as it leaves the air line.

Take care to protect freshly coated surfaces from subsequent cleaning operations. Thoroughly wire brush damaged primed surfaces with a non-rusting tool. Clean and re-prime the brushed surfaces within the time recommended by the manufacturer.

C.2 Painting

Paint by applying two or three coats of an approved coating system as specified herein to the surfaces as described in A.1 from the department's approved products list.

C.3 Coating Application

Apply paint in a neat, workmanlike manner. The resultant paint film shall be smooth and uniform without skips or areas of excessive paint. Apply coating according to the manufacturer's recommendations.

Prior to applying the prime coat, coat with primer all edges, rivet and bolt heads, nuts and washers by using either a brush, roller, or spray application.

Dry Film Thickness per coat shall be a minimum of 3-mil. The dry film thickness shall be determined by use of a magnetic film thickness gage. The gage shall be calibrated for dry film thickness measurement according to SSPC-PA 2.

During surface preparation and coating application, the ambient and steel temperature shall be between 39 and 100 degrees F. The steel temperature shall be at least 5 degrees F above the dew point temperature, and the relative humidity shall not exceed 85%.

D Measurement

The department will measure Structure Overcoating Cleaning and Priming (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
517.3000.S.001	Structure Overcoating Cleaning and Priming B-40-544	LS

Payment is full compensation for preparing and cleaning the designated surfaces; and for furnishing and applying the paint.
stp-517-036 (20080501)

31. Negative Pressure Containment and Collection of Waste Materials, B-40-544, Item 517.4500.S.001.

A Description

This special provision describes providing a dust collector to maintain a negative air pressure in the enclosure; furnishing and erecting enclosures as required to contain, collect and store waste material resulting from the preparation of steel surfaces for painting, and repainting, including collection of such waste material, and the labeling and storage of waste material in approved hazardous waste containers, all as hereinafter provided.

B (Vacant)

C Construction

Erect an enclosure to completely enclose (surround) the blasting operations. The ground, slope paving, or roadway cannot be used as the bottom of the enclosure unless covered by approved containment materials. So that there are no visible emissions to the air or ground or water, design, erect, operate, maintain and disassemble the enclosures in such a manner to effectively contain and collect dust and waste materials resulting from surface preparation and paint over spray. Suspend all enclosures over water from the structure or as approved by the engineer.

Construct the enclosure of flexible materials such as tarpaulins or of rigid materials such as plywood, or of a combination of flexible and rigid materials and meet SSPC Guide 6 requirements with Level 1 emissions. Systems manufactured and provided by Eagle Industries, Detroit Tarps, or equal, are preferred. The tarpaulins shall be a non-permeable

material, either as part of the tarp system or have a separate non-permeable lining. Maintain all materials free of tears, cuts or holes. The vertical sides of the enclosure shall extend from the bottom of the deck down to the level of the covered work platform or covered barge where used for structures over water, and shall be fastened securely to those levels to prevent the wind from lifting them. Bulkheads are required between beams to enclose the blasting area as approved by the engineer. Where bulkheads are required, construct them of plywood and properly seal them. To prevent spent materials and paint over spray from escaping the enclosed area, overlap and fasten together all seams. Place groundcovers under all equipment prior to operations or as approved by the engineer.

To allow proper cleaning, inspection of structures or equipment, and painting, provide safe adequate artificial lighting in areas where natural light is inadequate.

Provide a dust collector so that there are no visible emissions outside of the enclosure and so that a negative air pressure inside the enclosure is maintained. The dust collector shall be sized to maintain the minimum air flow based on the cross-sectional area of the enclosure.

A combination of positive air input and negative air pressure may be needed to maintain the minimum airflow within the enclosure.

Filter all air exhausted from the enclosure to create a negative pressure within the enclosure so as to remove all hazardous and other particulate matter.

After all debris has been removed and all painting has been approved in the containment area is complete, remove containment according to SSPC Guide 6.

As a safety factor for structures over water, provide for scum control. Provide a plan for corrective measures to mitigate scum forming and list the procedures, labor and equipment needed to assure compliance. Effectively contain the scum that forms on the water and does not sink in place from moving upstream or downstream by the use of floating boom devices.

If in the use of floating boom devices the scum tends to collect at the devices, contain, collect, store the scum, and do not allow it to travel upstream or downstream beyond the devices. Remove the scum at least once a day or more often if needed.

Collect and store at the bridge site for disposal all waste material or scum collected by this operation, or any that may have fallen onto the ground tarps. Collect and store all waste material and scum at the end of each workday or more often if needed. Storage shall be in provided hazardous waste containers. Label each container as it is filled, using the labels provided by the Hazardous Waste Disposal contractor. Check the label and ensure that the project ID, bridge number and EPA ID match the structure. Fill in the generation date when the first material is placed in the container. Secure all containers at the end of each workday. Keep the containers covered at all times except to add or remove waste material. Store the containers in an accessible and secured area, not located in a storm water runoff course, flood plain, or exposed to standing water.

In a separate operation, recover the recyclable abrasive for future application, and collect the paint and/or corrosion particles for disposal.

D Measurement

The department will measure Negative Pressure Containment and Collection of Waste Materials B-40-544 as a single complete lump sum unit of work for each structure designated in the contract, completed according to the contract and accepted,

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
517.4500.S.001	Negative Pressure Containment and Collection of Waste Materials B-40-544	LS

Payment is full compensation for designing, erecting, operating, maintaining, and disassembling the containment devices; providing negative pressure exhaust ventilation; collecting, labeling, and for storing spent materials in provided hazardous waste containers. stp-517-065 (20140630)

32. Portable Decontamination Facility, Item 517.6001.S.

A Description

This special provision describes furnishing and maintaining weekly, or more often if needed, a single unit portable decontamination facility as hereinafter provided.

B Materials

Supply and operate all equipment according to OSHA.

Supply adequate heating equipment with the necessary fuel to maintain a minimum temperature of 68° F in the facility.

The portable decontamination facility shall consist of a separate "Dirty Room", "Shower Room" and "Clean Room". The facility shall be constructed so as to permit use by either sex. The facility shall have adequate ventilation.

The "Dirty Room" shall have appropriately marked containers for disposable garments, clothing that requires laundering, worker shoes, and any other related equipment. Each container shall be lined with poly bags for transporting clothing, or for disposal. Benches shall be provided for personnel.

The "Shower Room" shall include self-contained individual showering stalls that are stable and well secured to the facility. Provide showers with a continuous supply of potable hot and cold water. The wastewater must be retained for filtration, treatment, and/or for proper disposal.

The "Clean Room" shall be equipped with secure storage facilities for street clothes and separate storage facilities for protective clothing. The lockers shall be sized to store clothing, valuables and other personal belongings for each worker. Benches shall be provided for personnel.

Supply a separate hand wash facility, either attached to the decontamination facility or outside the containment.

C Construction

Properly contain, store, and dispose of the wastewater.

D Measurement

The department will measure Portable Decontamination Facility 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
517.6001.S	Portable Decontamination Facility	EACH

Payment is full compensation for furnishing and maintaining a portable decontamination facility.

stp-517-060 (20140630)

33. Traffic Control.

Perform the work under this item according to the requirements of standard spec 643, as shown on the plans or as approved by the engineer, except as herein modified.

Permanently label each barricade, sign or other traffic control device with the name and telephone number for 24-hour emergency service, printed in letters at least $\frac{3}{4}$ inches in height.

No operation may proceed until all traffic control devices for such work are in the proper location.

During the life of this contract, provide 24 hour-a-day availability of equipment and forces to promptly restore barricades, lights, signs or other traffic control devices that are damaged or disturbed. In no case may any barricade, light, sign or other traffic control device be out of service for more than 2 hours. The cost to maintain and restore the above items is incidental to the bid item Traffic Control and no additional payment will be made therefore.

Have available at all times sufficient experienced personnel to promptly install, remove and reinstall the required traffic control devices to route traffic in order to perform the operations.

Provide the City of Milwaukee Police Department and the engineer a current telephone number with which the contractor or his representative can be contacted during non-working hours in the event a safety hazard develops.

Mask out all traffic control signs and have flags removed when not in use.

The traffic requirements are subject to change at the direction of the engineer in the event of an emergency.

Receive prior approval from the engineer for the location of egress or ingress for construction vehicles to prosecute the work.

Park or store equipment and materials only at work sites approved by the engineer.

Do not disturb, remove, or obliterate any traffic control signs, advisory signs, shoulder delineators, or beam guard in place along the traveled roadways without the approval of the engineer.

Install appropriate advance and intermediate warning signs of standard design. Install the signs at locations indicated on the plan and at locations as directed by the engineer according to Part VI of the Manual of Uniform Traffic Control Devices. Sign shape, message and color must be according to Part VI of the Manual of Uniform Traffic Control Devices. All signs must be reflectorized.

34. Construction Staking Structure Layout.

Supplement standard spec 650 with the following:

Stake each plan grade so that the form-setters and inspector can check the grade and alignment.

35. Construction Staking Electrical Installations 2195-03-70, Item 650.8500.001.

The work under this item shall be performed according to the requirements of standard spec 650, and as shown in the plans.

The street lighting poles and vaults are both stationed to the center with the conduit stationed at the ends. See drawing details for any additional information.

36. Lightweight Concrete Masonry, Item SPV.0035.501.

A Description

This special provision describes furnishing and installing lightweight concrete on portions of the lift span adjoining the approach span according to standard spec 502, as shown on the plans, and as herein provided.

B Materials

The lightweight concrete masonry shall weigh between 105-115 lbs and the compressive strength of the lightweight concrete at 28 days should be a minimum of 4,000 psi. Submit the concrete mix design for the engineer's approval prior to using the material for the project. Assure the strength and weight of the concrete by performing a minimum of three batch mixes and submit along with the concrete mix design for approval to assure the requirements as given above.

The high strength coated bar steel reinforcement shall follow the standard specifications as given in standard spec 505.

C (Vacant)**D Measurement**

The department will measure Lightweight Concrete Masonry, completed according to the contract and accepted by the quantity per cubic yard of lightweight concrete properly formed, poured leveled, and cured for the areas shown on the plans.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0035.501	Lightweight Concrete Masonry	CY

Payment for Lightweight Concrete Masonry is full compensation for providing concrete, forms and falseworks; for placing, finishing, curing, and protecting the concrete; for fabricating and testing cylinders, evaluating the maturity, and for furnishing all other labor, material, equipment, and incidentals necessary to complete the work.

37. Inlet Screen Type M, Item SPV.0060.001.**A Description**

This special provision describes furnishing, installing, and maintaining proper inlet screens as directed by the engineer, as shown on the drawings, and as hereinafter provided.

B Materials

Use woven filtration geotextile fabric with the following physical properties:

<u>Test</u>	<u>Method</u>	<u>Value</u>
Grab Tensile Strength (lbs)	ASTM D-4632	180 min.
Mullen Burst (lbs/in ²)	ASTM D-3786	200 min.
Equivalent Sieve Size	ASTM D-4751	US No. 30 max.
Water Flow Rate (gpm/ft ²)	ASTM D-4491	140 min.
Permitivity (Sec ⁻¹)	ASTM D-4491	1.9 min.
Permeability (cm/sec)	ASTM D-4491	0.14 min.

C Construction

C.1 Installation

The control of soil erosion requires flexibility to accommodate changing conditions as the construction project progresses. In general, install the erosion control device at locations as described on the plan.

At all inlet locations, install a Type M screen. If the inlet being protected has a side inlet box, seal the inlet box until inlet protection is no longer needed. These screens must be in place prior to the start of any work, including sawing.

On reconstruction projects, install Type M screens at all inlets and storm or combined sewer manholes. Install these screens, or some other device or method acceptable to the engineer, for preventing infiltration of solids into the sewer system, on the day that removal takes place. When it becomes necessary to remove a brick from a drainage structure in order to drain the subgrade filter screen, use approximately the size and shape of one-half of the Type R screen. Pay for the cost of providing this protection, as well as that required for storage piles of earth, gravel, stone, or other debris. Should the frame on the structure be removed or an opening occurs beneath the frame, install additional erosion control in the form of Type R as part of maintaining erosion control.

C.2 Maintenance

Continue cleaning and repair of all types of control devices until the engineer accepts the work. All such cleaning and repair, as well as the eventual removal of the devices, is the responsibility of the contractor.

Completely clean out manholes into which dirt or other debris has fallen before the end of each work day. Should the contractor not perform the cleaning as required, his operation may be shut down until the situation is corrected.

Protect all control measures protruding above the normal paved and/or ground surface where vehicular and/or pedestrian traffic is being maintained by barricades with flashing lights.

Inspect the inlet basket within 24 hours after each rainfall or daily during extended periods of precipitation. Make repairs immediately, as necessary, to prevent particles from reaching the sewerage system and/or causing the surface flooding.

Remove sediment deposits after each storm event or as often as the fabric becomes clogged. Failure to maintain clean, debris free inlet baskets may result in the contractor's operations being shut down.

D Measurement

The department will measure Inlet Screens Type M 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.0060.001	Inlet Screen Type M	EACH

Payment is full compensation for the number of actual devices supplied, installed and properly maintained; and for furnishing all labor, tools, equipment and incidentals necessary to complete the work.

38. Adjusting Water Boxes, Item SPV.0060.003.

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 Mr. Gil Taylor, Milwaukee Water Works, at (414) 708-9005 (or Mr. 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 the Department of Public Works Field Headquarters – Infrastructure, Operations, Water Works at 3850 North 35th Street. Materials being returned must be accompanied with a “surplus material” form completed by the public works inspector assigned to the project.

C Construction

All water service boxes and water gate valve boxes within the project limits shall be adjusted to proposed elevations by the contractor using materials meeting city specifications.

The city will locate, mark, inspect and repair all water service boxes and water gate valve boxes within the limits of the project prior to commencement of work on the project.

Throughout the duration of the project, the contractor must ensure that all water service boxes and water gate valve boxes are adequately located and identified by blue paint, and that at all times, all water appurtenances remain accessible for operation by city forces. Exercise caution working adjacent to water facilities to avoid damage and ensure accessibility.

Upon completion of the contract, the city will inspect all water facilities to ensure the water boxes and manholes 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.0060.003	Adjusting Water Boxes	EACH

Payment is full compensation for furnishing all excavation, backfilling, disposal of surplus materials, water box or manhole clean-out, and restoration of the work site; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

39. Utility Line Opening, Item SPV.0060.004.**A Description**

This special provision describes excavating to uncover utilities for the purpose of determining elevation or location and potential conflicts as shown on the plans or as directed by the engineer.

B (Vacant)**C Construction**

Perform the excavation in such a manner that the utility in question is not damaged and the safety of the workers is not compromised.

Perform the utility line openings as soon as possible and at least 10 days in advance of proposed utility construction to allow any conflicts to be resolved with minimal disruption. Give the engineer a minimum of three working days once utility line opening information is received to review all relevant design information prior to proposed utility construction. Where utilities are within 6 feet of each other at a potential conflict location, only one utility line opening will be called for. In these cases, a single utility line opening will be considered full payment to locate multiple utilities. Utility line openings include a trench up to 10 feet long as measured at the trench bottom, and of any depth required to locate the intended utility.

Approve and coordinate all utility line openings with the engineer. Notify the utility engineers or their agents of this work a minimum of 3 days prior to the work so they may be present when the work is completed.

Replace pavement over utility line opening trenches which are within the staged traffic area as directed by the engineer. Replace pavement and open to traffic within 24 hours of the excavation.

D Measurement

The department will measure Utility Line Opening 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.0060.004	Utility Line Opening	EACH

Payment is full compensation for the excavation required to expose the utility line; backfilling with existing material removed from the excavation; compacting the backfill; restoring the site; and for cleanup.

Existing pavement, concrete curb, gutter, and sidewalk removals necessary to facilitate utility line openings are not considered part of or paid for under Utility Line Openings, but are considered separate and measured and paid for separately as removal items. Pavement replacement material, concrete curb, gutter, and sidewalk items will also be considered separate from Utility Line Openings and will be measured and paid for separately.

40. Pedestal Bases Black, Item SPV.0060.201; Traffic Signal Standards Aluminum 3.5-FT Black, Item SPV.0060.202; Traffic Signal Standards Aluminum 13-FT Black, Item SPV.0060.203.

A Description

This special provision describes furnishing and installing Pedestal Bases 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 shall 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 engineer 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 Cl (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, Poles (type) Black, 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.0060.201	Pedestal Bases Black	EACH
SPV.0060.202	Traffic Signal Standards Aluminum 3.5-FT Black	EACH
SPV.0060.203	Traffic Signal Standards Aluminum 13-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.

41. Fiberglass/Polymer Concrete Pull Box 13-Inch x 24-Inch x 24-Inch, Item SPV.0060.301; Fiberglass/Polymer Concrete Pull Box 17-Inch x 30-Inch x 24-Inch, Item SPV.0060.302.

A Description

This special provision describes furnishing and installing Fiberglass/Polymer Concrete Pull Box at the locations shown on the plans according to standard spec 653.

B Materials

Furnish fiberglass/polymer concrete pull box of rectangular composite enclosure with Tier 15 Rating (15,000 lb Design Load) and (22,500 lb Test Load), and nominal 13” wide x 24” long and 24” total depth, flared wall style #CHB132424 as by Highline Products or #B12132424A as by Hubbell Power Systems, or approved equal. Cover shall be Tier 15 Rating (15,000 lb Design Load) and (22,500 lb Test Load), bolted cover with logo “ Street Lighting” #CHC1324HLL as by Highline Products or #C12132402A41 as by Hubbell Power Systems, or approved equal. The pull box shall be listed and labeled by (UL) or other Nationally Recognized Testing Laboratory.

C Construction

Conform to standard spec. 673.3 and City of Milwaukee standards. The pull box shall be installed on 12-inches of crushed stone, set flush with grade and backfilled.

D Measurement

The department will measure Fiberglass/Polymer Concrete Pull Box 13-Inch x 24-Inch x 24-Inch and Fiberglass/Polymer Concrete Pull Box 17-Inch x 30-Inch x 24-Inch as each individual pull box, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.301	Fiberglass/Polymer Concrete Pull Box 13-Inch x 24-Inch x 24-Inch	EACH
SPV.0060.302	Fiberglass/Polymer Concrete Pull Box 17-Inch x 30-Inch x 24-Inch	EACH

Payment is full compensation for furnishing and installing all materials, including pull box, crushed aggregate, for excavation, backfill, for disposing of surplus material.

42. Installing City -Furnished Concrete Light Pole Base, Item SPV.0060.303.

A Description

This special provision describes installing a city-furnished concrete light pole base. All work shall be according to standard spec 651.

B Materials

The concrete light pole base furnished by the City of Milwaukee will be 22 inches in diameter by 36 inches tall with an 11 inch bolt circle, and embedded conduit.

C Construction

Pick up concrete light pole base from the City of Milwaukee yard located at 1540 W. Canal Street. Contact person is Michael Guerrero at our street lighting shop (414) 286-5947 to coordinate pick up.

Install the concrete light pole base as specified in the plans. Install concrete light pole base so that the anchor rods are vertical to the horizon and bolt pattern is parallel to the curb face. The backside of concrete light pole base shall be a minimum of 2 inches above finished grade.

Plan changes must be approved by the City of Milwaukee Electric Services Supervisor or Street Lighting Engineering. The primary contacts are Mr. George Berdine, Street Lighting Manager (414) 286-5943 office, (414) 708-4245 mobile; or Mr. Denis Kozelek, Street Lighting Technician (414) 286-3252.

D Measurement

The department will measure Installing City-Furnished Concrete Light Pole Base as each individual light pole base, acceptably installed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.303	Installing City Furnished Concrete Light Pole Base	Each

Payment is full compensation for installation of the city-furnished concrete light pole base, and for transportation, excavating, backfilling, disposing of surplus materials, and incidentals necessary to complete the work.

43. Installing Conduit Into Existing Manhole, Item SPV.0060.304.

A Description

This special provision describes locating existing conduit system manholes and installing new 2.5" rigid PVC schedule 40 conduit into a manhole at the location shown on the plans. The contractor shall verify existing conduit manhole location with the City of Milwaukee, and shall maintain any existing conductors, fibers, and conduit paths without interruption or damage. Repair and restoration of all disturbed areas resulting from the work shall be according to the pertinent provisions of the standard specifications, and as hereinafter provided.

B Materials

2.5" rigid PVC schedule 40 conduit, as provided and paid for under other items in this contract. All materials shall conform to the pertinent provisions of the standard specifications unless otherwise noted.

C Construction

Carefully expose the outside of the existing structure without disturbing any existing conduits or cabling.

Drill the appropriate sized hole in a concrete structure or saw and remove full sections of block or bricks from the existing structure for the entering of conduit at a location within the structure that will not disturb the existing cabling and will not hinder the installation of new cabling within the installed conduit. This work may include the removal of the existing abandoned conduit from the structure to allow for the installation of the new conduits as indicated on the plans.

Fill any void area between the drilled hole and conduit with an engineer-approved filling material to protect against conduit movement and entry of fill material into the structure.

Carefully tamp backfill into place.

All disturbed areas shall be repaired and restored in kind.

D Measurement

The department will measure Installing Conduit Into Existing Item by each unit, acceptably installed. Up to six conduits entering a structure per entry point into the existing structure will be considered a single unit. Conduits in excess of six, or conduits entering at significantly different entry points into the existing manhole will constitute multiple units.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.304	Installing Conduit Into Existing Manhole	EACH

Payment is full compensation for drilling holes; removing blocks: removing bricks: removing abandoned conduit; furnishing and installing all materials, including bricks, and coarse aggregate; for excavation, bedding and backfilling, including any sand or other required materials; furnishing and placing topsoil, fertilizer, seed, and mulch in disturbed areas; for disposal of surplus materials; for making inspections; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

44. Adjusting TES Manhole Covers, Item SPV.0060.401.

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 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 Roney 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, 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 ¾-inch plywood cover or equal which is over the existing electrical cables in the manhole as mentioned above.

Notify Ms. Karen Roney 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 the unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.401	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; for removing, reinstalling and adjusting the covers; and for furnishing all labor, tools, equipment and incidentals necessary for adjusting each cover, complete according to the requirements of the plans and contract. 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.

45. Bearing Maintenance B-40-544, Item SPV.0060.501.

A Description

This special provision describes raising the girders, removing the existing bearings at the piers, furnishing and installing new bearing base plate shims, blast cleaning and painting the bearing components in the shop, replacing the anchor bolts as required, reassembling the bearings to provide full contact bearing for the existing fixed span girders, and for installing caulk around the perimeter of the bearings according to the plans and as hereafter provided.

B Materials

Furnish a complete epoxy coating system from the department's approved product list. The color of epoxy shall be white and the urethane coating material shall match the color for the finish coating material for all existing steel bearings shall be the same color and semi-gloss finish as provided under bid item Painting Epoxy System (B-40-544). Supply the engineer with the product data sheets before any coating is applied. The product data sheets shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, the minimum drying time for shop applied coats, and the recommended procedures for coating galvanized bolts, nuts, and washers.

Bearing base plate shims shall be stainless steel.

C Construction

C.1 General

Raise and support the existing steel girder and remove the bearing plate and existing shim pack. Leave the top plate as is, attached to the girder bottom flange. Keep and sandblast existing anchor bolts at the beam seat. Replace the bottom shim pack with new stainless steel full width shims. Blast-clean in the shop all bearing components while disassembled to a near white finish and paint all bearing components with one of the coating systems specified above. Install existing rehabilitated bottom bearing plate using existing anchor bolts and new nuts and washers, and reassemble the bearing assembly. As required, use adequate containment methods to contain material resulting from preparation of painted steel surfaces for painting. Remove existing nuts and washers by scoring the nuts and breaking them apart versus torquing off the nuts. Replace anchor bolts as required with new galvanized anchor bolts. Perform any concrete repairs required under the beam seats while the girder is temporarily supported for bearing maintenance.

C.2 Coating Application

Apply paint in the shop in a neat workmanlike manner, and according to the manufacturer's instructions and recommendations.

D Measurement

The department will measure Bearing Maintenance B-40-544 as each individual fixed span 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.0060.501	Bearing Maintenance B-40-544	EACH

Payment is full compensation for jacking up the girders; removing, cleaning, painting, installing new stainless steel shims; reinstalling bearings and replacing the anchor bolts as required; and for furnishing all labor, tools, equipment, materials, and incidentals necessary to complete the contract work.

46. Replacing High Strength Bolts, Item SPV.0060.502.

A Description

This special provision describes removing and replacing existing high strength bolts at locations shown in the plans. This special provision is applicable to the replacement of field splice bolts at bridge B-40-544.

B Materials

Furnish high strength bolts, nuts and washers that are according to the pertinent requirements of standard spec 506.2.5.

C Construction

Remove and replace high strength bolts, nuts and washers at the locations shown on the plans. Install according to the requirements of standard spec 506.3.12.3 for fully tensioned bolts.

Remove and replace the bolts 1 at a time, fully tensioning prior to removing the next bolt.

D Measurement

The department will measure Replacing High Strength Bolts B-40-544 as each individual bolt and accompanying washers and nut, acceptably removed and replaced.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.502	Replacing High Strength Bolts	EACH

Payment is full compensation for removing the existing bolts, nuts and washers; furnishing new bolts nuts and washers; installing the new bolts nuts and washers; and for furnishing all labor, tools, equipment, materials, and incidentals necessary to complete the work.

Payment for bolts at new connections or removed work is paid separately under the bid item "Bridge Structural Steel."

47. Junction Box 8x8x6-inch, Item SPV.0060.503.

A Description

This work shall be according to the requirements of standard spec 653, the plans, standard detail drawings, and as hereinafter provided.

B Materials

B.1 General

Furnish materials according to the plans and standard spec 653.2.2.

B.2 Junction Boxes

Furnish 8x8X6-Inch hot dipped zinc coated cast iron junction boxes with a checkered cover rated for vehicular loading. Provide Junction Box manufactured by OZ/Gedney, model #YT080806-CSV or equivalent.

C Construction

Perform construction according to the plans and standard spec 653.3.

D Measurement

The department will measure Junction Boxes 8x8x6-Inch as each individual junction box, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.503	Junction Box 8X8X6-Inch	EACH

Payment shall be full compensation according to standard spec 653.5.

48. Riverwalk Expansion Joint, Item SPV.0060.504; Riverwalk Expansion Joint With Cover Plate, Item SPV.0060.505.

A Description

This work shall consist of furnishing and installing the compressions seal expansion joint between the proposed new concrete bridge sidewalk and the adjacent existing riverwalk sections according to the plans, standard specifications, and special provisions. This work shall include furnishing and installing compression seals, joint plates, and joint supports as shown on the drawings.

Removal of the existing joint will be paid for under the bid item "Removing Old Structure Over Waterway with Minimal Debris Station 40+36.34."

B Materials

B.1 Joint Material

Preformed elastomeric compression joint sealer shall be according to standard spec 502.2.8. The installation of the compression joint sealer shall be according to standard spec 502.3.6.3.2.

B.2 Cover Plate

Furnish 3/16" thick hot dip galvanized perforated steel plate. Slip-resistant surface is to be applied to sidewalk cover plates by the manufacturer and then hot dipped galvanized to their recommendations to maintain the integrity of this surface.

Acceptable manufacturers of slip resistant surfaces include:

W.S. Molnar Company – Slipnot Grade 2, Steel
Ross Technology Corporation – Algrip, Steel
Or approved equal

C (Vacant)

D Measurement

The department will measure Riverwalk Expansion Joint and Riverwalk Expansion Joint With Cover Plate as each individual expansion joint, 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.0060.504	Riverwalk Expansion Joint	EACH
SPV.0060.505	Riverwalk Expansion Joint with Cover Plate	EACH

Payment is full compensation for furnishing, fabricating and installing riverwalk sidewalk expansion joints, including cover plates, in conformance with the plans and this special provision; and for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

49. Counterweight Ballast, Item SPV.0085.501.

A Description

This section describes furnishing, placing, adjusting and readjusting placing of the steel counterweight ballast until counterweight is satisfactorily balanced. The counterweights shall be constructed of painted steel plates or blocks. The amount of required counterweight shall be determined by the contractor from computations based on the approved shop details and as hereinafter specified.

B Materials

The structural steel for the ballast shall be as described in “Bridge Structural Steel”.

C Construction

Workmanship, sequence of construction and the balancing of the lift span shall conform to the AASHTO LRFD Specifications for Movable Highway Bridges.

Before placement of the counterweight begins, the contractor shall have approved counterweight balancing calculations.

Place the counterweight ballast corresponding to stages of erection of the lift span. Balancing calculations for these stages are to be given to the engineer for his approval. At all times the lift span is to be kept at a stage of balancing that enables the lift span to be lifted if not supported in the lifted position.

New Steel Balancing Blocks (approximately 85 lbs each), as detailed, in the plans shall be paid as part of this item. These blocks can be utilized as counterweight ballast.

Final balancing will require the movable lift span to be span heavy. See Bridge Hydraulic Section b.12.1 for additional information.

D Measurement

The department will measure Counterweight Ballast, 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
SPV.0085.501	Counterweight Ballast	LB

Payment is full compensation for furnishing and installing the painted steel counterweight ballast; and for furnishing all labor, material, equipment, tools, and incidentals necessary to perform the work as described herein and as shown on the plans.

50. Bridge Structural Steel, Item SPV.0085.502.

A Description

This section describes furnishing, fabricating, and erecting all new bridge structural steel on the lift span and approach spans. The work includes, but is not limited to fabrication and erection of stringers, channels, bracing, curb channels, railing connection elements, and incidentals such as fill plates and shim packs.

All work shall be according to the applicable requirements of standard spec 506 except as herein modified.

B Materials

B.1 Structural Steel

Use high strength structural steel conforming to ASTM A709, grade 50.

Any plate that is to be bent during fabrication shall be ordered from the mill such that the bend line will be oriented across the width of the plate. Bent plates to be hot-dip galvanized need to be according to ASTM A143.

Prior to painting, hot-dip galvanize, according to ASTM A123 or A153 as applicable, all new structural steel, including but not limited to stringers, channels, bracing, gusset plates, curb channels, sidewalk steel section, fill plates and shims, and other incidental steel.

Any and all zinc-coated areas that are damaged by welding, abrasion, or other causes shall be repaired according to ASTM A780, using either the Zinc-Based Solders or the Zinc-Rich Paints type of materials. The requirements of Annexes A1, REPAIR USING ZINC-BASED

ALLOYS, and/or A2, REPAIR USING ZINC-RICH PAINTS, shall be followed. Alternatively, damaged areas may be repaired as specified in standard spec 635.3.5.

B.2 Bolts and Fasteners

All high strength bolts shall meet FHWA requirements for rotational tests.

Use high strength, hot dip galvanized bolts conforming to ASTM A325. Submit the bolt specification and test report to the engineer according to the standard specifications.

B.3 Welding

The symbols on the plans indicate only the general type of weld required. Submit the proposed weld geometry to be used in fabrication to the engineer for approval. If a fillet weld size is not shown on the plans, size according to AASHTO/AWS requirements for minimum weld size based on material thickness.

Use the electric arc process for all welding. Field welding is not permitted except as specifically shown on the plans.

B.4 Painting

Paint all new structural steel according to Painting Epoxy System (B-40-544) and standard spec 517.

C Construction

C.1 General

Perform this work according to all applicable requirements of the standard specification in general, and Section 506 in particular, except as modified herein or as shown on the plans.

Standard spec 506.3 of the standard specification applies to this item.

Shims: Unless noted otherwise on the plans, wherever shims are called for on the plans, furnish material such that the total shim pack thickness can be adjusted in increments of 1/32-inch for machinery bases and structural parts that have machined surfaces, or 1/16-inch for structural steel connections for parts not having machined surfaces. The shims shall be galvanized or stainless steel.

Finishing: Finish any welded assembly that is to be finished after all welding is complete. Anywhere the terms “Fin,” “Finish,” or “Machined,” or the finish symbol (√) appear on the plans, it means that the surface and faying surface must be machined finished. Hand grinding is not permitted.

C.2 Field Erection of Lift Span

Erect the lift span in the open position to the maximum extent practical, so as not to interfere with navigation on the river.

The design of the structure assumes that the structural steel is completely erected before it is allowed to deflect under its dead load. Deflections incurred during various stages of erection are not considered. Therefore the actual erection methods and sequence employed by the contractor may have a substantial effect on the final steel profile. The contractor is responsible for taking all necessary compensatory action to ensure the final alignment and profile of the erected steel, including the grid deck, conforms to the plans. Any corrective work necessary to reposition previously erected steel to achieve acceptable alignment and profile must be approved by the engineer and is performed at no additional cost to the city.

C.3 Vertical and Horizontal Alignment of Lift Span

Survey lift span to verify squareness. In addition, jacking beam of the lift span must be parallel and the proper distance apart. The lifting girders must be in-line and parallel. Take measurements across the channel and back-check them by measuring the diagonal span dimensions. Submit measurements taken to verify squareness to the engineer for review prior to final installation.

The first time the lift span is slowly moved, make a check of all points of minimal clearance or possible interference between the fixed and movable parts of the structure, or as otherwise specified on the plans.

Take great care to assure that the stringers and channels on the lift span are erected the correct distance below the floor lines as shown on the plans, and that the floor grid units, which are supported on them, are at the proper elevation at all points.

Construction requirements pertaining to floor breaks are covered in the bid item for Lift Span Roadway and Sidewalk Joints.

Place the span in operating condition, to the satisfaction of the engineer, upon its final completion. Operate the span sufficiently for the engineer to inspect its operation to his satisfaction. Repair or replace faulty and/or defective work at no additional cost to the city and to the approval of the engineer.

C.4 Construction Details for Machinery Supports

Survey the machinery supports after erection to ensure that all elevations are as required by the specific machinery elements provided. The contractor is alerted that he must calculate all top of machinery support elevations based on information shown on the machinery plans and on the specific dimensions of the machinery parts that are provided for this project.

Top surface of all new supports shall be milled after fabrication to provide a uniform surface. All dimensions as required by AASHTO Section 2.5.17 "Fits and Surface Finishes," or as shown on the plans.

Weldments for machinery base supports shall be neat and shall have all exposed sharp corners and edges removed. Mounting surfaces of the frames shall be straight and flat such that full contact with the equipment being supported or retained is obtained.

All welding required herein or called for on the plans shall be done according to the requirements of AASHTO/AWS D1.5. Weldments shall be stress relieved by heat prior to final machining. The fitting up and welding procedure shall be such that distortion of the work will be a minimum. If necessary to obtain this result, suitable welding fixtures shall be used. The contractor shall submit welding procedures, together with the working drawings to the engineer for approval.

All fillet welds and partial penetration groove welds shall be tested by the magnetic-particle method according to the requirements of Section 6 of AASHTO/AWS D1.5. Radiographic testing shall be used for examination of complete joint penetration groove welds in butt joints and for complete penetration groove welds in T-joints. Corner joints shall be tested by ultrasonic testing. Submit copies of test reports to city.

All complete joint penetration welds shall be tested according to the requirements of Section 6 of AASHTO/AWS D1.5 for each size and type weld. Inspection and testing of welds and basis of acceptance shall be according to the requirements of Section 6 of AASHTO/AWS D1.5.

Field welding will not be permitted unless otherwise shown on the plans.

D Measurement

The department will measure Bridge Structural Steel by the pound acceptably completed. Only new structural steel will be measured for payment. Metal Plates for Bike Lanes will be measured and paid for separately. Painting of new structural steel will also be paid for separately. Galvanizing the new structural steel is included in this pay item.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0085.502	Bridge Structural Steel	LB

Payment is full compensation for furnishing, fabricating, and erecting all new bridge structural steel in conformance with the plans, standard specifications, and this special provision; for hot dip galvanizing all new lift span structural steel as specified; and for furnishing all labor, materials, tools, equipments, and incidentals necessary to complete the work. Cost of removing and reinstalling existing steel to access new work is incidental to this bid item.

Painting new structural steel is paid for under Painting Epoxy System (B-40-406).

The Metal Plates for Bike Lanes are not included in this item and paid for under Metal Plates for Bike Lanes.

51. Construction Staking Concrete Sidewalk, Item SPV.0090.01.

A Description

This special provision describes furnishing and setting construction stakes or control points, including all calculations required, necessary to establish the horizontal and vertical position of the concrete sidewalk as shown on the plans.

B (Vacant)

C Construction

C.1 General

Obtain or calculate benchmark data, grades, and alignment from data in the plan and verify with the engineer prior to beginning the work. The engineer will furnish horizontal alignment, horizontal alignment ties and control point data. This work shall include reestablishing the plan horizontal roadway alignment, alignment ties, and control points.

Obtain approval from the engineer prior to beginning the work for methods of survey and prior to beginning the work. The degree of accuracy used in the survey work shall be consistent with third order, class II. Establish additional benchmarks and control points as necessary or as directed by the engineer. Check plan dimensions, alignment, and elevations for accuracy with existing field conditions. Immediately call to the engineer's attention any errors and apparent discrepancies for correction or interpretation prior to proceeding with the work.

Maintain neat, orderly and complete survey notes and computations used in establishing the lines and grades. Make the survey notes and computations available to the engineer within 24 hours upon request as the work progresses.

C.2 Concrete Sidewalk

Place construction stakes for concrete sidewalk at intervals of 25 feet. A minimum of three stakes per cross section is required. Set and maintain as necessary additional stakes per cross section to achieve the required accuracy and to satisfy the contractors' method of operations. Set additional stakes as necessary to establish location and grade along intersecting road radii; and for auxiliary lanes, vertical curves, horizontal curves, and curve transitions. Locate all concrete sidewalk construction stakes to within 0.25 feet of the true horizontal position and establish the grade elevation to within 0.01 feet of the true vertical position.

D Measurement

The department will measure Construction Staking, Concrete Sidewalk by the linear foot along each roadway centerline or reference line. When sidewalk occurs on both sides of the roadway, the quantity of Construction Staking, Concrete Sidewalk, will be measured by the linear foot along the centerline or reference line of each side of the roadway.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.01	Construction Staking, Concrete Sidewalk	LF

Payment is full compensation for furnishing all survey work necessary to locate and set all concrete sidewalk construction stakes including additional stakes per cross section set to achieve the required accuracy and to satisfy the contractors' method of operations including intersecting road radii, auxiliary lanes, vertical curves, horizontal curves, and curve transitions; for resetting damaged or missing concrete sidewalk construction stakes; and for furnishing all labor, tools, stakes, lath, flags, equipment and incidentals necessary to complete the work.

52. Construction Staking, Upper Layer, Item SPV.0090.02.

A Description

This work shall consist of the construction survey work, including furnishing and setting of construction stakes, flags, or marking necessary to establish the profile and slope for the paving operations.

B (Vacant)

C Construction

Place construction stakes, flags, or markings at 25 foot intervals through all slope transition areas and at all structures for whatever distance required for slope and profile correction. Construction stakes, flags, or markings are required at both edges of each lane.

Set additional stakes as necessary to establish the profile and slope for structure approaches, auxiliary lanes, horizontal curves, and curve transitions according to the plan. The work shall include cross sectioning the existing pavement at 25 foot intervals, two locations per lane per interval as described above. The plotting of the cross sections and profiles determined by these cross sections should be the basis for computing the fills for the paving operations. Mark these fills on stakes or flags at a predetermined offset from the edge of pavement or with paint or paint keel on the existing pavement. Paint finish grades (fill) on the pavement at each station prior to paving. Calculate and mark finish grades for all manholes, including private utilities, on four sides before setting the manholes to the proper grade and slope. Obtain from the department, or calculate from data in the plan, benchmark data, grades, and alignment. Ensure that before beginning work, the methods of survey and staking are approved by the engineer. The degree of accuracy used in the survey work shall be consistent with third order, class II. The stakes or markings shall establish the grade elevations to within 3 mm (0.01 feet) of the true vertical position. Maintain neat, orderly, and complete survey notes and computations, and plotted profiles and cross sections. Make the survey notes, computations, and plots available to the engineer upon request as the work progresses and furnish to the engineer when the survey work has been completed.

D Measurement

The department will measure Construction Staking, Upper Layer in length by the linear foot to the nearest 25-foot interval measured along each roadway centerline; the measurement will use markings on both edges of the lane.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.02	Construction Staking, Upper Layer	LF

Payment is full compensation for all survey work necessary to locate and set all construction stakes including additional stakes per cross section set to achieve the required accuracy and to satisfy the contractors' method of operations including intersecting road radii, auxiliary lanes, vertical curves, horizontal curves, and curve transitions; for resetting damaged or missing construction stakes; and for furnishing all labor, tools, stakes, lath, flags, equipment and incidentals necessary to complete the work.

53. Marking Crosswalk Epoxy 12-Inch, Item SPV.0090.003; Marking Crosswalk Epoxy 24-Inch, Item SPV.0090.004; Marking Yield Line Epoxy 36-Inch, Item SPV.0090.005.

Install the pavement marking items in accordance with section 646 of the standard specifications and in accordance with the plan details.

54. Marking Line Preformed Plastic 4-Inch, Item SPV.0090.006; Marking Crosswalk Preformed Plastic 12-Inch, Item SPV.0090.007; Marking Line Preformed Plastic 24-Inch, Item SPV.0090.008; Marking Yield Line Preformed Plastic 36-Inch, Item SPV.0090.009.

A Description

This special provision describes furnishing and installing preformed plastic pavement marking as shown on the plans, in accordance with the standard spec 646 and as hereinafter provided.

B Materials

Furnish preformed pavement marking and sealant material, if required, from the department's 2017 approved products list. Furnish Preformed plastic pavement marking tape conforming to ITE standards. Deliver preformed marking materials to the project in manufacturer's containers legibly marked with the contents, color batch number, and manufacturer's name and address.

C Construction

Construct in accordance with standard spec 646 and the manufacturer's requirements. For quality assurance, provide the engineer and the region's Marking Section evidence of manufacturer training in the proper placement and installation of preformed pavement marking items.

D Measurement

The department will measure Preformed Plastic items 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.0090.006	Marking Line Preformed Plastic 4-Inch	LF
SPV.0090.007	Marking Crosswalk Preformed Plastic 12-Inch	LF
SPV.0090.008	Marking Line Preformed Plastic 24-Inch	LF
SPV.0090.009	Marking Yield Line Preformed Plastic 36-Inch	LF

Payment is full compensation for cleaning and preparing the pavement surface, furnishing and installing the material; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

55. Marine Dock Fender, Item SPV.0090.501.**A Description**

This section describes labor, material and equipment required for furnishing and placing the marine dock fender, including bolts, shims, and mounting hardware.

B Materials

Fenders shall be extruded and continuous in the length indicated. The fenders shall be black in color. The connecting hardware shall be fully exposed.

The elastomer shall be the ethylene propylene dimonomer (EPDM), as specified in ASTM D2000, with the following line callout:

3BA 720 A₁₄ B₁₃ C₁₂ F₁₉ Z₁, Z₂ and Z₃

Furnish zinc-coated steel nuts, bolts, and washers conforming to ASTM A307 and hotdip coated according to AASHTO M 232 Class C or mechanically coated according to AASHTO M 298 Class 50. Bolts shall be of the size and spacing required by the manufacturer's design and testing.

C (Vacant)**D Measurement**

The department will measure Marine Dock Fender, completed according to the contract and accepted, by the linear foot.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.501	Marine Dock Fender	LF

Payment is full compensation for removing the existing wood waler, furnishing and installing the rubber fender, furnishing and installing treated timber shims, for furnishing and installing all mounting hardware, and for furnishing all equipment, tools, labor and incidentals necessary to complete the work according to the contract.

56. 2 Line Aluminum Railing B-40-544, Item SPV.0090.502.

A Description

This special provision describes fabricating, painting and installing railing according to standard spec 506, 513 and 517 and the plan details, as directed by the engineer, and as hereinafter provided.

B Materials

All materials for railing shall be new stock, free from defects impairing strength, durability and appearance. Railing posts shall be aluminum alloy permanent casting conforming to AASHTO designation M193 (ASTM B108, Alloy A444). Rails and splice sleeves shall be ASTM B221, Alloy 6061-T6.

All hardware for rail to post connections, and for anchor bolts in concrete and at steel connections shall be stainless steel.

B.1 Shop Drawings

Submit shop drawings showing the details of railing construction. Show the railing height post spacing, rail location, weld sizes and locations and all dimensions necessary for the construction of the railing. Show location of shop rail splices, field erection joints and expansion joints. State the name of the paint manufacturer and the product name of the tie coat and top coat used along with the color. State the size and material type used for all components. Also show the size and location of any vent or drainage holes provided.

C Construction

C.1 Delivery, Storage and Handling

Deliver material to the site in an undamaged condition. Upon receipt at the job site, all materials shall be thoroughly inspected to ensure that no damage occurred during shipping or handling and conditions of materials is in conformance with these specifications. If coating is damaged, contractor shall repair or replace railing assemblies to the approval of the engineer at no additional cost to the owner. Carefully store the material off the ground to ensure proper ventilation and drainage. Exercise care so as not to damage the coated surface during railing installation. No field welding, field cutting or drilling will be permitted without the approval of the engineer.

C.2 Touch-up and Repair

For minor damage caused by shipping, handling or installation to coated surfaces, touch-up the surface in conformance with the manufacturer's recommendations. If damage is excessive, the railing assembly shall be replaced at no additional cost to the owner. The

contractor shall provide the engineer with a copy of the manufacturer's recommended repair procedure and materials before repairing damaged coatings.

D Measurement

The department will measure 2 Line Aluminum Railing B-40-544 as a single lump sum unit for each structure where railing is satisfactorily furnished and installed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.502	2 Line Aluminum Railing B-40-544	LF

Payment is full compensation for fabricating, transporting, and installing the railing, including any touch-up and repairs; and for furnishing all labor, tools, equipment, materials and incidentals necessary to satisfactorily complete the work.

57. Remove, Repair, Paint, and Reinstall Existing Tubular Railing, Item SPV.0090.503.

A Description

This special provision describes the removing, transporting, repairing, cleaning, painting and reinstalling of the existing steel bridge railing on the lift span as well as approach spans of the bridge. The railing repairs will be minor steel repairs at areas of steel section loss. Supplying, fabricating, installing and painting the new steel elements of any nature for railing repairs is included in this bid item.

It is advised to conduct an inspection of this railing prior to submitting a bid to determine the full extent of repairs required.

B Materials

Use steel conforming to ASTM A709 Grade 36 for all new material except as noted herein or on the plans. Do not hot-dip galvanize the repaired railing.

Use A325 hot-dip galvanized bolts for all new bolted connections.

The shop drawings for the original Wells Street Lift Bridge are available at the City of Milwaukee Department of Public Works for the contractor's use. However, it is the contractor's responsibility to field verify locations of bolt holes that are to be re-used and other dimensions relevant to repairing and reinstalling the existing steel railing.

C Construction

Prior to removing the railing, conduct a field inspection of the railing with the engineer. Document, with the concurrence of the engineer, damaged or deteriorated sections, elements and components of the railing. Replace or repair any damaged or deteriorated part of railing

elements and base plates found and documented during this inspection that has holes or more than 15% section loss.

Take all necessary care and precautions to ensure that the railing is not damaged during removal and reattachment. Once removal has started, the contractor is responsible for any damage to any components of the railing. It is the contractor's responsibility to repair or replace any damaged steel to the satisfaction of the engineer and at no additional expense to the city.

Transport the railing to a place where it can be safely cleaned, repaired and painted.

If, during cleaning, painting, and repair of the railing, either the engineer or the contractor identifies sections, elements or components of the railing that were not identified during the original field inspection as requiring repair or replacement, but that, in the opinion of the engineer, should be repaired or replaced, the repair or replacement of these elements will be required. Make such repairs or replacements at no additional cost to the department.

Remove all old paint, clean and paint the entire bridge railing according to Structure Repainting Recycled Abrasive B-40-544. Applicable parts of standard spec 506.3 of the standard specification apply to this bid item.

D Measurement

The department will measure Remove, Repair, Paint, and Reinstall Existing Tubular Railing 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.0090.503	Remove, Repair, Paint, and Reinstall Existing Tubular Railing	LF

Payment is full compensation for conducting a field inspection of the railing prior to removal; removing, repairing, and fabricating the deteriorated part of the railing and base plates, including furnishing, fabricating and reattaching the replacement elements; for making repairs and replacements identified during the process that were not identified during the initial field inspection; reattachment of the tubular railing as shown on the plans and as described herein; for cleaning and painting of the entire bridge railing including the repaired portion of the rail; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work. Replacement of all contractor-damaged parts will not be measured for payment.

58. 1-Inch Fiberglass Reinforced Epoxy (FRE) Conduit, Item SPV.0090.504.

A Description

This section describes furnishing and installing a 1-inch diameter, Fiberglass Reinforced Epoxy (FRE) conduit to the underside of the deck of Structure B-40-544 as shown on the plans.

B Materials

Use material conforming to the class of material named and as specified. Conduit shall be non-metallic, filament-wound epoxy, suitable for direct burial, concrete encasement, and suspended from bridge members without regard to outdoor ambient light. The product shall contain carbon black to provide ultraviolet protection.

The conduit shall have an interference joint system consisting of an integral bell and spigot with interlocking male and female threads. Epoxy adhesive shall be applied on joints per manufacturer's specifications prior to use.

Product shall be listed by Underwriters Laboratories and conform to the National Electrical Code.

The ID dimension shall be full, actual trade size.

All adaptors, couplings, expansion joints and suspended hangers shall be FRE fittings corresponding to and manufactured for use with FRE conduit as specified on the plans.

C Construction

Construct according to the pertinent provisions of standard spec 502 and 652 and specifications provided by the City of Milwaukee, Articles 207, 208, 209, 210 and 211.

The conduit package to be installed on B-40-544 consists of one 1-inch duct.

Remove existing galvanized pipe suspended below the bridge. Install a fiberglass to galvanized pipe fitting on the end of the galvanized pipe protruding through the abutment wall.

Coupling of the fiberglass duct sections shall be accomplished and secured by first applying epoxy adhesive then mating a spigot end into an integral bell end with a blow to the open end of the duct section.

Install all FRE duct and components according to the manufacturer's instructions.

D Measurement

The item 1-Inch Fiberglass Reinforced Epoxy (FRE) Conduit, furnished and installed at the locations on the plans, will be measured by the linear foot acceptably installed. 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.0090.504	1-Inch Fiberglass Reinforced Epoxy (FRE) Conduit	LF

Payment is full compensation for removing the galvanized pipe, furnishing and installing the fiberglass conduit, and for furnishing all labor, equipment, tools and incidentals necessary to complete the work according to the contract. Duct and associated fittings rendered unfit for use by the contractor through the contractor's operations shall be replaced by the contractor in kind at the contractor's own cost and expense.

59. Rectangular Rapid Flashing Beacon System, Item SPV.0105.201.

A Description

This special provision describes furnishing and installing an AC powered and hardwired Rectangular Rapid Flashing Beacon (RRFB) system in accordance to section 651 of the standard specifications, as directed by the engineer, and as hereinafter provided.

B Materials

B.1 General Requirements

Conform the RRFB to all applicable FHWA and MUTCD standards and guidelines, and meet or exceed the requirements specified in FHWA Memorandum IA-11, *Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons*, and all FHWA Official Interpretations for IA-11.

Furnish a crosswalk assembly with one light bar or with two light bars mounted back-to-back. See plans for whether assemblies require one light bar or two light bars. Provide three LED light arrays with each light bar: two rapidly and alternately flashing rectangular amber (vehicle) indications and one amber side-mounted (pedestrian) indication. Operate the system with one controller with remote hardwired light bars and pushbuttons. Provide a system capable of future operation with wireless communication between the push buttons, controller, and light bars.

Activate the RRFB system utilizing ADA compliant pedestrian push buttons that are hardwired. Synchronize the activation and deactivation of all indications.

B.2 Equipment Requirements

Furnish a complete RRFB system with single or multiple light bar assemblies. Each assembly shall consist of, but is not limited to, controller and electrical components (including wiring and solid-state circuit boards), and LED indications in a light bar. Include the following items:

- System
 - Operate the system on AC power from an electrical service with an applicable circuit breaker and with lightning suppression.
 - When activated, all indications associated with a given crosswalk shall simultaneously commence operation within 120 msec, and shall cease operation at a predetermined time (programmable timeout). The time shall reset after any pedestrian actuation.
 - The duration of the flash cycle (timeout) shall be programmable from a minimum of 5 second to 60 minutes, in increments of seconds.
 - Individual components shall be independently replaceable, equipped with approved terminal strips or wire-end molded connectors.
- RRFB Controller
 - Solid-state, digital controller capable of operating the RRFB as specified.
 - Capable of storing input count data in preset intervals, with downloadable capabilities.
 - Replaceable independently of other components.
 - Completely programmable, including but not limited to, flash pattern and duration.
 - An on-board user interface that provides system diagnostics and allows system setting changes.
- Enclosure
 - A NEMA Type 3R aluminum enclosure intended for indoor or outdoor use, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, hose-directed water and damage from ice formation.
 - Of sufficient size to house all equipment furnished under this special provision and for future equipment for wireless operation.
 - Constructed from type 5052-H32 aluminum with a minimum thickness of 0.080".
 - Vented to promote airflow for internal components. All vents and drains shall include screening to deter insects and foreign matter.
 - Include a replaceable #2 Corbin traffic lock and keys.
 - Utilize tamper-resistant stainless continuous steel hinges.
 - Include a removable control panel to which all control circuit components mount.
 - Utilize stainless steel mounting studs to accommodate bracket options.
- Power Supply
 - Powered by 120 VAC to 12 VDC.
 - The input voltage ranges from 120 to 240 volts.
 - Of sufficient size to power all equipment installed with this special provision and any future wireless communication.

- Light Housing and Indications
 - A black colored light bar housing constructed of durable, corrosion-resistant powder-coated aluminum with stainless steel fasteners.
 - Enclosed components shall be modular in design whereby any component can be easily replaced using common hand tools, without having to remove the housing from the pole.
 - All mounting hardware required for mounting the light bar housing shall be provided and universal to multiple poles.
 - Yellow indications of a minimum size of approximately 5" wide x 2" high.
 - A pedestrian LED indication shall be side-mounted in the light bar housing: assembly to be mounted so it is directed toward, and visible to, pedestrians in the crosswalk.
 - The outside edges of the two indications, including any housing, shall not protrude beyond the outside edges of the integral signage of the assembly.
 - The light intensity of the yellow indications shall meet the minimum specifications of the Society of Automotive engineers (SAE) standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January 2005 for Class 1 peak luminous intensity (candelas).
- Sign
 - All signs are to be supplied and installed under separate bid items. Construct RRFB assemblies to allow the appropriate space for the installation of the signs in the field as shown in the plans.
- Hardware
 - Furnish all hardware, connections, and other miscellaneous items to make the RRFB system fully operational.
- The following items are to be supplied and installed under a separate bid item:
 - Pushbutton
 - Pedestal Pole
 - Traffic Signal Standard
 - Concrete Base

B.3 Warranty

Provide a minimum of a three-year manufacturer warranty from the date of activation and acceptance by the engineer. Provide service information to the purchaser, consisting of at least parts manuals and operational/maintenance manuals.

C Construction

The RRFB system consists of multiple assemblies to be constructed by the contractor as shown on the plans. Assemble RRFB with pedestrian activation per the manufacturer's recommendations. Mount the controller cabinet, signage, light bar, and push buttons to the traffic signal standards as shown on the plans and per the manufacturer's requirements.

Mount the Pedestrian Indication LEDs to be visible to pedestrians in the crosswalk, and to flash concurrently with the vehicle indications to confirm that the RRFB is in operation.

Program the controller and make the RRFB system fully operational. The city will provide the flash operation timings. Instruct the city in programming and operation of the controller.

Install wires to new RRFB assemblies through conduit paid under separate bid item. Power supply will be from connections at the bridge operators house. Coordinate with the bridge electrical contractor to make all necessary connections and pull all required wire to connect to the bridge power source. This may include multiple conduits and existing cable crossing the lift bridge portion of the bridge to feed power to the western and eastern locations. This item includes all necessary electrical work.

D Measurement

The department will measure Rectangular Rapid Flashing Beacon System as a single lump sum unit of work for each location, acceptably completed.

E Payment

The department will pay for the measured quantity at the contract unit price under the following bid item.

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.201	Rectangular Rapid Flashing Beacon System	LS

Payment is full compensation for furnishing and installing a fully operational RRFB system including wire and all necessary mounting hardware and appurtenances; and for shop drawings, manuals, and warranty.

60. Bridge Machinery – General.

A Description

A.1 General

This section describes the General Requirements for the detailed work to be completed on the following bridge machinery components and systems: Counterweight Machinery, Equalizer Machinery, Hydraulic Machinery, Span Guides, and Bumper Beams.

The cost of work in Bridge Machinery - General is included in the Bridge Machinery bid items.

A.2 Machinery Design Criteria

The design of any new operating machinery conforms to the 2007 LRFD Movable Bridge Design Specifications 2nd Edition of the American Association of State Highway Transportation Officials (AASHTO), with Interim Revisions through 2017, except as otherwise provided herein or shown in the plans. Should any inconsistency exist between this specification and the plans the plans shall govern.

A.3 Manufacturer's Product Data

Submit manufacturer's data and/or shop drawings for all manufactured and purchased products.

The data for manufactured parts and assemblies shall include, as applicable: the manufacturer's name and trade name; descriptive literature, catalog cuts, drawings, diagrams and certified prints and lay out dimensions; catalog model number, nameplate data, size and capacity, plus commercial, federal and military specification references; and any other relevant data required to establish contract compliance.

A.4 Shop Drawings

Detail and accurately dimension all parts on the shop drawings. Show limits of accuracy and tolerance required for machining, surface finishes and allowances for fits. Give journal and associated bearing tolerances so that prescribed limits are obtained. Unless otherwise called for the fits and finishes shall apply according to ANSI B46.1 and ANSI B4.1 for both cylindrical and non-cylindrical parts.

Show proprietary parts in outline on the drawings. Furnish complete dimensions and data to enable a determination of the adequacy of the unit. Furnish certified dimensional prints stating the name, part and job number. Give pertinent load and speed ratings; provisions for lubricating, draining and determining the level of lubricant, the method of lubrication, location and type of fittings and the inspection openings, seals and vents. If a product is modified in any way from the description submitted by its original manufacturer, provide a drawing that details the modifications and assigns a special part number to that part to avoid supply of replacement parts not similarly modified.

Provide a diagram or assembly drawing sufficient to enable disassembly and reassembly of the component. Identify and describe on the assembly drawing, or diagram, each internal part and show dimensions of principal parts; certified external dimensions; gross weight and normal operating ratings.

Provide shop bills of material, listing all parts by number and quantity. Provide the materials and specifications for each part. Where standard specifications are used, give the designating numbers.

The following abbreviations may be used:

American Association of State Highway Transportation Officials	AASHTO
American Gear Manufacturers Association	AGMA
American Iron and Steel Institute	AISI
American National Standard Institute	ANSI
American Society of Mechanical Engineers	ASME
ASTM International	ASTM
American Welding Society	AWS
National Electrical Manufacturers Association	NEMA
National Lubricating Grease Institute	NLGI

Occupational Safety and Health Act
Society of Automotive Engineers
Steel Structures Painting Council
State of Wisconsin Standard Specifications for Highway and Structure Construction -
Standard Specifications

OSHA
SAE
SSPC

Furnish assembly and erection drawings with identifying marks and essential dimensions for locating parts and assemblies. The use of opposite hand or mirror image erection drawings is not acceptable. It is the contractor's responsibility to achieve satisfactory construction and operation of the machinery; approval of shop drawings by the engineer does not constitute relief from this provision.

Show subtitles describing the parts and the inspection agency on each shop drawing.

Submit shop drawings to the engineer for review and approval by the date agreed upon during the pre-construction meeting. Resubmit drawings rejected or requiring correction until they are approved. Any damages or costs that result from ordering materials or performance of any work before receiving shop drawing approval shall be the responsibility of the contractor. The required number of copies of approved shop drawings will be determined at the pre-construction meeting.

A.5 Operation and Maintenance Manuals

A.5.1 General Requirements

Furnish manuals containing complete descriptive literature, catalog cuts, reduced size shop drawings and other information required for successful operation and maintenance for the span operating and stabilizing machinery systems of the bridge. Provide revisions, if required, after the start-up period by means of addenda to the manuals.

Clearly print all materials so that the submittals, drawings, catalog cuts and all other information is legible, accurate and distinct. Reduced size drawings and illustrations must be legible so that dimensions and lettering are readable. Fold all contents to the page size for inclusion in the manuals.

Print the material on durable mediums. Use water resistant inks. Use printing methods that offer permanence and durability.

A.5.2 Contents

Neatly inscribe the following information on the manual's cover: Title: "Operating and Maintenance Manual;" the name and location of the bridge; the contract number, date, and the names of the consulting engineer and the contractor.

Include the following in the manual:

- Index of contents and tabbed dividers for each section.
- A system layout showing all machinery components, including all existing components reused.
- A detailed description of the control system and procedure for operating the bridge using the main drive motors, auxiliary drive motors and any manual means.
- Reduced size copies (11" x 17") of shop drawings and lubrication charts.
- Certified parts drawings and descriptions of proprietary units.
- A detailed description of the function of each principal component.
- Manufacturer's standard literature and instructions for installation, operation, lubrication, adjustment and maintenance for each component and assembly.
- A list of the names, addresses and telephone numbers of all subcontractors and manufacturers furnishing and installing the equipment and systems together with the a record of the local representatives for the equipment and systems installed.
- Recommended procedures and frequency for cursory and detailed inspections of the equipment.
- Information on trouble-shooting problems that may be encountered during operation for each of the major pieces of equipment. Include things to look for, signs of irregular operation and suggested solutions.

A.5.3 Materials for Manuals

Bind the maintenance and operating materials in heavy duty, three hole binders, of either ring or post type, as directed by the engineer. Use binders that have nickel-plated, metal hinges and a locking mechanism that permits the sheets to lie flat, such as a channel lock. Use heavy duty, stiff covers that are moisture, oil and grease resistant such as plastic or other suitable materials.

Bind all the printed material between the rigid covers of the book. Provide a book measuring approximately 9 x 12 inches. Provide included drawings in black outline on white background. Use archival quality, acid free, punched, 60 pound, 8-1/2 x 11 inch, loose leaf paper. Use paper pages, foldout drawings, diagrams and illustrations having three standard spaced holes, 5/16 inch minimum diameter, with plastic or cloth reinforcement.

A.5.4 Manual Submittals

Submit to the engineer for approval the arrangement of the books, proposed methods of binding, printing and reproduction and materials to be included. Two copies of sample formats and outlines of the contents in draft form are required ninety (90) days before the earliest of: final inspection, acceptance tests or return of the span operation to the City of Milwaukee, Department of Public Works.

Submit 2 copies of the complete manual in final form 30 days prior to final inspection, acceptance tests or return of the span operation to the City of Milwaukee, Department of Public Works.

Submit 6 copies of the approved manual 10 days after final inspection and acceptance tests. One of the six copies shall become the property of the engineer of record; the remaining copies shall become the property of the City of Milwaukee, Department of Public Works.

A.6 Operating Instructions

Provide operating instructions, approved by the engineer, for each system and principal piece of equipment for the use of operation and maintenance personnel. Post on or adjacent to the piece of equipment the printed operating instruction, including proper adjustment, operation, lubrication, safety precautions, procedures to be followed in event of equipment failure and other items of instruction recommended by the manufacturer. Use either weather-resistant materials or protect the instructions with suitable enclosures. Prepare diagrams showing the complete layout of the operating machinery and span lock systems. Frame the diagrams, under glass or in an approved laminated plastic, and post where directed by the engineer. Securely fasten all posted instructions and diagrams to prevent easy removal. Do not locate in the direct sunlight.

A.7 Quality Assurance

A.7.1 Standard Products

In so far as practical, use materials and equipment that are the standard, catalogued products of manufacturers regularly engaged in the production of such products; and that are the latest standard design; and that comply with the requirements of the contract documents. Provide materials and equipment that essentially duplicate units which have served satisfactorily for at least two years prior to bid opening. Where two units of the same category equipment are required in the system they shall be the products of the same manufacturer; although, components of the system need not be the products of one manufacturer.

Provide each major component with a name plate, securely affixed in a conspicuous place, with the manufacturer's name and address, the model and serial number. The nameplate of the distributing agent is not acceptable.

A.7.2 Manufacturer's Recommendations

Install and align all units and components as recommended by the manufacturer of that product. Furnish printed copies of those instructions and procedures to the engineer before beginning installation. Failure to furnish these instructions may be cause for rejection. Preparation of the mounting surfaces and associated components required for the installation is included in the work.

A.7.3 Codes and Standards

Furnish all machinery bid items in compliance with the applicable requirements of the latest standards and codes of, but not limited to, those organizations designated in Clause A.4. Where other codes and standards are designated in these special provisions they shall also apply to the work requirements of the parts and equipment with which they are associated.

A.7.4 Qualification, Personnel and Facilities

Complete all fabrication, cleaning, lubrication, testing and all other work required for bridge machinery pay items using an adequate number of experienced mechanics and service

personnel who are thoroughly trained and familiar with the required methods specified for correct completion of the work.

For the installation, alignment and fastening of the bridge operating machinery and span lock systems, use an adequate number of trained and skilled millwrights having past experience in the installation of machinery on at least two previous movable bridges.

Equip the mechanics, millwrights and service personnel with the necessary instruments, tools and other equipment necessary to assure the related components have been furnished within acceptable tolerances; and to make any adjustments required to attain correct installation and satisfactory operation.

A.7.5 Rules, Regulations and Ordinances

Assure that all work complies with all applicable federal, state and local rules, regulations and ordinances.

In the event of a conflict between these special provisions and the federal, state and local codes, standards, rules, regulations and ordinances the most stringent requirement applies.

A.7.6 Measurements and Verification

Dimensions given on the plans are nominal and intended for guidance only. Note any variations from nominal dimensions on the shop drawings.

It is the contractor's responsibility to verify all field dimensions contained in the plans and special provisions. By incorporating the field dimensions contained in the plans and special provisions into the shop drawings, the contractor is acknowledging that he has verified their accuracy.

A.7.7 Substitutions

The specification of a manufacturer's name and part number is for the purpose of defining quality, configuration, rating and arrangement of parts. Equivalent products of another manufacturer may be substituted for the specified item upon the written approval of the engineer. Make any changes necessary, as a result of the substitution, in related machinery, structural and electrical parts at no additional cost to the department.

Obtain the engineer's written approval for a substitute product prior to ordering it. Acceptance of the substitute product is at the sole discretion of the engineer. The basis for acceptability of a substitute product will be a review of the descriptive material and detail submitted and evaluation of its ability to fulfill the contract requirements.

The engineer will stamp submittals for substituted materials. Resubmit rejected shop drawings showing the specified product. Rejection shall in no way result in extra cost. Approval of a substitute product by the engineer does not relieve the contractor of the responsibility for proper operation, performance or functioning of that product.

Inform the engineer if departures from the contract documents are deemed necessary. Submit full details of the departures and reasons for the need, as soon as possible, to the engineer for approval. Do not proceed with any departure without written approval.

B Materials

B.1 Castings

Castings shall be true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blow holes, and other defects in positions affecting their strength and value for the service intended. All castings shall be sandblasted or otherwise effectively cleaned of scale and sand, to present a smooth, clean, and uniform surface. All unfinished edges of castings shall be neatly cast with rounded corners, and all inside angles shall have ample fillets. All surfaces requiring finish shall have adequate material allowance for machining to finish dimensions. All surfaces of castings in contact with other metal shall be finished to 125 microinches as measured under ANSI B46.1, unless a finer finish is specified by the Plans. Where castings are machined, the thickness of the metal after finishing shall not be less than the thickness shown on the Plans. Machined bosses shall be provided to give proper seats for bolt heads and nuts.

Blow holes appearing upon finished castings shall not have a depth injuriously affecting the strength of the casting. Minor defects, which do not impair the strength may, with the approval of the engineer, be welded by an approved process and be inspected by magnetic particle examination. The defects shall be removed to solid metal by chipping, drilling, or other satisfactory method, and, after welding, the castings shall be annealed, if required by the engineer. Castings, which have been welded without the engineer's permission, will be rejected.

Perform visual surface examinations per ASTM A802 criteria for Level II and requirements of MSS SP-55 for every steel casting. Perform liquid-penetrant exams according to ASTM E165, or magnetic particle examination according to ASTM E709 on every casting to detect surface and near-surface flaws. Perform ultrasonic inspection on every casting according to ASTM A609 that meets the requirements of Level 2 (Procedure A) or Level 3 (Procedure B) for castings with cross sections in both directions thicker than 4 1/2 inches. Meet the requirements of Level 1 (Procedure A) or Level 1 (Procedure B) for thinner castings. Reject steel castings that do not meet all of the above examination criteria. Reject castings that have been welded without the engineer's approval.

B.2 Forgings

All forged shafts shall be reduced to size from a single bloom or ingot until perfect homogeneity is secured. The blooms or ingots, from which shafts are to be made, shall have a cross-sectional area at least three times that required after finishing. No forging shall be done at less than a red-heat. Forged rounds for shafts shall be true, straight, and free from all injurious flaws, seams, or cracks. Forgings shall provide adequate material allowance for machining to finish dimensions.

Perform magnetic particle examination per the requirements of ASTM A668 Supplementary 6. Submit all test results to the engineer.

B.3 Supports

Provide new supports and brackets that meet the requirements of ASTM A36. Stress relieve supports after welding. Hot-dip galvanize and paint supports with pre-approved 2 coat system. Discuss with galvanizer methods to minimize distortion from galvanizing. Incorporate methods on shop drawings and implement methods.

B.4 Shafting and Pins

All shafts shall be accurately finished, round, smooth, and straight; and when turned to different diameters, they shall have rounded fillets at shoulders and chamfers at shaft ends. All journal-bearing areas on shafts and pins shall be accurately turned, ground, and polished with no trace of tool marks or scratches on the journal surface or adjoining shoulder fillets. Journal diameters shall be finished to the limits specified in AASHTO Specifications.

Provide shafts of forged steel meeting the requirements of ASTM A668. Hot rolled steel of equivalent strength and ductility may be substituted for shafting with a finished diameter of 4 inches or less. Cold finished shafts and pins will not be permitted. Provide ANSI Standard B4.1 FN2 fit at hub locations. Machine finish each shaft over its entire length to obtain a smooth finish concentric with the bearing centerline. All shafts with holes shall be shipped with pipe plugs at each end prior to final assembly.

B.5 Fasteners

Subdrill all holes for connecting machinery parts to the supporting steel at least 1/32 inch smaller in diameter than the finish diameter, unless otherwise specified. Line ream at assembly with the mating part for proper fit after the parts are correctly aligned.

Positive locks shall be furnished for all nuts. If double nuts are used, they shall be of standard thickness. Double nuts shall be used for all connections requiring occasional opening or adjustment. If lock washers are used for securing screws or nuts, they shall be made of tempered steel and shall conform to the SAE regular dimensions. The material shall meet the SAE tests for temper and toughness.

Beveled washers shall be used where bearing faces have a slope of more than 1:20 with respect to a plane normal to the bolt axis.

Provide fasteners manufactured in the United States correctly marked on top of the head with identification of the property, class and source.

Clean all contacting surfaces of machinery elements and structural steel to be bolted together according to the standard specifications before bolting.

All threads for bolts, nuts, and cap screws shall conform to the coarse thread series and shall have a Class 2 tolerance for bolts and nuts or Class 2A tolerance for bolts and Class 2B tolerance for nuts according to the ANSI B1.1, "Unified Screw Threads."

All bolt heads and nuts shall bear on seats square with the axis of the bolt. On castings, except where recessed, the bearing shall be on finished bosses or spot-faced seats. Bolt heads, which are recessed in castings, shall be square. All bolt holes through unfinished surfaces shall be spot-faced for the head and nut, square with the axis of the bolts.

B.5.1 Turned Bolts

Turned bolts shall conform to the requirements of ASTM Specifications A449. Turned bolts shall have the diameter of the shank 1/16-inch larger than the diameter of the threads. Hexagonal heads and nuts shall be according to the heavy series according to ANSI B18.2.1 and shall be finished. Two nuts or one nut and a lock-washer shall be used on turned bolts. Lock washers will only be permitted if approved by the engineer. Holes for turned bolts shall be carefully reamed to provide for an ANSI B4.1 LC6 fit with the body of the bolt.

B.5.2 High Strength Bolts (Machinery Connection to supports)

High strength bolts shall be used for connection of machinery components to the machinery bases wherever turned bolts are not required by the plans or Special Provisions. Machinery connection bolts, nuts, and hardened washers shall conform to the requirements of ASTM Specifications A449, A563, and F436, respectively. Holes for machinery connection bolts shall be 1/32 inch larger than the diameter of the bolt. All high strength bolts, nuts, and washers shall be galvanized with a Class 50 mechanically deposited zinc coating according to the requirements of ASTM B695.

B.5.3 Anchor Bolts

Anchor Bolts - Anchor bolts fastening new machinery supports to concrete shall be Hilti HVA Capsule Adhesive Anchors with HAS-SS threaded rods manufactured of AISI 304 or 316 stainless steel. Nuts shall conform to the requirements of ASTM Specification F594. Washers shall be stainless steel. Double nuts shall be used on all anchor bolts.

Socket Head Screws

The dimensions of socket-head cap screws, socket flat-head cap screws, and socket-set screws shall conform to ANSI B18.3; and the screws shall be made of heat-treated alloy steel, cadmium-plated and furnished with a self-locking nylon pellet embedded in the threaded section. Unless otherwise called for on the plans or specified herein, set screws shall be of the headless, safety type; shall have threads of the coarse thread series; and shall have cut points. Set screws shall neither be used to transmit torque nor as the fastening or stop for any equipment that contributes to the stability or operation of the bridges.

B.5.4 Wire Ropes and Sockets

Wire rope and sockets shall conform to the requirements of 6.8.3.3 of the AASHTO Specifications and the following. Every possible effort shall be made to fabricate wire ropes of uniform physical properties and all similar ropes shall be cut from a minimum number of reels.

All wire ropes shall be pre-stretched by the manufacturer. A stripe shall be painted on one side of all ropes to facilitate correct alignment of the rope during field installation.

A minimum of two samples from each reel shall be tested to destruction to determine the actual breaking strength of the wire rope.

B.6.1 Counterweight Ropes

Counterweight ropes shall be of the diameter shown on the contract documents, preformed, drawn galvanized, of 6 x 19 classification, 6 x 25 filler wire construction, with independent wire rope core fabricated from extra improved plow steel wire. Counterweight ropes shall have a minimum breaking strength of 159,800 lbs.

B.6.2 Equalizer Ropes

Equalizer ropes shall be of the diameter shown on the contract documents, preformed, drawn galvanized, of 6 x 19 classification, 6 x 25 filler wire construction, with independent wire rope core fabricated from extra improved plow steel wire. Equalizer ropes shall have a minimum breaking strength of 58,800 lbs.

B.6.3 Bumper Beam Ropes

Bumper Beam counterweight ropes shall be of the diameter shown on the contract documents, preformed, drawn galvanized, of 6 x 19 classification, 6 x 25 filler wire construction, with independent wire rope core fabricated from extra improved plow steel wire. Bumper Beam counterweight ropes shall have a minimum breaking strength of 26,600 lbs.

B.6.4 Rope Sockets

Rope sockets shall be as specified on the contract documents. During testing of wire rope assemblies per AASHTO 6.8.3.3.6, socket performance shall be as specified in AASHTO 6.8.3.3.7.

B.7 Keys and Keyways

All keys shall conform to the requirements as specified in the contract documents. Keys and keyways shall be provided between sheaves, drums, or rollers and their respective shafts. Unless specified otherwise, keys and keyways shall conform to the dimensions and tolerances for parallel keys of ANSI B17.1 with fit and finish as specified in AASHTO for keys and keyways. For connections requiring one key, as indicated on the Plans or recommended by component manufacturer, the side fit between key and keyway shall conform to ANSI B4.1 FN2 fit, and the top and bottom fit shall conform to ANSI B4.1 LC4 fit. For connections requiring two keys, as indicated on the Plans or recommended by component manufacturer, key and keyway fit shall conform to ANSI B17.1 Class 2 fit. All keys and keyways shall have key chamfer and keyway radius as suggested by ANSI B17.1, regardless of fit. All keys and keyways shall be finished to 63 microinches as measured under ANSI B46.1. Keyways shall not extend into any bearing.

Furnish keys that are machined from carbon steel forgings, ASTM A668, Class D, unless otherwise specified in the contract documents.

B.8 Bearings and Bushings

Select anti-friction bearings to provide for an AFBMA rated B-10 life of 40,000 hours for the load conditions specified in the contract documents. Use pillow block bearings, adapter mounted, self-aligning, fixed or expansion versions as required, and locate units as designated on the plans. Use cast steel housings capable of withstanding the design loads in any direction, including radial up-lift. Secure the cap with high strength, steel bolts. Cast the mounting bases without bolt holes. Mounting holes may be sub-drilled in the shop and then final drilled and reamed with the supporting structures, after alignment, at assembly in the field. Units shall be grease lubricated and have provision for re-lubrication through fittings in the housings. Provide shaft seals, mounted in the housings, capable of retaining the lubricant and preventing the entry of water and foreign materials.

Provide bronze bushing halves, of ASTM B22 Alloy as shown in the plans. Finish machine the outside diameters of the bushings to provide an ANSI Class LC-1 fit with their associated housing bores. Provide sufficient stock in the bushing inside diameter to permit final machining of the bore after assembly in their housings with the full liners in place. Polish bushing bores to a surface texture of 16 microinches according to ANSI B46.1

B.9 Shims

Where shown on the Plans and required for leveling and alignment of equipment, shim packs shall be furnished, and shall be capable of height adjustment from 0 inches to twice the nominal shim pack dimension in 1/64 inch increments. For example: each 1/2 inch nominal shim pack shall include one 1/2", one 1/4", one 1/8", one 1/16", one 1/32", and two 1/64" plates. In the case where fine adjustment is required to secure proper alignment of components, thinner shims (0.001" to 0.015") shall be used.

Machinery shims shall be neatly trimmed to the dimensions of the assembled parts and drilled for all bolts that pass through the shims. Holes for bolts shall be oversized by 1/16-inch. Shims shall be shown and fully dimensioned as details on the working drawings. Shims with open side or U-shaped holes for bolts will not be permitted. No shims shall have less than two holes for bolts.

Shims shall conform to the requirements of ASTM A36, except that thicknesses less than 1/4-inch shall be stainless steel, conforming to the requirements of ASTM A480 or ASTM A240.

B.10 Epoxy Grout and Sealant for Supports on Concrete Surfaces.

Apply a pre-approved epoxy grout for level contact under all brackets and supports mounted to concrete surfaces. Seal joint with pre-approved sealant.

B.11 Welding

Perform all welding required or designated in the plans in conformance with the appropriate American Welding Society Specifications. Ultrasonically inspect all welds used to fabricate machinery per AWS D1.5 for compression welds. Stress relieving will be required. Keep distortion of the pieces to a minimum by use of welding fixtures or other approved devices, fixtures and procedures. Perform required machining after welding and stress relieving.

Field welding of completed structures and machinery assemblies or components will not be permitted without the approval of the engineer.

Show complete details of welding joint sizes on the shop drawings. Submit written welding procedure specifications and welder performance qualification records.

B.12 Lubrication

Standardization of the lubrication for the mechanical and electrical systems is required, including but not limited to all bearings and wire ropes. The contractor shall coordinate with all the system suppliers to ensure that the type of lubricant supplied shall be kept to as few as possible.

B.12.1 Lubrication Fittings

Provide all bearings and other grease lubricated machinery components with ¼ PTF lubrication fittings with ball check.

Locate the fittings to conveniently facilitate lubrication. Connect the lubrication ports to central stations using 1/4 inch stainless steel, seamless pipe with stainless steel fittings. Use pipe extensions that are as short as possible and securely supported.

Upon completion of fabrication plug all grease fitting locations until the components are installed and regular lubrication is started. Immediately after erection and prior to operation lubricate all rotating and sliding parts.

Provide removable hinged or bolted covers in order to access lubrication fittings and other routine maintenance devices that might be covered by machinery guards.

B.12.2 Lubrication Charts

The contractor shall furnish three copies on mylar full size (22 inches by 34 inches) as well as reduced ½ sized for inclusion in the operating and maintenance manuals. The lubrication chart shall show the location of all lubrication fittings and other points of lubrication for the new and existing mechanical and electrical equipment, which will require lubrication of any kind. The chart shall show the kind of lubricant to be used at each point and the frequency of lubrication. A full size print of the chart shall be framed under Lexan in a neat wooden frame with backing and shall be placed as directed by the engineer within the control house.

Lubrication chart shall be submitted to the engineer for review and approval as a working drawing in accordance to this special provision. Final lubrication chart shall not be made until the chart has been approved by the engineer.

C Construction

C.1 Shop Fabrication

Give the engineer no less than ten working days' notice before beginning work at foundries, forge and machine shops so that inspections and tests may be arranged. Provide the engineer the names and locations of casting, forging and machining suppliers; sub-contractors and

other suppliers; and furnish copies of orders that have been placed, prior to the start of any work.

Allow the inspector, designated by the engineer, free access and facilities for inspection of materials and workmanship in foundries, forge and machine shops. Such inspections are to facilitate work and avoid errors, but it is understood the contractor is not relieved of the obligation of assuring compliance with the plans and specifications or the necessity of replacing defective materials and workmanship. Any work performed while free access has been refused will be automatically rejected.

The inspector shall have full authority to reject materials or workmanship which does not fulfill the requirements of these special provisions.

Perform all testing and furnish test specimens, certified copies of chemical and physical tests and certificates of compliance to the engineer without additional charge. Initial acceptance of material and finished parts and assemblies will not preclude subsequent rejection if found deficient. Correction of the deficiencies and/or replacement of materials shall be the responsibility of the contractor. Any materials, components or assemblies rejected after receipt at the bridge site shall be removed and replaced without additional cost to the department.

C.2 Shop Inspection and Testing

Completely assemble all machinery components to assure they fit as required. Perform critical measurements to confirm conformance with the shop detail and assembly drawings.

C.3 Defective Materials and Workmanship

Remove and replace, without additional cost to the department, components determined defective and not made acceptable during inspection and testing. No claims for additional compensation due to delays resulting from defective materials and/or components will be recognized.

Correct, without additional cost to the department, defects resulting from faulty materials, workmanship, components or installation errors that are revealed during the warranty period. If corrections are not made in a timely manner the department will make the necessary corrections and charge the costs to the contractor.

C.4 Shipment and Storage

C.4.1 Protection for Shipment

Clean all machinery components and assemblies of dirt, grit, chips, corrosion and other injurious substances before shipment. Coat unpainted surfaces with an approved corrosion-inhibiting preservative.

Grease exposed shaft journals, wrap in oil-resistant paper, cover with oil-soaked burlap and securely timber lag for shipment. Take all precautions to assure the bearing surfaces are not damaged during shipping and handling.

Completely protect machinery parts from weather, dirt and foreign materials during shipment. Store machinery parts indoors while awaiting installation and erection at the site. Mount assembled units on skids or otherwise crate or protect during handling and shipping.

Bag and/or crate for shipment all mounting hardware and other small parts. Do not commingle the parts. Identify each part with its number and keep separate from other parts. Provide tags recording the part number wired to the containers for each part prior to shipment. Coat bolts, nuts and other steel parts with approved rust-inhibitor.

C.4.2 Package and Deliver Spare Parts

Prepare spare parts for long term storage as recommended by the manufacturer. Wrap and box in a durable wooden container labeled with the bridge name. Tag all individual spares with clear identification using the part number, bridge name and description as shown on the approved shop drawings. Clearly and permanently mark the outside of the spare parts boxes, identifying the contents of the box.

C.4.3 Guarantees and Warranties

The contractor will assign to the city all manufacturers' warranties and guarantees covering products, components and assemblies purchased by the contractor and used in fulfillment of this contract. The terms of those warranties and guarantees are to be consistent with the customary practices of the manufacturer in commercial trade upon acceptance of the contract.

The contractor shall warrant satisfactory service operation of the mechanical systems, components and associated equipment for a period of 60 months following the date of final acceptance of the project. Manufacturer's standard warranties shall be extended to cover this period at no additional cost to the department.

C.5 Erection

C.2.1 General

Erection and adjustment of machinery shall be by millwrights or experienced machinists with demonstrated skill in this type of work

C.5.2 Alignment and Bolting.

Erect and assemble the machinery according to part number and match marks, and according to manufacturers' recommendations. Adjust all parts for precise alignment and orientation by means of shims. Pull tightly against supporting members by use of clamps, temporary bolts, or other approved means before drilling and reaming holes for connecting fasteners. Tapered shims may be used, if required, and shall be furnished at no additional cost to the department.

Turned bolt holes into structural steel for attaching machinery components shall, generally, be drilled from the solid after final alignment of the machinery. During erection a sufficient number of 1/4 inch undersized, subdrilled holes are permissible for the use of undersize, temporary bolts. When final alignment is achieved, drill and ream the remaining bolt holes

and install full size bolts. Remove the temporary bolts, ream the undersize holes and install full size bolts.

In locations where existing bolt holes in the bearings and structures are to be reamed to accept a larger diameter turned bolt, use some of those holes for temporary bolting to achieve alignment. When properly aligned, ream the unused holes to full size, install the full size bolts; remove the temporary bolts, ream the holes and install full size bolts.

Accuracy of the reamed holes through the machinery component, shims and structural steel is required to maintain correct alignment of the machinery. Use a structural steel reaming jig, affixed to the drill and secured to the work piece to prevent the reamer from deviating and assure a cylindrical hole throughout its length. Check holes with a bolt hole micrometer.

Torque all high strength bolts, and turned bolts as recommended by the equipment manufacturer.

C.5.3 Coatings

Coat threads for all turned bolts with anti-seize compound before assembly to avoid corrosion or galling and ease future removal.

C.6 Painting

C.6.1 General

Clean and paint all unfinished surfaces of machinery and equipment as required by the department using a system listed on the department's master list of preapproved zinc rich three coat paint systems. Submit an outline of painting materials and methods with the shop drawings. Coat according to standard spec 517 and the requirements herein.

Paint items designated in the contract plans to be hot dipped galvanized and painted with the preapproved 2 coat system. Apply all prime and final paint coats in the shop.

C.6.2 Shop Painting

Before painting unfinished surfaces in the shop, remove all burrs, chips, rust, scale, sand, grease and other foreign material by blasting, wire brushing or other approved means. Prepare surface for painting by blasting to achieve a SSPC-SP-10 "Near White Metal Blast Cleaning".

Use masking to avoid painting machinery surfaces which are in normal rubbing contact, such as shaft journals and bushings, and sliding guides.

After properly cleaning the surfaces apply one prime coat of shop paint to all unfinished machinery surfaces. Use a primer compatible with the paints selected for subsequent coats.

C.6.3 Faying Surfaces

All finished contact surfaces which are not finally assembled in the shop shall be coated with waterproof National Lubricating Grease Institute No. 3 Multipurpose grease as soon as possible after being accepted and before removal from the shop, and shall be adequately

protected during shipment by wrapping with burlap or canvas held by wooden bats securely wired together. During erection these surfaces shall be thoroughly cleaned and a field coat of grease applied prior to assembly.

C.6.4 Field Painting

After erection and installation is completed, clean and paint all remaining non-rubbing, exposed machinery surfaces with an intermediate, weather resistant free coat.

Upon completion of all operation and acceptance tests and after removing all accumulated grease, oil, dirt and other material, apply a final finish coat.

C.7 Contractor's Inspection

Upon completion of the machinery installation, make a thorough inspection to confirm that all machinery components are free of obstructions and properly aligned; all bolts tightened in accord with standard spec 506; all field painting is complete; bearings and other rotating and sliding parts are supplied with lubricants; and the lift span is balanced as required.

The engineer shall accompany the contractor during his final inspection to determine if the bridge is ready for field testing.

C.8 Field Testing

When the bridge is ready for field testing, notify the engineer no less than 15 days before scheduling the tests. Inform all city and department personnel designated by the engineer about the tests. Provide a complete crew of machinists to be available during conduct of the tests to operate the lift span and make all adjustments and corrections required to complete the tests.

Submit a testing procedure to the engineer for approval prior to the tests. Coordinate all mechanical equipment testing with tests required for electrical equipment.

The testing procedure shall include, but not be limited to, the verification of proper installation, alignment, fastening, adjustment and operation of the following:

1. Hydraulic Machinery
2. Counterweight Machinery
3. Equalizer Machinery
4. Span Guides
5. Bumper Beams

The tests shall include operation of the span under normal and auxiliary drive conditions.

During the test runs, observe and inspect all machinery assemblies to determine if everything is in proper running order and fully meets the requirements of the contract documents, special provisions and the manufacturer's performance standards. The engineer and representatives of the machinery and electrical control manufacturers shall be present and

witness all field testing. Temperature rises in mechanical and electrical equipment shall not exceed design and/or manufacturer's limits.

If testing shows that components are defective, inadequate, functioning improperly or incorrectly adjusted, make all corrections, adjustments, repairs or replacements necessary before final acceptance at no additional cost to the department.

C.9 Training

Provide instruction for the department's Operation and Maintenance personnel. The instruction shall include classroom presentations and discussions, utilizing materials in the Operation and Maintenance Manuals, as well as observations of the equipment in place on the lift span, while stationary as well as in operation. Facilities for training will be provided by the department.

The topics covered during the training shall include, but not be limited to:

1. Function and purpose of the major components and systems
2. Normal and auxiliary operation
3. Routine maintenance, adjustments, and lubrication
4. Trouble shooting

D (Vacant)

E Payment

No payment is associated with Bridge Machinery – General. The cost of work required by Bridge Machinery-General is included in the bridge machinery bid items.

61. Bumper Beams, Item SPV.0105.501.

A Description

Under this item, remove bumper beams, bumper beam counterweight sheave assemblies, bumper beam counterweights, rods, rod brackets, and transverse roller guide assemblies, recondition bumper beam replacing roller assembly bearings and modifying bumper brackets, recondition sheave assemblies replacing sheave shaft and bushings and modifying brackets, recondition counterweight adding weight, and replace cables, cable hardware, and rod guide bronze plates. Install, adjust, paint, lubricate, align, test and place in satisfactory operation the Bumper Beam system at each pier.

The bumper beam system consists of the following major components:

<u>MK</u>	<u>Item</u>	<u>Total</u>	<u>New</u>	<u>Refurbish</u>
BB-1	Bumper Beam	2		X
-	Bumper Beam Sheave Assembly	8		X
C-4	Bumper Beam Counterweight Cable	8	X	
-	Lower Rod Bracket	4		X
BB-2	Bumper Bracket - modification	4	X	
-	1 1/2" diameter stainless steel rod	4		X

BP-1	Bronze Plate – Rod Guide	4	X	
BP-2	Bronze Plate – Bumper Bracket Plate	4	X	
-	Bumper Beam Counterweight Assembly	2		X
GA-1	Roller Guide Assembly – transverse	4		X
GA-2	Roller Guide Assembly – longitudinal	4		X
B-4	Bumper Beam Roller Bearing	64	X	
-	Bumper Beam Roller Assembly	32		X

Bumper Beam Sheave Assembly: (4) with Sheave Bracket SB-1, (4) with Sheave Bracket SB-2

(Quantities are per assembly)

<u>MK</u>	<u>Item</u>	<u>Total</u>	<u>New</u>	<u>Refurbish</u>
SB-1 or SB-2	Bumper Beam Sheave Bracket	1		X
S-4	Bumper Beam Sheave Shaft	1	X	
SX-4	Bumper Beam Sheave	1		X
B-2	Bumper Beam Sheave Bushing	1	X	
TB-6	Bumper Beam Thrust Bearing	2		X

B Materials

B.1 General

Materials used to fabricate the new bumper beam components and lubrication charts shall be as shown on the contract documents, and according to the requirements specified in Bridge Machinery - General provisions. Fabricate new bumper beam sheave shaft from material meeting the requirements of ASTM A668 Class G. Fabricate new sheave bushings conforming to the requirements of ASTM B22 C91300. Fabricate new bumper beam thrust bearings conforming to the requirements of ASTM B438-CT-100-K26.

B.2 New Roller Bearings

Replace the 64 existing ball bearing roller bearings with part No FC225K1-14S by Link Belt or equivalent.

C. Construction

C.1 Removal of Equipment

Remove the bumper beam machinery with utmost care, since the majority of it will be reused. Disposal of the machinery components not reused shall be accomplished in accord with existing local, state and federal regulations. All HAZMATS (Oils, greases, etc.) shall be handled as required by the appropriate EPA regulations.

C.2 Recondition Bumper Beam

After disconnecting bumper beam counterweight and cables, remove bumper beams from bridge. Remove all roller assemblies and roller bearings. Remove all corrosion from bumper beams and inspect for section loss. At the discretion of the engineer, repair damaged locations by welding a ¼" plate of the affected area. Paint bumper beam with approved paint system, and apply 16" alternating diagonal stripes of red and white.

Remove grease, girt, and corrosion from roller assemblies and refasten rollers with new roller bearings, locating the rollers as specified on the Plans.

C.3 Recondition Rod Brackets and Guides

The existing rod brackets bolted near the bottom of the lift legs are to be refurbished and reused. Remove the rod brackets, remove grease and corrosion, and repaint. Reinstall support brackets with new galvanized high strength bolts, nuts and washers.

Replace Bronze Plate – Rod Guide secured to the bottom of the bumper beam at the rod penetration of the bumper beam. After removing the existing bronze plate, remove corrosion from bumper beam and clean female threads. Fasten new bronze plate (BP-1) with new 3/8" dia flat head countersunk cap screws.

C.4 Recondition Bumper Brackets

After removing corrosion from the existing bumper brackets, trim existing bumper bracket plates and secure new Bumper Bracket modification (BB-2) to existing bumper bracket plates as shown on the Plans. Attach Bronze Plate – Bumper Bracket Plate (BP-2) and adjust to obtain specified clearance with the structure after reinstallation of bumper beams

C.5 Recondition Bumper Beam Sheaves Assemblies

All bumper beam sheave assemblies are to be reused and refurbished. Remove sheave brackets leaving anchor bolts in place. Clean anchor bolts for reuse. Disassemble the sheave assemblies and remove grease, dirt, and corrosion from each component part. Modify the existing sheave brackets as shown on the Plans. Remove existing sheave bushings from sheaves and replace with new ensuring specified fits with refurbished sheaves and new shafts. Paint sheaves and brackets prior to reassembly. Shop assemble sheave assemblies and ship to bridge site assembled.

C.6 Recondition Counterweight Assemblies

The two counterweight assemblies are to be refurbished and reused. Reuse the existing counterweights. After cleaning the existing eight 5'-0" x 4" x 6" steel slabs in each bumper beam counterweight, add an additional 6" of 5'-0" x 4" steel slab to each counterweight and secure together with new eye bolts and plate washers. Fasten new bumper beam counterweight cables and adjust for equal length at each counterweight.

C.7 Recondition Roller Guide Assemblies

Recondition the Roller Guide Assemblies (GA-2) near the center of the bumper beam in place. After removal of bumper beam, clean grease, dirt, and corrosion from roller guide assemblies and anchors, and paint

Remove the Roller Guide Assemblies (GA-1) near the ends of the bumper beam and remove all grease, dirt, and corrosion. After painting reinstall with existing base anchors and new nuts and washers. Temporarily adjust the alignment of the roller guide assemblies at the upper connection to the approach sidewalk. Secure final alignment of the roller guide assemblies only after operation has been demonstrated to be smooth with no evidence of excessive friction.

C.8 Lubrication Chart

Furnish and install lubrication charts as described in Bridge Machinery – General provisions covering all lubrication requirements of the Bumper Beams.

D Measurement

The department will measure Bumper Beams 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.0105.501	Bumper Beams	LS

Payment is full compensation for furnishing all materials, labor, tools and equipment necessary to remove, refurbish, reinstall, test, lubricate, paint and perform all incidental work to achieve a complete and acceptable installation of the bumper beams.

Submit to the engineer for evaluation a full and complete breakdown of all costs under this item. The engineer has full authority to revise the breakdown, to suit his/her judgment, and make the various tasks more in conformity with the adjudged true values. The contractor agrees the detailed breakdown shall not be effective until it has been approved by the engineer.

Progress billing payments will be based upon the approved breakdown. Progress payments for Bumper Beams shall be made according to the department's standard payment practices and in the following manner:

- Upon completion and acceptance by the department of all shop detail drawings, the contractor will be paid 5% of the item bid price.
- Upon completion and acceptance by the department of shop fabrication, shop inspection, shop testing, delivery and storage of materials, the contractor will be paid 35% of the item bid price
- Upon completion and acceptance by the department of the Bumper Beam installation, alignment, bolting and protection of materials, the contractor will be paid 20% of the item bid price.
- Upon completion and acceptance by the department of the Bumper Beam inspection and field testing the contractor will be paid 30% of the item bid price.
- Upon completion of training and receipt and acceptance by the department of approved Operating and Maintenance Manuals the contractor will be paid the remaining 10% of the item bid price.

62. Counterweight Machinery, Item SPV.0105.502.

A Description

Under this item, remove the counterweight cables, shafts, sheaves, and lower cable brackets, recondition the existing counterweight sheaves, shafts, and cable brackets, and replace the thrust bearings, counterweight cables, and cable hardware. Adjust, paint, lubricate, align, test and place in satisfactory operation the Counterweight Machinery in each pier.

The counterweight machinery consists of the following major components:

<u>MK</u>	<u>Item</u>	<u>Total</u>	<u>New</u>	<u>Refurbish</u>
SX-1	Counterweight Sheave	4		X
S-1	Counterweight Shaft	4		X
TB-1	Counterweight Shaft Thrust Bearing	8	X	
C-1	Counterweight Cable (long)	8	X	
C-2	Counterweight Cable (short)	8	X	
CB-1	Lower Counterweight Cable Bracket	4		X
CB-2	Upper Counterweight Cable Bracket	4		X
P-1	Counterweight Cable Pin – long	4	X	
P-2	Counterweight Cable Pin – short	4	X	

B Materials

B.1 General

Materials used to fabricate the new counterweight machinery components and lubrication charts shall be as shown on the contract documents, and according to the requirements specified in Bridge Machinery - General provisions.

Fabricate new thrust bearings conforming to the requirements of ASTM B438-CT-100-K26. Fabricate new Counterweight Cable Pins conforming to the requirements of ASTM A668 Class G.

C Construction

C.1 Removal of Equipment

Remove the counterweight machinery with utmost care, since a majority of it will be reused. Disposal of the machinery components not reused shall be accomplished in accord with existing local, state and federal regulations. All HAZMATS (Oils, greases, etc.) shall be handled as required by the appropriate EPA regulations.

C.2 Magnetic Particle Inspection of Existing Counterweight Shafts

Have an independent testing agency experienced in NDT techniques inspect the shafts for cracks and defects. Inspect the four counterweight shafts to the requirements of ASTM A275 "Magnetic Particle Examination of Steel Forgings". Prepare a test report with recommendations and submit to the engineer for information. Perform this inspection early in the project schedule to allow procurement of new counterweight shafts, if required as a result of the testing, in a timely manner so as not to compromise the project schedule.

C.3 Recondition Counterweight Sheaves and Shafts

The four counterweight sheave and shaft assemblies are to be reused and refurbished without removing sheave from shaft. Remove grease and corrosion and repaint. Protect journals during blasting. Polish the shaft journals, removing no more than 8 thousandths of an inch from the diameter of the journal. Measure, record, and submit final diameter measurements of journals

C.4 Recondition Counterweight Cable Brackets

The four counterweight cable brackets (CB-1) mounted to the lift legs are to be reused and refurbished. Remove brackets from the structure and remove grease and corrosion, and repaint. Reattach brackets to structure using existing holes, with new 3/4" diameter galvanized fasteners.

The four counterweight cable brackets (CB-2) embedded in the counterweight concrete are to be reused and refurbished. With bracket in place, remove grease and corrosion, and repaint.

C.5 Install and Align Counterweight Shafts

Install refurbished Counterweight Shafts and Sheaves in existing Counterweight Bearings with new Counterweight Shaft Thrust Bearings. Position each Counterweight Bearing such that the lower bushing is level to within 0.003" per foot. Install each Counterweight Shaft such that both journals of each shaft are level to within 0.003" per foot. Make adjustments with full size shims below Counterweight Bearings. Finger shims are not acceptable. Any locations that currently have finger shims installed shall be replaced with full size shims. Full size shims with open slotted holes are acceptable, provided the area of the shim is at least 85% the area of the bearing base. If necessary to obtain acceptable alignment, provide and install full size tapered shims.

C.6 Install, Adjust and Lubricate Counterweight Cables

Provide and install counterweight cables. Measure and record the period or frequency of each cable when vibrated in the fundamental harmonic frequency and calculate rope tension. Adjust cable tension by tightening or loosening nuts on threaded cable socket until the calculated tension based on measured fundamental frequencies of all cables at each corner, deviate 5% or less of the average corner tension value. Operate lift span 10 times and measure, record, and adjust the cable tension if necessary. Repeat until measurements are consistent and within specified tolerance. Prior to tensioning counterweight cables, submit to the engineer for approval the method of measuring rope frequency with details of all equipment and instruments to be used. Submit final rope tension measurements for approval. Lubricate all counterweight cables with a field dressing recommended by the rope manufacturer.

C.7 Lubrication Chart

Furnish and install lubrication charts as described in Bridge Machinery – General provisions covering all lubrication requirements of the Counterweight Machinery.

D Measurement

The department will measure Counterweight Machinery 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.0105.502	Counterweight Machinery	LS

Payment is full compensation for furnishing all materials, labor, tools and equipment necessary to manufacture, assemble, install, erect, test, lubricate, paint and perform all incidental work to achieve a complete and acceptable installation.

Submit to the engineer for evaluation a full and complete breakdown of all costs under this item. The engineer has full authority to revise the breakdown, to suit his/her judgment, and make the various tasks more in conformity with the adjudged true values. The contractor agrees the detailed breakdown shall not be effective until it has been approved by the engineer.

Progress billing payments will be based upon the approved breakdown. Progress payments for Counterweight Machinery shall be made according to the department's standard payment practices and in the following manner:

- Upon completion and acceptance by the department of all shop detail drawings, the contractor will be paid 5% of the item bid price.
- Upon completion and acceptance by the department of shop fabrication, shop inspection, shop testing, delivery and storage of materials, the contractor will be paid 35% of the item bid price
- Upon completion and acceptance by the department of the Counterweight Machinery installation, alignment, bolting and protection of materials, the contractor will be paid 20% of the item bid price.
- Upon completion and acceptance by the department of the Counterweight Machinery inspection and field testing the contractor will be paid 30% of the item bid price.
- Upon completion of training and receipt and acceptance by the department of approved Operating and Maintenance Manuals the contractor will be paid the remaining 10% of the item bid price.

63. Equalizer Machinery, Item SPV.0105.503.

A Description

Under this item, remove the equalizer cables, equalizer sheave assemblies, cable guide assemblies, and cable covers, recondition the existing equalizer sheave assemblies replacing sheave bushings, fabricate new spring retainers, and replace all cables, cable hardware,

springs, cable guide bushings, and equalizer cable covers. Adjust, paint, lubricate, test and place in satisfactory operation the Equalizer Machinery.

The equalizer machinery consists of the following major components:

Equalizer Machinery

<u>MK</u>	<u>Item</u>	<u>Total</u>	<u>New</u>	<u>Refurbish</u>
-	Upper Equalizer Sheave Assembly	8		X
-	Lower Equalizer Sheave Assembly	4		X
C-3	Equalizer Cable	8	X	
GB-1	Cable Guide Bushing	32	X	
CB-3	Equalizer Cable Bracket	4		X
SP-1	Compression Spring	8	X	
SP-2	Spring Retainer	4	X	
TR-1	Threaded Rod	8	X	
-	Turnbuckle	8	X	
-	Cable Covers	20	X	

The Equalizer Sheave Assemblies consist of the following major components:

Upper Equalizer Sheave Assembly (Quantities are per assembly)

<u>MK</u>	<u>Item</u>	<u>Total</u>	<u>New</u>	<u>Refurbish</u>
	Upper Equalizer Sheave Bracket	2		X
S-2	Upper Equalizer Shaft	1		X
SX-2	Upper Equalizer Sheave	2		X
B-1	Equalizer Sheave Bushing	2	X	
TB-3	Thrust Bearing	2		X
TB-4	Thrust Bearing	1		X
-	3 1/4" Dia Jam Nut	4	2	2
-	1/4" x 1/4" Key	2		X

Lower Equalizer Sheave Assembly (Quantities are per assembly)

<u>MK</u>	<u>Item</u>	<u>Total</u>	<u>New</u>	<u>Refurbish</u>
-	Lower Equalizer Sheave Bracket	1		X
S-3	Lower Equalizer Shaft	1		X
SX-3	Lower Equalizer Sheave	2		X
B-1	Equalizer Sheave Bushing	2	X	
TB-2	Thrust Bearing	2		X
TB-4	Thrust Bearing	1		X
W-1	7 1/2" Dia Washer	1		X
-	4 3/4" Dia Jam Nut	2		X

B Materials

B.1 General

Materials used to fabricate the new equalizer machinery components and lubrication charts shall be as shown on the contract documents, and according to the requirements specified in Bridge Machinery - General provisions.

All machinery shall be attached with new galvanized fasteners according to the requirements specified in Bridge Machinery – General, unless specified otherwise.

B.2 Replacement Sheave Bushings

Fabricate new Equalizer Sheave Bushings conforming to the requirements of ASTM B22 C91300.

B.3 Cable Covers

Fabricate equalizer cable protective covers from 6" ABS Schedule 40 Cellular Core Pipe and DWV Fitting System that meets the requirements of ASTM D 3965. Paint cable covers the same color as the lift span steel. Pipe shall be iron pipe size (IPS) conforming to ASTM F628. Fittings shall conform to ASTM D 2661. Hangers for pipes shall be clevis hangers sized for a 6 inch pipe and be suspended by a 5/8" stainless steel rod attached to a galvanized steel beam clamp. Clevis hangers shall be manufactured of 304 stainless steel.

B.4 Cable Guide Bushings

Fabricate cable guide bushing plates from oil-impregnated bronze conforming to the requirements of ASTM B438 CT-1000-K26.

C Construction

C.1 Removal of Equipment

Remove the equalizer machinery with utmost care, since a majority of it will be reused. Removal of existing cable guide roller assemblies shall be done without causing damage to girder webs. Disposal of the machinery components not reused shall be accomplished in accord with existing local, state and federal regulations. All HAZMATS (Oils, greases, etc.) shall be handled as required by the appropriate EPA regulations

C.2 Recondition Equalizer Sheaves Assemblies

All equalizer sheave assemblies are to be reused and refurbished. Prior to removal from the structure, each sheave assembly shall be uniquely labeled so they can be reassembled and reinstalled in the same location from where it was removed. Care must be taken to assure the correct labeling is retained for each component during the cleaning process. Disassemble the sheave assemblies and remove grease, dirt, and corrosion from each component part. Polish journals and chase threads on equalizer shafts. Remove existing sheave bushings and replace with new ensuring specified fits with refurbished sheaves and shafts. Paint sheaves and brackets prior to reassembly. Shop assemble sheave assemblies to secure specified fits and ship to bridge site assembled.

C.3 Equalizer Cable Brackets

Refurbish existing cable bracket (CB-3) in place. After removal of equalizer cables clean grease, dirt, and corrosion from bracket and anchors and paint.

C.4 Cable Guide Bushing

Install new cable guide bushing plates at each location where the equalizer cables pass through a girder. Install one cable guide bushing plate on each side of the girder web as shown on the Plans.

C.5 Cable Installation

Route cables through girders and around sheaves as shown on the Plans. Attach ends of equalizer cables to cable brackets with cable hardware, and tighten such that the spring retainer is in contact with bracket (RB-1) and the nuts on the cable sockets at the spring retainer are snug tight. Adjust hardware such that turnbuckles, threaded rods, and threaded cable sockets have allowance for future adjustment. Operate the lift span at least 2 times, adjust cable tension as necessary in open and closed condition. Continue adjustment until cable tensions are unchanging.

C.6 Equalizer Cable Covers

Cables that pass through the girders shall be protected by pipes mounted on closet flanges attached to the girders. Pipes and closet flanges shall be cut in half longitudinally and aligned over the equalizer cables. Additional support shall be supplied by clevis hangers, rods, and beam clamps. Holes drilled in supporting structure shall be touched-up after drilling and prior to assembly by using a zinc rich paint.

C.7 Lubrication Chart

Furnish and install lubrication charts as described in Bridge Machinery – General provisions covering all lubrication requirements of the Equalizer Machinery.

D Measurement

The department will measure Equalizer Machinery, completed according to the contract and accepted, as a single lump sum 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
SPV.0105.503	Equalizer Machinery	LS

Payment is full compensation for furnishing all materials, labor, tools and equipment necessary to manufacture, assemble, install, erect, test, lubricate, paint and perform all incidental work to achieve a complete and acceptable installation.

Submit to the engineer for evaluation a full and complete breakdown of all costs under this item. The engineer has full authority to revise the breakdown, to suit his/her judgment, and make the various tasks more in conformity with the adjudged true values. The contractor

agrees the detailed breakdown shall not be effective until it has been approved by the engineer.

Progress billing payments will be based upon the approved breakdown. Progress payments for Equalizer Machinery shall be made according to the department's standard payment practices and in the following manner:

- Upon completion and acceptance by the department of all shop detail drawings, the contractor will be paid 5% of the item bid price.
- Upon completion and acceptance by the department of shop fabrication, shop inspection, shop testing, delivery and storage of materials, the contractor will be paid 35% of the item bid price
- Upon completion and acceptance by the department of the Equalizer Machinery installation, alignment, bolting and protection of materials, the contractor will be paid 20% of the item bid price.
- Upon completion and acceptance by the department of the Equalizer Machinery inspection and field testing the contractor will be paid 30% of the item bid price.
- Upon completion of training and receipt and acceptance by the department of approved Operating and Maintenance Manuals the contractor will be paid the remaining 10% of the item bid price.

64. Span Guides, Item SPV.0105.504.

A Description

Under this item, remove and replace span guide rails, rollers, shafts, bearings, support brackets, and lubrication fittings. Install, adjust, paint, lubricate, test and place in satisfactory operation the Span Guides in each pier.

The span guides consist of the following major components:

<u>MK</u>	<u>Item</u>	<u>Total</u>	<u>New</u>	<u>Refurbish</u>
GR-1	Span Guide Rail	4	X	
S-5	Span Guide Roller Shaft	4	X	
R-1	Span Guide Roller (expansion end)	2	X	
R-2	Span Guide Roller (fixed end)	2	X	
B-3	Span Guide Roller Bearing	8	X	
RB-1	Span Guide Roller Support Bracket	4	X	
TB-5	Roller Guide Thrust Bearing	8	X	

B Materials

B.1 General

Materials used to fabricate the new span guide components and lubrication charts shall be as shown on the contract documents, and according to the requirements specified in Bridge Machinery - General provisions.

Fabricate new galvanized and painted support brackets meeting the requirements of ASTM A36, hot dipped galvanized to the requirements of ASTM A153, and painted with approved paint system. Fabricate new fixed and expansion end span guide rollers and shafts of material meeting the requirements of ASTM A668 Class G. Fabricate new bronze thrust bearings meeting the requirements of ASTM B438 CT-1000-K26. New guide rails shall be ASCE Std. 85. New guide rail clamp plates and fillers shall meet the requirements of ASTM A36.

B.2 New Bearings

Replace the eight existing span guide roller bearings with part No 1039Z by Link Belt or equivalent.

C. Construction

C.1 Removal of Equipment

Remove the span guide machinery. Remove existing anchors bolts for existing roller support bracket flush with the concrete. Disposal of the machinery components not reused shall be accomplished in accord with existing local, state and federal regulations. All HAZMATS (Oils, greases, etc.) shall be handled as required by the appropriate EPA regulations. Remove existing anchors for existing roller brackets to the surface of the pier concrete.

C.2 New Guide Rollers and Shafts

Fabricate new shaft and roller assemblies according to the contract documents.

C.3 New Roller Support Brackets

Fabricate new roller support brackets according to the contract documents. Install using Hilti HVU/HAS Stainless Steel or equivalent adhesive anchors.

C.4 Guide Rails

Remove the guide rails from the structural steel. After the structural steel has been reconditioned according to the contract documents, install the four new guide rails with new rail clamps and high strength galvanized fasteners. While the bridge is supported only at the jacking beam cylinder locations, each rail shall be reinstalled plumb, aligned with the center of the span guide rollers. All rail clamp plates, fillers and hardware shall be replaced with four bolt tight clamp type clamps. Install new rail clamps using bolt holes from their existing locations and shim as required for alignment.

C.5 Span Guide Alignment

Align each roller and guide rail such that there is 1/8" clearance at 70°F. The sum of the clearance between roller and guide rail on each pier shall not exceed 5/16" throughout the travel of the lift span. Provide fasteners of required length to accommodate shims that may be necessary to align the span guides.

C.6 Lubrication Chart

Furnish and install lubrication charts as described in Bridge Machinery – General provisions covering all lubrication requirements of the Span Guides.

D Measurement

The department will measure Span Guides 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.0105.504	Span Guides	LS

Payment is full compensation for furnishing all materials, labor, tools and equipment necessary to manufacture, assemble, install, erect, test, lubricate, paint and perform all incidental work to achieve a complete and acceptable installation.

Submit to the engineer for evaluation a full and complete breakdown of all costs under this item. The engineer has full authority to revise the breakdown, to suit his/her judgment, and make the various tasks more in conformity with the adjudged true values. The contractor agrees the detailed breakdown shall not be effective until it has been approved by the engineer.

Progress billing payments will be based upon the approved breakdown. Progress payments for Span Guides shall be made according to the department's standard payment practices and in the following manner:

- Upon completion and acceptance by the department of all shop detail drawings, the contractor will be paid 5% of the item bid price.
- Upon completion and acceptance by the department of shop fabrication, shop inspection, shop testing, delivery and storage of materials, the contractor will be paid 35% of the item bid price
- Upon completion and acceptance by the department of the Span Guides installation, alignment, bolting and protection of materials, the contractor will be paid 20% of the item bid price.
- Upon completion and acceptance by the department of the Span Guides inspection and field testing the contractor will be paid 30% of the item bid price.
- Upon completion of training and receipt and acceptance by the department of approved Operating and Maintenance Manuals the contractor will be paid the remaining 10% of the item bid price.

65. Bridge Electrical Work, Item SPV.0105.505.

A Description

A.1 General

Under this item, furnish, install, test, and place in satisfactory operating condition the complete electrical system for control and operation of the Wells St. vertical lift bridge, including 480V switchboard cabinet, HPU relay cabinet, transformer, revisions to existing

control desk, field start up service, spare parts, and all required provisions for interlocking complete with all accessories as specified herein and as shown on the plans.

The control system specified herein for the Wells St. Bridge shall be coordinated as required, with the work of all other sections of the specifications and the plans, so that all installations shall operate as designed. Specific coordination is directed toward mechanical/hydraulic work. The electrical control equipment shall be tested as an integral part of the hydraulic equipment at the hydraulic system provider's facilities.

The work includes removal of the existing hydraulic power unit (HPU) and its existing control relay and associated wiring. Remove and dispose of existing conduit and wiring for the existing HPU and the existing generator. Traffic gates are being removed and reinstalled.

This item also includes work required for the design and installation of a Programmable Logic Controller (PLC) and an Uninterruptible power supply (UPS) for future remote control capabilities of the Wells Street Lift Bridge. The PLC shall monitor and control all devices required to operate the bridge including but not limited to traffic lights, traffic gates, bridge hydraulics, limit switches, horn, bells, etc. Bridge position shall be monitored for fully seated, fully raised, near open, near closed, bridge raising, and bridge lowering. The bridge control logic is relay based. Provide interposing relays as required to separate relay logic control from PLC input and output (I/O). Add wiring and terminal strips as required to interface PLC I/O with relays.

Any apparatus, device, circuit, appliance, material, or labor not herein specifically mentioned or included, but that may be found necessary to complete or perfect the installation and equipment in a manner acceptable to the engineer, shall be furnished by the contractor as if specifically included in these specifications, and without extra cost to the department.

A.2 Reference Standards

Portions or all of certain recognized industry or association standards referred to herein as being a requirement of these specifications shall be considered as binding as though reproduced in full herein unless supplemented and/or modified by more stringent requirements in this specification. Unless otherwise stated, the reference standard shall be the standard which is current as of the date of issuance of these specifications. Reference may be made to standards either by full name or, for the sake of brevity, by letter designation as follows:

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute, Inc.
ASME	American Society of Mechanical Engineers
AWG	American Wire Gauge
EPA	Environmental Protection Agency
IES	Illuminating Engineering Society
ICEA	Insulated Cable Engineer's Association
JIC	Joint Industrial Council

NEC	National Electrical Code of NFPA
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
UL	Underwriters' Laboratories, Inc.

A.3 Permits and Codes

The electrical installation shall comply with the National Electrical Code and all applicable laws and ordinances in effect at the construction site and with regulations of the utility companies furnishing power and telephone services to the site.

A.4 Drawings and Specifications

A.4.1 General

Omissions from the drawings and specifications, or the misdescription of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the contractor from performing such omissions and details or work, but they shall be performed as if fully and correctly set forth and described in the drawings and specifications. In any case of discrepancy in figures, catalog numbers, or descriptions in the drawings or in the specifications, the matter shall be properly submitted to the engineer who shall promptly make determination in writing. Any adjustment in the plans by the contractor without written approval shall be at the contractor's own risk and expense.

A.4.2 Equipment Locations

The layout drawings show, in general, the arrangements and location of all equipment. This shall be considered as illustrative and subject to the approval of the engineer; the contractor shall modify it as necessary, for complete and proper construction and operation. The location of the conduits, boxes, and equipment shown on the plan is diagrammatic only, and may be subject to shifting as required or as the engineer may direct in order to conform to local conditions. The design drawings may be utilized in the preparation of the shop or as-built drawings showing the permanent construction as actually made.

A.4.3 Circuit-and-Raceway Schedules

Specification and data sheets for most of the circuits and raceways are included in the drawings. These data sheets fully describe the raceways shown on the plan sheets, and fully describe the circuits enclosed in the scheduled raceways. Raceways and circuits used solely for lighting and general purpose receptacles are shown only on the plans, and are not included in the schedules.

The Raceway Schedule is keyed to the raceway numbers as they appear on the plan sheets. The schedule gives the raceway type (galvanized steel - GRS, PVC coated rigid steel - PVGRS, etc.), fill (total area of enclosed circuits) trade size (nominal inside dimension), and a list of the enclosed circuits.

The Circuit Schedules are keyed to the circuit numbers as they appear in the wiring diagrams. The schedules give the origin and destination of each circuit, the number of cables in the circuit, the description of each cable in the circuit (size in AWG, type per data sheets in this specification, and number of conductors in each cable), area of each cable, and a listing of all the raceways that the circuit is routed through.

A.5 Submittals

Within 90 days after execution of the contract, full size shop drawings shall be submitted to the engineer for the PLC, input and output devices, power supply for PLC, uninterruptible power supply, interfacing devices, all related equipment, fasteners and other such equipment. No equipment is to be purchased without approved shop drawings. The Control System Vendor shall review, coordinate and prepare as necessary all shop drawings pertaining to the bridge operating control system before submitting these drawings to the engineer for his review.

Shop drawings shall include manufacturer's test data, shall be certified by the manufacturer, and shall identify the application for which they are proposed.

Catalog pages showing more than one model or size shall be marked to indicate the model or size proposed.

Shop drawings of cabinets containing electrical equipment shall include outside dimensions, areas for conduit penetrations, one-line and three-line diagrams, wiring diagrams, schematic and interconnection diagrams, terminal block arrangements and numbers if such terminal blocks are intended for connection of field wiring, and operating instructions.

Layout drawings showing all interconnections to the relay control system and wiring diagrams shall be provided for the programmable controller cabinet.

Submit manufacturers qualifications, system integrators qualifications and programmer's qualifications.

Test procedures shall be submitted for approval prior to performing any factory acceptance tests.

If requested by the engineer, the contractor shall submit for inspection, samples of the proposed substitute items at no cost to the City. All support data shall be submitted for checking. The City will not be liable for any materials purchased or work done or any delay incurred prior to their review. Failure of the engineer to note unsatisfactory materials as received will not relieve the contractor from responsibility. Manufacturers' guarantees or warranties on materials shall be delivered to the engineer upon receipt of the materials.

Working drawings shall be made on Standard 11 in. by 17 in. sheets. Catalog cuts and manufacturers' standard drawings may be submitted on their respective standard sizes. They shall be submitted to the engineer for review and distribution.

The engineer will not be responsible for errors of working drawings, even though approval has been indicated, or for quantities or bills of material which may be included. Any failure of the engineer to correct errors on working drawings, or implied approval thereof, shall not relieve the contractor of the full responsibility for the safe and adequate execution of the work in accordance with the plans and specifications.

After review of the working drawings by the engineer, no changes shall be made without resubmission for approval by the engineer, and all changes or revisions later made shall be clearly marked and dated.

A.6 Quality Assurance

Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

(1) **Maintenance Proximity:** Not more than two hours' normal travel time from Installer's place of business to Project site.

Manufacturer Qualifications: Company specializing in manufacturing the product specified with minimum five years documented experience. Maintain, within 200 miles (160 km) of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

A.7 Construction Requirements

All construction and installation shall be made by workmen skilled in this type of work and under the supervision of an experienced and qualified electrical supervisor. In addition, the approved Control System Vendor shall provide supervisory assistance to the electrical contractor as specified herein before. All work shall be executed in a neat and workmanlike manner and shall present a neat and mechanical appearance when completed. Upon completion of the contract, the contractor shall deliver to the engineer a corrected plan showing in detail all changes on construction from the plans, especially location and sizes of conduits, complete schematic circuit diagrams and the like.

All terminal strips shall be provided with approved permanent terminal markings for each connected conductor in service. The marking shall be placed on a material which will not be affected by age or moisture and shall be given two coats of clear lacquer after the markings are placed thereon.

B Materials

B.1 General

The Electrical Equipment and its installation shall be in accordance with regulations of the NEC and shall conform to Section 8 of AASHTO's LRFD Movable Bridge Design specifications and current interim specification except as otherwise provided herein.

All materials and equipment furnished under these specifications shall be new and, to the extent possible, standard products of the various manufacturers. Where more than one of any specific item is required, all shall be of the same type and manufacturer. Items of

equipment or material which are not specifically defined herein shall conform to the general standard of quality established herein.

Each piece of electrical equipment and apparatus shall have a permanent type corrosion-resisting metal nameplate on which is stamped the name of the manufacturer, the catalog or model number, and the rating or capacity of the equipment or apparatus.

All electrical devices, printed circuit boards, including their components, and any other electrical or electronic parts, shall be completely identified in such a way as to be easily procured from a supplier of that device. All prints and drawings of same shall show complete circuitry and identify all components as to their specific use and function in the circuit.

Retain the services of a qualified control system integrator who shall have complete system responsibility for the detailed integration of all system components, in order to ensure a complete operating system is furnished and installed in accordance with specified requirements of this project. The control system integrator shall be responsible for ensuring total compatibility of all equipment and devices furnished and installed and shall provide supervisory assistance in the selection, installation and integration of all bridge control system and associated equipment. Components associated with bridge control system include but shall not be limited to control console, switchboard cabinet, relay cabinet, and interfacing equipment and other facilities as may be required.

The control system integrator shall be responsible for the review of shop drawings, prior to submission to the engineer, to ensure that all components of the bridge operating system submitted for use are compatible in every respect and that all components meet or exceed the specific requirements and intent of the project. The total bridge operating system shall be subject to the approval of the engineer, based on the specified project requirements.

The control system integrator shall ensure maximum reliability and ease of maintenance for all components of the operating system and shall be responsible for all training of the bridge operator staff and for the supervision of all trial operations. The system integrator must have demonstrable competence in providing electrical control systems for movable bridges of various types, particularly vertical lift types, but including bascule lift, and swing type bridges utilizing relay logic. Such competence shall be demonstrated by identifying a minimum of three movable bridges for which he has provided complete systems within the past five years.

The control system vendor shall be of a caliber and background similar to that of Link Controls, Inc. of Ronkonkoma, NY, (631) 471-3950, Panatrol Corp, Burr Ridge, IL, (630) 655-4700 or approved equal.

System integrator shall make available a field service staff with the capability of providing services for field coordination of construction and final adjustments to the control system to the satisfaction of the engineer. Field staff shall be capable of responding, at the site, to an emergency within 24 hours.

Name and written qualifications of the proposed system vendor shall be included in the bid proposal and shall be subject to approval by the engineer.

All ferrous metal work shall be hot-dip galvanized in accordance with ASTM A123 or ASTM A153, whichever is applicable. If any galvanizing is damaged, the metal work shall be refinished by cleaning and painting, with two coats of approved galvanizing repair paint, or approved zinc chromium paint.

Lock washers shall be provided on all mechanical fastenings.

In order to prevent deterioration due to corrosion, all bolts, nuts, studs, washers, pins, terminals, springs, hangers, cap screws, set screws, tap bolts, brackets, and other hardware fastenings and fittings shall be of an approved corrosion-resisting material such as silicon bronze, or stainless steel. Hot-dip galvanizing, per ASTM Specification A 153, will be considered approved treatment for all non-moving ferrous hardware.

B.2 Shop Drawings

Within 90 days after execution of the contract, submit shop drawings to the engineer. Submit full size drawings for those items requiring construction from such drawings. Provide descriptive leaflets for standard catalog items which are mass produced.

Submit shop drawings for all cabinet enclosures, motors, panel boards, span brakes, transformers, switches, raceways, conductors, wiring devices, lighting fixtures, lamps, service equipment, boxes, control equipment, fasteners and other such equipment, and methods of fastening to structures. No equipment is to be purchased without approval of shop drawings. The control system vendor shall review, coordinate and prepare as necessary all shop drawings pertaining to the bridge operating control system before submitting these drawings to the engineer for his review.

Shop drawings shall include manufacturer's test data, shall be certified by the manufacturer, and shall identify the application for which they are proposed.

Equipment identification shall be the same as shown on the drawings. Standard drawings showing more than one model or size shall be marked to indicate the model or size proposed.

Shop drawings of cabinets containing electrical equipment shall include outside dimensions, areas for conduit penetrations, one-line and three-line diagrams, wiring diagrams, schematic and interconnection diagrams, terminal block arrangements and numbers if such terminal blocks are intended for connection of field wiring, and operating instructions.

Provide layout drawings and geographic wiring diagrams for the control desk, 480 Volt switchboard cabinet, and for the HPU relay cabinets.

Submit shop drawings when installation and mounting details of switches, fixtures, and devices are different from or not specifically detailed on the drawings.

If requested by the engineer, submit for inspection samples of the proposed substitute items at no additional cost to the department. Submit all support data in quintuplicate for checking. Neither the department nor the engineer will be liable for any materials purchased or work done or any delay incurred prior to their review. Failure of the engineer to note unsatisfactory materials as received will not relieve the contractor from responsibility. Deliver manufacturers' guarantees or warranties on materials to the engineer upon receipt of the materials.

Working drawings shall be made on standard 22 in. x 34 in. sheets. Catalog cuts and manufacturers' standard drawings may be submitted on their respective standard sizes. Submit them to the engineer for review and distribution.

The engineer will not be responsible for errors of working drawings, even though approval has been indicated, or for quantities or bills of material which may be included. Any failure of the engineer to correct errors on working drawings, or implied approval thereof, shall not relieve the contractor of the full responsibility for the safe and adequate execution of the work in accordance with the plans and specifications.

After review of the working drawings by the engineer, no changes shall be made without resubmission for approval by the engineer, and all changes or revisions later made shall be clearly marked and dated.

Before final payment is made, deliver to the department two sets of as-built drawings reflecting all changed or modifications made from the contract drawings having to do with the finished structure. One set of as-built drawings will be given to the department.

As-built drawings shall be suitable for permanent storage, and any reproducible material which is subject to fading when exposed to light will not be acceptable.

B.3 References

Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar in design. Whenever any article, materials, or equipment is defined by describing a proprietary product, or by using the name of a manufacturer or vendor, the term "or approved equal", if not inserted, shall be implied, except as otherwise noted.

B.4 Substitutions

Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar in design.

Equipment for which an acceptable manufacturer is not specifically named, or named equipment for which substitution is proposed, shall be manufactured by a company which has had a minimum of ten years of experience in the manufacture of similar equipment and

which, in the engineer's opinion, has demonstrated its proficiency in the manufacture of such equipment. All equipment will be subject to the engineer's approval.

B.5 Structural Steel

Material for support of limit switches shall conform to the requirements of ASTM A36 structural carbon steel. Bolts used shall conform to the requirements of ASTM A325 Type 1 bolts and hardened steel washers shall be provided as shown in the plans. All new material shall be hot dipped galvanized with approved 2 coat paint system specified under bridge Structural Steel.

B.6 Programmable Logic Controller

All analog and digital logic functions required to control, interlock, and coordinate the span drive machinery and associated auxiliary systems shall be performed by the programmable logic controller (PLC).

The PLC equipment shall be installed in a single cabinet. The programmable logic controller cabinet shall be installed in the HPU cabinet. This cabinet shall house the main central processor unit (CPU) and a redundant CPU, input-output units (I/O's), modem communication equipment and all other associated equipment. The PLC equipment in the cabinet shall interface the control desk, the control relays, and the HPU.

B.7 CPU Memory

Each central processor shall have a metal oxide semi-conductor memory with a battery backup power system. Batteries shall be able to support the memory for not less than three months without external power. The CPU shall have a contact which will alarm the system with a contact closure in the event the battery power reaches a critical low level.

A key operated selector switch shall disallow changes in the stored program while in the "Operate" position.

The status of the inputs and outputs shall be checked at the time they are called for in the program rung the CPU is operating on.

The outputs shall be available to be turned "ON" or "OFF" as soon as its rung has been scanned.

The CPU shall check the parity of each word at the time it is scanning that word. An alarm contact to the Annunciator System shall be provided to indicate a trouble whenever trouble occurs in the programmable control system. The CPU shall contain "trouble" lights to indicate memory parity errors or processor malfunctions.

All CPU operating logic shall be contained on plug-in cards for ease of replacement. Chassis wired logic is not acceptable.

The memory unit shall have spare program capacity equal to 30 percent of the memory used.

B.8 Power Supply and UPS

Power Supply

The power supply module shall be isolated from the commercial power source by a constant voltage transformer/power conditioner to prevent electrical system noise and voltage fluctuations from interfering with the operation of the CPU. Unit shall be rated 60 Hz, 120 volts, with an output regulation of +4% to -8%, for an input variation of +15% to -25% of a nominal voltage of 115 volts. Unit shall have power capacity required by the system. Provide surge protection to protect the control cabinet and other electrical subsystems from transients caused by lightning, electrostatic discharge, and ground surges.

Uninterruptible Power Supply

Provide Uninterruptible Power Supply (UPS) to backup PLC network and communication switches. UPS shall be capable of supplying 125% of load for 15 minutes after power failure. Provide form C outputs for utility power failure and battery discharged and/or battery failure. UPS shall be online double conversion with automatic bypass, hot swappable batteries, power management software, and USB and Serial port. Manufacturer shall be APC or approved equal.

B.9 PLC Programming and Software

The program shall be entered using an IBM Compatible Laptop Computer. Software shall be by Allen-Bradley and fully compatible with the CPU. Provide a fully compatible laptop computer complete with software. The laptop computer and all software shall be turned over to the owner at the completion of the project.

Each of the following logic symbols shall take no more than one word of CPU memory:

- (1) coil with address
- (2) normally closed contact with address
- (3) normally open contact with address
- (4) branch open
- (5) branch close

The CPU shall automatically close gaps in memory when logic statements are removed, thus eliminating no operations (NOP's) in memory.

It shall be possible, at any time by means of a permissive key interlock, to modify an existing program in memory by inserting one or more ladder diagram rungs between any two existing (previously programmed) rungs. This ability to insert rungs of unspecified word length shall be accomplished by the technique of automatic "gap open", not by the imprecise method of reserving "contingency" blocks of memory for future changes.

It shall be possible to connect programming equipment to the CPU while the CPU is running without interfering with the operation of the CPU.

It shall be possible to record programs stored in the CPU memory on disk. Disk drive hardware shall be provided with the lap top computer.

It shall be possible to copy programs stored on disk into the CPU memory.

It shall be possible to verify programs stored on disk against programs stored in the CPU memory.

It shall be possible to monitor the contents of the various timer and analog registers shown in the drawings.

It shall be possible to communicate with the CPU at the bridge site and the lap top computer located at a remote location via a modem. Modem equipment and necessary software shall be provided with the PLC equipment and the lap top computer.

Software: A complete development software package shall be provided to the owner. The software shall allow the user to perform all programming functions, including program and graphics development. The PLC shall be programmable in ladder diagram language with function blocks as required. All required software shall be provided and the program shall perform the functions indicated and required. After equipment is installed, any program modifications necessary shall be made to produce the intended operation. The contractor will provide documentation of the programmer's experience at the time of the bid. The contractor shall utilize personnel with at least 3 years' experience. Ladder logic will be according to the following general guidelines:

- (1) Input, Output, Bit, Integer and Float addresses should have symbols attached to them. These symbols should indicate the use of a bit or word.
- (2) Instruction symbols should be added in addition to the symbol, particularly if a symbol does not clearly describe the use of an address.
- (3) Rung comments should be used on rungs to describe the logic and intention of that rung or group of rungs.
- (4) Logical section of the PLC ladder programming should be divided into different ladder files.

B.10 PLC Documentation

The supplier shall furnish Instruction Manuals described under "Instruction Books" in this Specification. In addition, these manuals shall include operation of the equipment, programming of the equipment, theory of operation, maintenance information, schematics of all cards or units within the system, and point-to-point wiring diagrams.

Provide documentation of the PLC Program which shall include:

- (1) Ladder diagram printout.
- (2) Rung address.
- (3) Contact addresses and English contact description.
- (4) Cross reference of rungs which control contacts.
- (5) Cross reference of contact controlled by each rung.
- (6) English comments before each series of rungs.
- (7) Cross reference to relay numbers in plans.

This documentation shall be by Allen-Bradley or engineer approved equal.

B.11 PLC Manufacturer

The PLC shall be as manufactured by Allen Bradley Control Logix series with Ethernet I/P port for communication to external locations or approved equal.

B.12 PLC Cabinet

The cabinet housing the PLC shall be in the HPU Relay Cabinet. See plans for cabinet details.

Provide mounting for all PLC related equipment. UPS may sit on bottom of cabinet floor.

B.13 Redundant Backup PLC

The programmable logic controller system shall be arranged such that both the main and redundant processors shall be programmed with identical information, operate on the same time base and run in complete synchronization, except that the redundant processor outputs shall be electrically isolated from the main system. In the event that trouble or failure of the main CPU shall occur, transfer to the redundant CPU for bridge operations shall be made automatically. Indicating lights shall be installed on the HPU cabinet door indicating what CPU is in service.

B.14 System Input and Output (I/O's)

System Input and Output (I/O's)

I/O frames shall be completely prewired for a full complement of I/O boards.

Additional I/O frames (up to the maximum PC capacity) can be added at any time in the field.

I/O modules shall have key slots which are unique for each card type, so that the wrong card type cannot be inadvertently installed in a slot that was programmed for a different card type.

I/O cards shall be replaceable without removing panel wiring.

I/O cards shall provide at least one common terminal for every two inputs or outputs.

Inputs and outputs shall be provided with reed relay or optical isolation between field circuits and internal circuitry.

Status lights shall be provided for each input or output amplifier indicating a signal is present to turn the input or output "ON".

Outputs shall be fused, and the fuses shall be easily removable without the use of special tools.

Output cards used only for pilot light or annunciator lamp box service shall have a minimum continuous load capacity of 0.25 amperes at 120 VAC.

Output cards used for other loads shall have a minimum continuous load capacity of 1.5 amperes, and shall be capable of operating and withstanding the operating and surge characteristics of a NEMA size 4 starter.

Analog inputs and outputs shall have a range of 4 to 20 milliamperes. Conversions between external analog signals and internal numeric values shall have a resolution of no less than one part in 999.

Timers shall be available through programming of counters utilizing time base inputs to counters. Time bases shall be available in seconds and tenths of seconds.

B.15 Data Logging

A Bridge Activity Movement Report shall be included as a part of the data logging system. The report shall contain the following information:

(1) Date, time of opening initiated, time span off seat position, time span motors stopped and position of span, time span motors began to lower, time span motor stopped and span position, and time bridge opened to rail traffic.

(2) Each time the span motors are stopped, whether raising or lowering, the Data Logging System shall report the time and position of the span, regardless of whether the span is fully open or fully closed.

The Activity Report shall be formatted as shown:

Bridge Activity Report

(Example)

Date: 1-1-2018

Time Opening Initiated: 10:30:02

Lift Span off Seat: 10:32:22

Lift Span Drive Motors Stopped at: 10:35:00

Lift Span Position: 10.0 Feet

Lift Span Lowered: 10:47:22

Lift Span Seated: 10:49:52

Lift Span Position: 00.0 Feet

Time Opening Completed: 10:50:25

Time of Opening: 00:20:23

B.16 Network

PLC shall be capable of connecting to City of Milwaukee fiber optic network.

B.17 PLC Quality Control

All PLC equipment (CPU, I/O frames, input cards, output cards, multiplexer, cables, etc.) shall undergo a minimum of 100 hours continuous burn-in prior to shipment. Burn-in shall be done while carrying temperature between rated limits of the device and cycling the equipment through a program.

PLC equipment, including programming devices, shall be tested to ensure their proper operation in the presence of both radio frequency and electrical noise.

C Construction

C.1 General

All construction and installation shall be made by workmen skilled in this type of work and under the supervision of an experienced and qualified electrical supervisor. In addition, the approved control system vendor shall provide supervisory assistance to the electrical contractor as specified herein. All work shall be executed in a neat and workmanlike manner and shall present a neat and mechanical appearance when completed. Upon completion of the contract, deliver to the engineer a corrected plan showing in detail all changes on construction from the original plans, especially location and sizes of conduits, complete schematic circuit diagrams and the like.

Provide all terminal strips with approved permanent terminal markings for each connected conductor in service. Place the marking on a material which will not be affected by age or moisture and apply two coats of clear lacquer after placing the markings.

C.2 Raceways

C.2.1 General

All conduit shall be of the material called for in the plans. All conduits shall be free from blisters, cracks, or injurious defects. Wiring troughs (wireways) shall be NEMA 12 rated.

Raceway sizes shall be as shown on the plans, and shall be 3/4" minimum trade size.

C.2.2 Galvanized Rigid Steel Conduit

The conduit shall be UL listed and shall comply with the requirements of ANSI Standard C80.1 "Specifications for Rigid Steel Conduit (Zinc-Coated)". Manufacturers shall be Allied, Steel duct, Triangle, Youngstown, or approved equal.

All rigid steel conduit fittings shall be hot-dip galvanized after fabrication in accordance with ASTM A153. Manufacturer shall be Appleton Electric, Crouse-Hinds, O.Z./Gedney, Pyle-National, Russell & Stroll, Thomas & Betts, or approved equal.

After field threading, re-galvanize all steel conduit with "Zinc Rich", "Zincilate 810", or "Galvanizing Powder M 321". Apply this material in the field, immediately after the conduit is threaded and cleaned.

C.2.3 PVC Coated Galvanized Rigid Steel Conduit

The PVC coated galvanized rigid conduit shall be UL listed. The PVC coating must have been investigated by UL as providing the primary corrosion protection for the rigid metal conduit and be UL Listed. The PVC coated rigid galvanized steel conduit must be certified and authorized to apply the ETL Verification Mark "ETL Verified to PVC-001". ETL Verified to Intertek ETL SEMKO High Temperature H2O PVC Coating Adhesion Test Procedure. Continued compliance to this specification is monitored through production testing, quarterly inspections by Intertek ETL SEMKO at production facility and random sample testing. Ferrous fittings for general service locations must be UL Listed with PVC as the primary corrosion protection. All conduit and fittings must be new, unused material. The PVC coating shall be gray, 40 mils in thickness, and be free of blisters, bubble, or pin holes. Applicable UL standards may include: UL 514B Standard for Safety, Fittings for Conduit and Outlet Boxes. Conduit and fittings shall be evaluated for reliability and performance. Certified test results are the respective test data that have been witnessed and certified to be accurate by an independent, recognized third party. Acceptable conduit and fitting PVC bonds shall be confirmed with a minimum average of 30 days in a heat and humidity test (ASTM D1151 and D2247) with the temperature at 150 degrees F and 95% humidity. Acceptable seal performance shall be confirmed at 15psig (positive) and 25 inches of mercury (vacuum) for 72 hours. Manufacturer shall be Perma-Cote Industries or approved equal by Plasti-Bond or Rob-Roy.

All conduit and fittings shall be hot-dip galvanized inside and out with hot galvanized threads prior to applying plastic coatings. All exterior surfaces shall be coated with a heat polymerizing adhesive not to exceed .0005" thick prior to plastic coating. The exterior plastic coating shall be bonded to the metal with a thickness of .040" nominal the full length of the pipe except the threads. Interior coating shall be 2 mil minimum urethane.

Repair any nicks or gouges in the PVC coating after installation with manufacturer's approved touch-up compound to restore corrosion protection.

All fittings, support struts, pipe clamps, etc, shall be PVC coated to meet all requirements of the conduit manufacturer.

C.2.4 Liquid-tight Flexible Metal Conduit

Liquid-tight flexible steel conduit shall be constructed of a flexible galvanized steel core made from continuous steel metal and an extruded PVC cover. Conduit shall be Anaconda Type UA, Electri-Flex Type LA, Rob-Roy Flex, or approved equal.

Fittings shall have insulated throat and be UL labeled. An “O” ring assembly shall be used on each fitting. Manufacturers shall be Appleton Electric, Ideal Industries, Thomas & Betts, or approved equal.

C.2.5 Rigid Nonmetallic Conduit

The conduit shall be rigid polyvinyl chloride, schedule 80, 90 degree C, of the sizes indicated on the plans and shall conform to the NEMA standards. Conduit shall be UL listed in conformity with Article 347 of the National Electric Code. Conduit, fittings, and cement shall be produced by the same manufacturer who shall have had at least five years' experience in manufacturing these products. All joints shall be solvent welded in accordance with the recommendation of the manufacturer.

C.2.6 Wireways

Wireways shall conform to NEMA Standards for wireways. Installation of wireways are to be installed within the control tower only and are not permitted in the pier areas or in outdoor locations and shall be of the size indicated on the plans. Wireways shall be NEMA 1 rated and constructed from 14 gauge steel. Access covers shall be of the hinge/screw type to permit easy access to lay in cables. Wireways shall be finishes with ANSI 61 gray polyester power coating both inside and out over phosphatized surfaces.

Provide wireways at the elevation and locations shown on the plans. The interconnections of the sections, fittings and other components shall provide a rigid mechanical assembly with splice plates properly installed to avoid structural weakness. Locate wireway splices at the ¼ points of the span between supports.

Wireways shall run parallel or perpendicular to the main structural lines of the building. Wireways shall be mechanically connected at joints, fittings, and terminations, and shall provide a continuous ground path.

Support wireways trays as shown on the drawings, at the midpoint of each horizontal bend and in accordance with manufacturer's recommendations.

C.2.7 Installing Raceways

Connect conduit sections to each other with screw couplings, made up so that the end of both conduits will butt squarely against each other inside of coupling and non-metallic conduit shall be solvent welded in accordance with the manufacturer's recommendations. Install conduits so as to be continuous and watertight between boxes or equipment. Protect conduits at all times from the entrance of water and other foreign matter by capping or well plugging overnight and when the work is temporarily suspended.

Install all conduits so that they will drain properly. Provide drainage tees at low points where required.

All field bends shall be long sweep, free from kinks, and of such easy curvatures as to facilitate the drawing in of conductors without injury. Conduit runs shall be made with as few couplings as standard lengths will permit, and the total angle of all bends between any two boxes shall not exceed 360 degrees. Long running threads will not be permitted.

Use pull boxes wherever necessary to facilitate the installation of the conductors. Condulets shall not be used for pulling more than ten conductors or for making such turns in conduit runs or for branching conductors, except for indoor wiring to lighting fixtures and receptacles.

Galvanized rigid steel (GRS) conduit shall be installed only within the control towers and where the areas remain dry. PVC coated rigid steel (PVGRS) shall be installed within the pier areas and in areas where the conduit will be exposed to wet environments. Rigid non-metallic (PVC) conduit shall be installed where ever the raceway is to be buried below grade or within concrete.

All conduit fittings shall be of the same type material as the conduit installed.

Where conduits pass through the floors or walls of the control room, galvanized rigid conduit sleeves shall be provided for free passage of the conduits. After the conduits are installed, caulk the opening with an elastic fireproof compound and escutcheon plates provided on the interior walls, ceilings, and floors for airtight fits.

Where wireways pass through floors or where conductors are required through floors for access to electrical equipment as shown on the plans, fill the openings and caulk with a fire proofing sealant after all conductors are installed. Where conductors pass through floors without the use of a wireway, provide escutcheon plates. Where wireways pass through floors, access panels shall be removable on both sides of the floor penetration when applicable. Sealants shall be manufactured by Carborundum, Dow Corning, Nelson Fire Stop Products, or approved equal.

Exposed raceway runs shall be straight and shall be parallel or at right angles to the general structure lines. Attachment to steel or concrete in the pier areas shall be by stainless steel fittings, straps, or hangers held at not less than two points by stainless steel bolts or lag screws. Concrete inserts shall be Unistrut, B line, Midland Ross, or approved equal, fabricated from stainless steel. Conduits mounted exteriorly on parts of the steel work shall be set not less than 1.5 inches clear from the supporting structure to prevent accumulation of dirt, and they shall be securely clamped to the steel work to prevent rattling and wear. The clamps, in general, shall consist of stainless steel U bolts attached to stainless steel angle or stainless steel channel supports bolted to the members. The spacing of the clamps shall not exceed 6 feet.

Supports for electrical work which are fabricated from structural plates or shapes bolted to structural members and which are shown or requested to be included on the steel drawings, will be paid for under the items shown on the plans. Additional alterations and supports not shown or requested, but that are found necessary after completion of steel fabrication plans, shall be included for payment and additional compensation will not be considered.

See “Bridge Hydraulics” for coordination with bridge hydraulic system.

At any point where a conduit crosses an expansion joint, or where movement between adjacent sections of conduit can be expected, install bronze or alloy expansion fittings equal to Type AX as made by the O.Z. Electrical Manufacturing Company, Inc., Hope, Spring City, or approved equal.

Use of flexible conduit is allowed only for the connection of motors, limit switches, and other devices that must be periodically adjusted in position. Connections between the rigid conduit system and all movable motors, and movable limit switches shall be made with flexible conduit with couplings and threaded terminal fittings. The flexible conduit shall be fully interlocked and shall be Type RT 6 as made by the Flexonics Corporation, Type UA OR as Anaconda's Sealtite, Carflex by Carlon, or approved equal. Flexible conduit extensions shall not exceed 24 inches in length and shall be equipped with bonding jumpers.

All conduits shall be carefully cleaned, both before and after installation. Upon completion of the conduit installation, clear each conduit with a tube cleaner equipped with a mandrel of a diameter not less than 80 percent of the nominal inside diameter of the conduit, and shall then draw in the conductors.

Provide both ends of each conduit run with a brass tag having a number stamped thereon in accordance with the conduit diagrams. Securely and permanently fasten these tags to the conduit ends with bare copper wire.

C.3 Conductors

C.3.1 General

Furnish insulated conductors and conductor accessories in sufficient quantities for a complete installation. Installation shall be in accordance with the National Electrical Code, and shall include placement, splicing, terminating, identification, testing, and verification of each circuit and conductor.

Cable types, as shown on the plans, shall be as shown on the cable data sheets. The “type” as shown on the circuit schedules in the plans is the “type” referenced to at the top of each cable specification sheet. Unscheduled conductors for lighting circuits shall be Type B.

The “Outside Diameter” is the nominal diameter used to calculate the required conduit size. If actual cables used are of larger diameter, the contractor shall increase the size of the affected conduits, as required by the NEC, at no additional cost to the department.

C.3.2 Acceptable Manufacturers

Acceptable manufacturers for types B, D, G, and H are American Insulated Wire, Okonite, Southwire or approved equal. Acceptable manufacturers for type E are Okonite, American Insulated Wire, Belden or approved equal. Acceptable manufacturers for type FO are Belden, Alpha, Anixter or approved equal.

Provide a durable marking on the outer surface of all cables or conductors at intervals not exceeding 24 inches. Marking shall include manufacturer's name, insulating material, conductor size, and voltage class.

Each conductor, of power, control and signal wiring, shall be color coded with colored insulation. Color coding of power wiring shall be black for Phase A or 1, red for Phase B or 2, blue for Phase C or 3, white for neutral, and green for equipment ground. Switch legs for local wall switches shall conform to local Code requirements.

C.3.3 Circuit Identification

Each circuit, as shown in the Circuit Schedule on the plans, shall be identified at both ends with an identification tag. Tags shall be of an opaque nylon material arranged to include a marker board, non-releasing holding device, and cable fastening tail. The marking board shall be not less than 3/8 inch wide x 3/4 inch long, and 25 mils thick, roughened on one side to hold black nylon marking ink from a permanent marking pen. Identification shall be permanent and waterproof. Once installed, the tie shall not be removable except by cutting it loose from the cable.

C.3.4 Installation or Placement

Draw the wire and cables into conduits without causing injury to the wires or their insulation or covering.

Install all cables as recommended by the manufacturer. Adhere to the manufacturer's recommended maximum pulling tension and minimum bending radius during installation. Use the necessary guides, pulleys, sleeves, and pulling aids to prevent abrasion and damage to the cables during installation. Use lubricants recommended by the cable manufacturer and acceptable to the engineer for the pulling of conductors or cables. Permanently and clearly tag both ends of every single length of conductor with approved tags marked in accordance with the same number and designation shown on the wiring diagrams. Connect all outgoing wires No. 8 AWG or smaller in the control desk, on the switchboards and panels and in terminal cabinets to terminal blocks.

Spare conductors of a multi conductor cable shall be left at their maximum lengths for possible replacement of any other conductors in the cable. Coil each spare conductor and then tape it to the conductors being used.

Twisted shielded pair conductors or instrument conductors shall not be terminated at any point except at point of origin or point of finish. When instrumentation cables are required to cross the channel, cable run shall be continuous without cuts or splices. Should an occasion develop, instrument conductors may be required to be cut and spliced in order to

connect to other instrument conductors, the individual conductors and shielding shall be spliced in accordance with the manufacturer's instructions. The splice connections shall then be taped and wrapped to ensure adequate seal from noise and environment in accordance with the manufacturer's instructions.

Conductors inside terminal boxes and at the control panels and control desk shall be installed in plastic wire ways or shall be neatly formed into cables and laced with two strands of an approved wax-treated linen cord or plastic tie-wraps, with the individual conductors leaving the cable at their respective terminal points. These conductors shall be looped to allow not less than 3 inches of free conductor when disconnected. These formed cables shall be held securely away from the terminals and from contact with the cabinet by means of approved insulating supports. Wiring duct meeting JIC standards will be acceptable.

All terminal strips shall be provided with approved permanent terminal markings for each connected conductor in service. The marking shall be placed on a material which will not be affected by age or moisture and shall be given two coats of clear lacquer after the markings are placed thereon or as stated elsewhere in these Specifications.

Splicing of conductors will not be permitted except for wiring to service lighting fixtures and receptacles.

All splices, T taps, and free ends of 600 volt cables shall be insulated. General use cables shall be insulated with type 33 tape. High ambient cable shall be insulated with type 70 tape.

Wherever it becomes necessary to terminate, joint, or branch conductors, terminal blocks in boxes shall be used.

Cable connections for No. 8 and smaller, for making terminations and splices shall be with high pressure indent type pressure connectors. Connectors shall be copper and as manufactured by Buchanan Products, Burndy, Thomas & Betts, or approved equal.

Cable connections for No. 6 and larger for making terminations, T taps, and splices shall be with a high compression or bolted type pressure connector. Compression connectors shall be installed as recommended by the manufacturer using the recommended tooling for installation. Bolted connectors shall have a non-rotating pressure cap and as manufactured by Burndy, O.Z. Electric, Buchanan, or approved equal.

C.3.5 Tests after Placement

All insulated conductors shall be electrically tested after placement. All circuits, including lighting circuits, shall be tested with the circuit complete except for connections to equipment. All splices shall be complete prior to testing. Any circuit failing to test satisfactorily shall be replaced, or repaired and retested as directed by the engineer. All equipment and labor required for testing shall be provided by the contractor.

All insulated conductors shall be tested for continuity and conductor identification. In addition, all insulated conductors of multi-conductor cable shall be tested for short circuits. Furnish portable, battery powered, ring testers, and other test equipment as required for these tests.

(1) Continuity tests shall include all tests necessary to confirm that each conductor is continuous throughout its entire length.

(2) Identification tests shall include all tests necessary to confirm that the conductor being investigated originated and terminates at the locations designed in the Circuit List or indicated on the drawings.

(3) Short circuit tests shall include all tests necessary to confirm that no conductor of a multi-conductor cable is short circuited to another conductor in that cable.

(4) Power and control cable rated below 2,000 V. All insulated conductors, except instrumentation cable, rated less than 2,000 v. shall be tested with a 1,000 v. megger or an equivalent testing device. Insulation resistance measurements shall be made between each conductor and ground and between each conductor and all other conductors of the same circuit. Minimum acceptable resistance values shall be in excess of 100 Megohms.

(5) Instrumentation cable All insulated conductors of supervisory and communication cable shall be tested with a 500 V. megger or an equivalent testing device. Insulation resistance measurements shall be made between each conductor and the cable shielding tape and between the two conductors in each pair. Minimum acceptable resistance values shall be 50 Megohms divided by the actual cable length in miles.

TYPE B

600 Volt Single Conductor Flame Resistant Power Cable

DESCRIPTION:

Reference: ICEA S 66 524

Conductor: Class B Stranding, 90 DEG C, Standard Round Uncoated Copper

Insulation: Flame Resistant Cross Linked Polyethylene

Jacket: None

UL Listing: THWN

Tests: Flame Test Requirements per IEEE 383, using a gas burner flame source.

DETAILS:

<u>Size (AWG)</u>	<u>Number of Strands</u>	<u>Insulation Thickness-Inches</u>	<u>Outside Diameter-Inches</u>
12	7	.030	0.16
10	7	.030	0.18
8	7	.045	0.24
6	7	.045	0.28
4	7	.045	0.35
2	7	.045	0.40
1	19	.055	0.46
1/0	19	.055	0.51
2/0	19	.055	0.57
3/0	19	.055	0.60
4/0	19	.055	0.66
250	37	.065	0.73
350	37	.065	0.84
500	37	.065	0.97

TYPE E

600 Volt Single Pair Flame Resistant
Shielded Control Cable

DESCRIPTION:

Reference: ICEA S 19 81, ICEA S 68 516 (Interim Standard No. 1)

Conductor: 16AWG, 7 Strand, Class B Stranding, 105 DEG C, Standard Round Coated Copper

Insulation: Ethylene Propylene, 25 mil Thickness

Twisting: Approximately 4 Turns/Foot Staggered

Shield: Each pair, and the composite cable assembly-coated copper 20 AWG drain wire and aluminum/mylar tape over insulated conductors.

Jacket: Conductor and cable assembly flame resistant chlorosulfonated polyethylene, IPCEA S 19 81, fifth edition, part 4.

Conductor

Identification: One black and one white conductor per pair.

Tests: Each conductor and each finished cable shall meet the flame test requirements per IEEE Standard No. 383.

UL Listing: Each cable assembly shall meet NEC art 340 requirements for Type TC, and shall be sunlight resistant.

DETAILS:

<u>Number of Pairs</u>	<u>Jacket Conductor</u>	<u>Cable</u>	<u>Outside Diameter-Inches</u>
1	15 mils	45 mils	0.42
4	19 mils	60 mils	0.81

TYPE G

Bare Grounding Wire

DESCRIPTION:

Conductor: Standard Round Uncoated Soft-drawn Copper

Stranding: Sizes 8 AWG and smaller, solid; Sizes 6 AWG and larger, 7 strand, class B stranding

Insulation: None

DETAILS:

<u>Size (AWG)</u>	<u>Diameter (inches)</u>
8	0.13
2	0.29
1/0	0.74

TYPE S

Multi-Conductor Special Purpose
Communication and Data Cable

DESCRIPTION:

Reference: ICEA S 19 81, UL 2250

Type 22S8

Conductor: 22AWG, 7 Strand, 4 pair with Individual Shielding, XLP Insulation, PVC Jacket, 300 Volt, 90 degree C

Twisting: Each pair twisted, approximately 4 turns/foot

Use: Process Control, Span Position Data

Conductor

Identification: Red/Black, White/Black, Green/Black, Blue/Black

Suitable Mfgr: Belden No. 9330, Alpha Wire No. 6054

C.4 Boxes.

All exterior surface mounted pull, junction, splice, and terminal boxes shall be 14 gauge stainless steel, NEMA 4X, and shall be provided with hinged, overlapping covers of the same material, with pad-lock provisions and shall be by Hoffman Engineering Company, Hammond Manufacturing or approved equal. Wall-mounted boxes installed in the control house shall be NEMA 12. Junction boxes and terminal cabinets mounted in the machinery rooms shall be NEMA 12.

Furnish and install junction and pull boxes, reducers, and other fittings as required by these specifications or where required by the NEC or where required to facilitate pulling, whether shown on plans or not.

Provide drain holes in the boxes. Provide all boxes with mounting lugs and securely fasten to the structure with not less than four stainless steel through-bolts. All cast-iron boxes shall be bossed, drilled, and tapped for threaded conduit ends, which shall enter squarely. Sheet metal enclosures shall be drilled to receive the conduit ends, which shall be secured with insulated hub connectors. The conduit ends projecting into all boxes and enclosures shall be equipped with insulated bushings. No box or enclosure shall be drilled for more conduits than actually enter it.

Boxes for surface or exterior mounted wiring devices shall be weatherproof rated, cast-iron, hot-dipped galvanized, Type FS, FD, or approved equal.

Boxes for flush-mounted devices in finished areas shall be stamped galvanized steel.

Fasten device boxes to the mounting surface with not less than two bolts.

Fabricate framework for supporting boxes, switches, and other externally mounted electrical devices from structural steel Type A36 not less than 3/8 inch thick, or if material of thickness less than 3/8 inch is used it shall be hot-dip galvanized.

All mounting bolts, nuts, washers, and other hardware used for fastening boxes, disconnect switches, devices, lighting outlet boxes, conduit clamps, and similar devices shall be brass, monel metal, or stainless steel. Bolt heads and nuts shall be hexagonal, and bolts smaller than 3/8 inch diameter shall not be used except as may be necessary to fit the mounting holes in small devices, outlet boxes, and similar standard equipment.

C.5 Wiring Devices

General use, single pole, or 3 way switches shall be Arrow-Hart 1991 or 1993, Bryant 4901 or 4903, General Electric 5951 1 or 5953 1, Hubbell 1221 or 1223, or approved equal.

General use, duplex receptacles shall be Arrow-Hart 5262, Bryant 5262, General Electric 4065 1, or Hubbell 5262. GFI protection shall be provided by GFI circuit breakers or GFI receptacles where required by the CEC or NEC and as shown on the plans. Devices installed indoors shall be brown color.

Devices installed outdoors shall meet NEC Art. 410-57 and shall be corrosion-resistant, with gray fiberglass weatherproof covers, suitable for wet locations and U.L. listed.

Cover plate for flush installations shall be 0.040 inch thick satin finished Type 302 stainless steel. Cover plates for indoor surface installation shall be cast aluminum or cadmium-plated cast-iron. Covers shall fit Type FS or FD boxes without overlapping edges or corners.

C.6 Nameplates

Provide nameplates for all major pieces of equipment named on the drawings, for all devices on the control desk and in panels, and shall be made of laminated micarta or textolite with chamfered edges, and shall be engraved to show BLACK letters on a WHITE background. They shall be mounted with monel or stainless steel screws. Nameplates for devices shall show the device designation used on the schematic wiring diagram. Fuse nameplates shall show the type, ampere, and voltage rating of the fuses.

C.7 Motors

Motors shall be built in accordance with NEMA standards. All exposed metal surfaces shall be protected with a moisture-proof corrosion-resistant polyester paint or coating. Exposed unpainted and uncoated metal surfaces shall be of a heavy-duty corrosion-resistant material. The rotors shall be balanced mechanically and electrically. All windings shall be provided with special insulation to retard decrease in insulation resistance due to excessive moisture. Each motor shall have Class B insulation.

Install the motors with approved sizes and types of wire terminals and splice fittings for the connection of the motors to the circuit wiring. Furnish each motor with a cast-iron frame, bearing brackets with re-lubrication fittings and conduit connection box.

Hydraulic pump motors, unless otherwise specified or indicated on the plans, having a horsepower of 1/3 HP or larger shall be 480 volt, 3 phase, 60 Hertz, totally enclosed, non-ventilated, continuous duty rated, squirrel cage induction motor, service factor 1.15.

Motor horsepower shall be as shown on the drawings. Where motors are supplied as an integral part of another item, the motors shall be of a NEMA design and speed compatible with that item.

Where alternate equipment is provided, actual motor horsepower shall be at least 115 percent of the driven load.

C.8 Panelboards

Provide and install all surface mounted panelboards where shown on the drawings. Cabinet mounted panel boards shall be mounted as shown on the drawing. Construction shall be as follows:

(1) Cabinets. Panel shall be dead front type and enclosed in a code gauge galvanized sheet steel cabinet complete with hinged door, lock and two keys, finished in ANSI 61 Light Gray enamel paint, with circuit directory filled out in type and with all exposed metal surfaces prime coated and factory painted. All locks shall be keyed alike. Panel boards mounted within equipment rooms or cabinets shall be NEMA 12 rated. Panel boards mounted in outdoor locations or wet environments shall be NEMA 4X rated stainless steel.

Cabinets shall be of sufficient size to provide gutter space no less than that required by the Underwriter's Laboratories and in no case less than 4 inches.

(2) Mains. Branch circuits shall be changeable without additional machining, drilling or tapping. Branch circuit connections shall provide sequence phasing, with connections permanently identified on the face of the front of the panel interior.

Mains shall be equipped with automatic circuit breakers for branch circuit protection and shall have ratings as indicated. All single pole branches shall be rated 20 ampere, unless indicated otherwise.

Buses shall be rigid copper or copper alloy, installed to provide consecutive phasing. Solid neutral bus shall have solderless connectors, shall be insulated from the cabinet and shall have an ampacity equal to the ampacity of the phase buses. Equipment grounding bus shall be bonded to the cabinet, shall have solderless connectors and a main lug. All copper parts shall be plated to prevent corrosion.

(3) Branches. Circuit breakers shall be of the indicating type, providing distinctive "on", "off", and "tripped" positions of the operating handle. All multi-pole breakers shall be so designed that an overload in any one pole automatically causes all poles to open. Multi-pole breakers shall have a single operating handle. Single pole 15 and 20 ampere branch breakers shall be UL listed for switching duty.

Breakers shall be thermal magnetic type having inverse time delay thermal trip on overloads and instantaneous magnetic trip on short circuit. Circuit breakers shall be quick-break, quick-make on manual, as well as automatic operation. Each circuit breaker shall be independently removable without disturbing adjacent units or other bus connections and

shall be fastened to the main bus bars with a bolt-on connection. All copper parts shall be plated to prevent corrosion.

All 100 ampere frame breakers shall have an interrupting rating of 10,000 amperes A.C. All larger frame size breakers shall have an interrupting rating of 22,000 amperes.

All panelboards shall be factory assembled, UL listed, Type NQOB as manufactured by Cutler-Hammer, Square D, Westinghouse, General Electric, or approved equal.

C.9 Dry Type Transformers

Furnish dry type transformers suitable for indoor mounting in the quantity, voltage, phase, KVA rating, and method of mounting as shown on the drawings. Transformers shall be UL 1561 listed and labeled "Suitable for non-sinusoidal current loads" with a K factor not to exceed a rating of K-30.

Transformers shall be Class AA. The temperature rating shall rise above ambient, as listed below. Primary taps shall be as listed below.

Below Normal	Above Normal	Temp. Below Rise	
Single phase less than 25 kva	Two 5 percent	115°C	
Single phase 25 kva and larger	Four 2 1/2 percent	Two 2 1/2 percent	80°C

Provide transformers with electrostatic shields between the primary and secondary windings as shown on the plans.

Transformers shall have a rated sound level of 45 decibels or below when measured in accordance with NEMA Standards.

Furnish wall hanger brackets especially designed to accommodate the transformers with all wall mounted transformers.

Transformers mounted in outdoor environments shall be mounted in non-ventilated #316 stainless steel enclosures

Transformers mounted in indoor locations shall be fully ventilated enclosures. Enclosures shall be painted with a rust resisting primer coat and two or more finish coats of paint or enamel. Finish transformers with ANSI 61 Light Gray indoor paint.

Submit manufacturer's data on power/distribution transformers, including certification of transformer performance efficiency at indicated loads, percentage regulation at 100% and 80% power factor, no-load and full-load losses in watts, % impedance at 75 degrees C, hot-

spot and average temperature rise above 40 degrees C ambient, sound level in decibels, and standard published data.

The transformers shall be as manufactured by General Signal Corporation, International Transformer Corporation, Sorgel Electric Corporation, or approved equal.

C.10 Motor Starters Contactors

The new starter contactors shall conform to NEMA Standards and shall be of the size and style as shown on the drawings. All motor starters shall be of the full voltage type with overload relays, auxiliary contacts and all accessories as required by the drawings and specified herein. Furnish motor overload elements to match motors provided in accordance with manufacturer's instructions.

Motor starters shall be 3-pole, 480 volt or 208 volt, full voltage, magnetic type as shown on the drawings. Circuit breakers for motor protection shall be of the adjustable instantaneous type sized for the motor to be connected.

Metering equipment and all accessories shown on the drawings or as required shall be mounted in the switchboard cabinet as shown on the drawings.

An incoming line surge suppression device (SPD) shall be provided and installed on the incoming line of the switchboard cabinet near the incoming line service breaker as shown on the drawings. The SPD shall be a heavy-duty unit with audible alarm, modular design, self test capability, modular design, rated for 160ka for service entrance protection at 480 volt grounded delta. Unit shall comply with UL 1449 3rd edition, 200KAIC rated fusing, less than ½ nanosecond response time and provided with a 5 year warranty. Unit shall be by National Lightning Protection Inc. model Para II 5000 Plus or equal by MCG Electronics, Inc or EFI Electronics.

C.11 Service and Distribution

C.11.1 General

Commercial electric power for operation of the bridge and its auxiliaries will be supplied from We Energies at 480 volts nominal, 3-phase, 3-wire, grounded delta, 60-Hertz. Point of contact is Mr. James Washington, City of Milwaukee, (414) 286-3982.

C.11.2 Service Disconnect

Install one fusible disconnect switch as shown on the plans. Disconnect enclosure shall be NEMA 4X rated stainless steel. Fuses shall be Class K-5 dual element type and sized as shown on the plans.

The utility meter will be provided and installed by the power company. The meter pack shall be provided by the contractor.

C.11.3 Automatic Transfer Switch

Install one 200A, 480V, 3 phase rated automatic transfer switch where shown on the plans. Each contact pole of the transfer switch shall be double break design, with solid silver

cadmium contacts, capable of handling both non-conductive and inductive loads and allow for inrush currents of 20 times the continuous rating. Contact pressure shall be maintained by a coil spring, not a part of the current-carrying path. The ampere rating of the transfer switch shall be sufficient to handle the capacity of the loads being transferred. The transfer switch enclosure shall be NEMA 4X rated and shall conform to the requirements of UL 1008, IEC 947-6-1, NFPA 70, NFPA 99, NFPA 202, NFPA 110, ANSI C33.76 and NEMA ICS10.

C.11.4 Service Grounding

The 480-volt grounded wye power system shall be solidly grounded to the grounding grid assembly at the transformer or utility service metering equipment and to the grounding grid assembly within each pier.

Terminal lugs and the metal framing and enclosures of all electrical equipment such as control panels, control desk, panelboards, motors, and other apparatus shall be bonded to the grounding grid assembly.

Terminals of grounding system shall be solderless type, secured by means of hexagonal head, copper plated steel machine bolts with lock washers. Grounding system conductors shall be continuous unsplined connections between terminal lugs.

Follow requirements for Article 250 of the NEC for equipment and service grounds.

C.11.5 Structure Grounding

Ground cable shall be stranded, soft drawn, insulated copper, conforming to ASTM B3 Class B. Ground cables shall be interconnected or bonded to structural steel or connected ground rods by exothermic welds. Two coats of insulating varnish shall be applied over all exothermic welds and exposed cables.

Thermite welds shall be made with molds, cartridges, and accessories as recommended by the manufacturer of the molds for the items to be welded. Molds and powder shall be furnished by the same manufacturer, and shall be by Cadweld, National Lightning Protection, Approved Lightning Products Co., or approved equal.

Grounding system cable shall be a minimum of 380 pounds/1,000 foot copper unless otherwise indicated. Each strand shall be No. 14 AWG. Strands shall be basket or rope lay, cross sectional area shall be #1/0 AWG minimum. Cable interconnections shall be bolted. Cable terminations shall be on bonding plates, sized 6" x 6" x 1/4".

C.11.6 Ground Resistance

Ground resistance shall have a value of 5 ohms or less after connection to the service equipment and shall be measured with an approved ground tester.

Ground resistance measurements shall be taken as follows:

- (1) The resistance of each individual ground rod shall be measured at the time of installation and before connection to the ground bus. If the resistance is greater than 25 ohms, a second rod shall be driven near the rod being tested.
- (2) The resistance of the ground bus shall be measured, with all rods connected to the bus prior to connection to the service equipment.
- (3) The resistance of the ground bus shall be measured with all rods connected to the bus after connection to the service equipment.

Forward a report of the test to the engineer.

It is preferable that all ground rods have approximately like resistances so that when paralleled all rods will carry very nearly the same current. In those instances, where a wide variance of resistance is encountered, add additional sectional rods to those already installed that have the high resistance.

C.12 Relay Logic Control

C.12.1 General

All analog and digital logic functions required to control, interlock, and coordinate the bridge hydraulic power unit (HPU) control system and associated components shall be performed by control relay ladder logic. equipment.

The control relay equipment shall be installed as shown on the plans or stated herein. This existing control cabinet shall house the control relays and all other associated equipment.

The contractor shall develop their own relay ladder logic based on the provided plans to safely operate the Wells St hydraulic power unit and interface with the existing control desk and exiting control logic.

C.12.2 Cabinet

Furnish cabinets as described later in this special provision.

C.12.3 System Hardware

The system shall be complete with all power supplies, racks, interface modules, fault monitors, and any other internal devices required.

C.12.4 Documentation

The supplier shall furnish Instruction Manuals described under “Operation and Maintenance Manual” in this special provision. In addition, these manuals shall include operation of the equipment, theory of operation, maintenance information, schematics of all cards or units within the system, and point-to-point wiring diagrams.

Provide documentation of the control relay logic, which shall include:

- (1) Ladder logic diagram plans.
- (2) Rung address.
- (3) Contact addresses and English contact description.
- (4) Cross reference of rungs which control contacts.
- (5) Cross reference of contact controlled by each rung.
- (6) English comments before each series of rungs.
- (7) Cross reference to relay numbers in plans.

C.12.5 Factory Tests

Pre-test the relay ladder logic system and PLC at the factory to ensure that all logic functions properly. A test panel shall be provided that simulates the existing control console to derive the control signals and indicators required to simulate span position and bridge operations. Include but not limited to traffic lights, bells, horns, traffic gates, bridge hydraulic pumps and valves, etc.

Before the relay ladder logic system and PLC is sent to the job site, a factory test shall be performed with the hydraulic power unit.

Notify the engineer 30 days prior to the tests so that he can arrange for a witness to these tests.

The supplier's costs (if any) of debugging the schematics both at the shop and on the project site after installation, shall be included as incidental to the contract.

The test shall have a minimum duration of two days and display and discuss the following information:

- (1) Simulate all inputs and outputs. Display these on the computer screen.
- (2) Demonstrate all graphic screens and reports.
- (3) Demonstrate all alarms on system.
- (4) Demonstrate compliance with sequence of operation.
- (5) Demonstrate operation of all computers in project.

C.13 Control Panels.

C.13.1 General

The following general requirements apply to all panels and enclosures. Specific requirements are included later in this special provision with the description of each panel.

Furnish the following panels and enclosures:

- (1) 480V Switchboard Cabinet
- (2) HPU Relay Cabinet

Electrical indicating instruments, unless otherwise specified, shall be of the round face analog type, and shall be designed for semi-flush mounting. Instrument ranges and scales shall be as shown on the plans. Instruments shall be as manufactured by General Electric, Westinghouse, or LFE Corporation.

Push buttons, indicating lights, and non-illuminated selector switches shall be 30.5mm, heavy duty oil tight by Allen Bradley 800T, Square D type K or Cutler Hammer 10250T. Indicating lights shall be a one to four light display with individually controlled lamp and color lenses. Lens colors shall be as shown on the plans. Units shall have internal 120 VAC transformers and each lamp individually controlled. Lamps shall be LED type. Engraving shall be as shown on the plans.

Key switches shall be double pole, double throw spring return or maintained contact type, heavy duty oil tight, as shown on the plans, Cutler Hammer type 10250T or approved equal. Switches shall be keyed to match existing City of Milwaukee key styles currently in use. Key switches shall be keyed to type 'KD1' key.

Toggle switches shall be 3 pole, double throw spring return or maintained contact type as indicated on the plans, 10A minimum at 115 VAC, with a red switch guard. Switch guard shall be red high strength plastic configured such that when closed it returns the toggle switch to the normal position.

All load relays (R166, R170, etc.) shall be 10 ampere, 600 volt rated, Allen Bradley Type P, Square D Type X or Cutler Hammer type M-600 with normally open and normally closed power poles as shown in the plans.

All panels and enclosures shall be of the freestanding type. The construction shall be of steel plate of thickness described in the individual panel specifications and shall consist of a frame of suitably sized, formed structural steel members joined by electrical welding to ensure true surfaces and adequate support for the instruments mounted thereon.

All welds on the exposed surfaces shall be ground smooth. Finished surfaces shall be free from waves, bellies or other imperfections. Exterior surfaces shall be sandblasted, ground smooth, filled, primed, sanded and finished.

All instrument cutouts, mounting studs, and support brackets shall be located accurately. Unless specified otherwise, doors shall be hinged and shall have turned-back edges and additional bracing where required to assure rigidity. Hinges shall be of the piano or concealed type. Door latches shall be of the three-point type to assure tight closing.

Before application of paint, all surfaces shall be carefully cleaned of all dirt, moisture, rust, scale, lubricants and other substances. Lubricants shall be removed by suitable solvents. Rust and scale shall be removed by sandblasting, power sanding, power grinding or power wire brushing.

Exterior finish of NEMA 12 enclosures shall consist of application of suitable primers and two or more finish coats of enamel, as required to provide a smooth, hard and durable finish. The finish color for control panels shall be ANSI 61 Light Gray.

Interior surfaces shall be finished with gloss white lacquer applied over suitable primers.

The supplier shall include six 16-ounce containers of touch-up paint in aerosol cans for each color specified above. Touch-up paint shall be of the same type and color as the finish paint used in the factory applied painting. Complete painting instructions shall accompany the touch-up paint.

Paint films shall be free of sags, checks, blisters, teardrops or fat edges. If any such defects appear, they shall be repaired by and at the expense of the supplier.

Provide interconnecting wiring between all electrical devices mounted in the panels and enclosures. If the devices are to be connected to external equipment, they shall be connected to terminal blocks. Conductors for connection of machine tool relays panel board circuits and other miscellaneous equipment shall be UL listed type THWN MTW. Minimum size shall be No. 14 AWG.

Install all interior wiring neatly and carefully. Terminate at suitable terminal blocks. Make all wire terminations with ring tongue nylon self-insulating wire terminals. Install wire terminals using a high compression indenting crimping tool that assures a full crimp by releasing the terminal only when the crimp is complete. All control and instrument wiring used within the panels shall conform to NEC and NEMA standards and shall be installed and tested at the factory.

Wiring to each control switch shall be individually bundled. Install with a "drop loop" of sufficient length to allow its removal from the panel for maintenance without disconnecting the wiring.

Internal wiring in factory pre-wired electronic system cabinets may be installed according to the manufacturer's standard as to wire size, insulation, and method of termination on internal equipment.

Provide terminal blocks for conductors requiring connection to circuits external to the specified equipment, for internal circuits crossing shipping splits, and where equipment parts replacement and maintenance will be facilitated.

Provide terminal blocks with white marking strips. All terminal blocks shall be rated 600 volts and have strap screw terminals. Standard terminal blocks for 8 AWG and smaller conductors shall be channel mounted screw type in groups of 12 and shall be Square D 9080 GP6, Allen Bradley 1492-CA1, Tyco/Buchanan Series 900 or approved equal. Variations in number of terminal blocks per group shall be as shown in the drawings. Identify individual terminal blocks using the numbering system shown in the plans, using ABB/Enterlec marker-holder catalog number PEBM 0113 084.01 or approved equal.

Provide terminal blocks with corrosion resistant platings on non-ferrous hardware.

Group terminal blocks for easy accessibility unrestricted by interference from structural members and instruments. Provide sufficient space on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block.

Permanently label each terminal block, device, fuse block, terminal, and both ends of each conductor, to coincide with the identification indicated on the manufacturer's wiring diagrams. Terminal blocks and devices already numbered on the plans shall be so numbered on the equipment supplied. Identify mounted electronic components by marking with contrasting colored ink beside the component.

Identify individual conductors by permanent marking sleeves using handheld marking tapes or other computer generated software. The marking shall be done on a sleeve not less than 1/2 inch long. The inside diameter of the sleeve shall be such that it will slip snugly over the insulated wire. Mark each sleeve so that the identification shall be permanent and waterproof. Adhesive type labels are not acceptable.

Provide internal illumination in all panels and enclosures using 18" fluorescent strip fixtures. Install a lighting switch beside the access door inside the panels and enclosures. The control desk will not require internal lighting.

Provide a system of convenience outlets in each panel and enclosure for use with power tools, portable lamps, and other similar equipment. Furnish in each enclosure and the control desk a 120 volt AC circuit to feed the interior lighting, the convenience outlets and the illuminated indicators.

Prepare wiring diagrams on sheets approximately 22 inches by 34 inches. Where interconnecting wiring from different items of equipment or sectional wiring diagrams of the same item of equipment appear on different wiring diagram sheets, all interconnections shall be clearly identified.

Information indicated on the contractor's drawings shall include wiring of the individual panel items as they actually will appear in the panel, contact arrangements of switches, and internal wiring of relays and instruments.

Elementary diagrams shall be cross-referenced to terminal markings on the connection and interconnection diagrams, but need not show complete details of circuits external to the panels. Identify each item of panel mounted equipment indicated on the diagrams by item number and name.

Factory test all control panels for circuit continuity and operation.

After switchboard and HPU control cabinets are fabrication and before installation, storage shall be in an enclosed heated and air conditioned space.

Provide laminated phenolic nameplates on the panel faces for all instruments and devices mounted on the panel faces, except where the instruments or devices are themselves provided with a service engraving. Attach phenolic nameplates to the panels with double-sided adhesive tape.

All nameplates shall be WHITE with BLACK engraved lettering unless specified otherwise.

C.13.2 Wells St. Main Control Console

Modify the existing control panel as shown on the plans.

Mount the span control switches and other control devices within the body of each console. Mount the indicating lights for each operation inside or adjacent to the control device governing that operation as indicated.

(1) Indicating Lights Functions to be indicated, and the color of the caps for such indication shall be as shown on the plans. Each indicating light shall be as shown on layout. Each lens shall be provided with an engraved legend, as indicated on the plans, which shall be readily visible when the lamp is energized. Each indicating light shall be similar to type shown and it shall be suitable for mounting on the desk top provided.

C.13.3 HPU Relay Cabinet.

The Relay cabinet shall be of neat, substantial construction, arranged as shown on the plans. It shall be fabricated from not less than No. 12 gauge stainless steel properly formed, and suitable reinforced by steel angles to provide adequate strength. The door shall be 12 gauge stainless steel. The cabinet shall be Hoffman Engineering Co. catalog number A-726018SSFSDN4 with back panel or equal by Hammond Industries. The general arrangement may be varied to fit specific equipment used. The cabinet dimensions shall not be exceeded. The cabinet shall have a nameplate attached to the left hand door. Nameplates shall be not less than 1 inch high and shall be attached with stainless steel screws. Cabinet shall be mounted where shown on the plans and secures to the support shelf bracket using $\frac{3}{4}$ " stainless steel bolts and hardware.

Factory test the Relay cabinet for circuit continuity and operation with associated equipment prior to shipment to the job site.

C.13.4 480V Switchboard Cabinet

The 480 volt switchboard cabinet shall be of neat, substantial construction, arranged as shown on the plans. It shall be fabricated from not less than No. 12 gauge stainless steel metal properly formed, and suitable reinforced by steel angles to provide adequate strength. The doors shall be 12 gauge stainless steel. The cabinet shall be provided with flange mounted disconnect switch. The general arrangement may be varied to fit specific equipment used. The cabinet dimensions shall not be exceeded. The cabinet shall have a nameplate attached to the left hand door. Nameplates shall be not less than one inch high and shall be attached with stainless steel screws. Cabinet shall be mounted where shown on the plans and secured to the support shelf bracket using $\frac{3}{4}$ " stainless steel bolts and hardware.

Factory test the 480 volt switchboard cabinet for circuit continuity and operation with associated equipment prior to shipment to the job site.

C.13.5 Testing

Pre-test the complete electrical control system at the system integrators location. Testing shall include the control console, HPU Relay cabinet and Switchboard cabinet. Make provisions to simulate the operation of the control system by simulating the inputs and outputs that will be performed.

External field devices such as limit switches, traffic gates etc., shall be simulated using a test panel capable of being switched to indicate different switch positions. Outputs to field devices shall be simulated using light panels.

Notify the engineer at least 30 days prior to the test so that he can arrange to witness the test.

The System Integrator's cost (if any) of debugging the control system shall be included in the contract.

C.14 Operation and Maintenance Manual

C.14.1 General

Furnish 6 bound copies of loose-leaf operation and maintenance manuals. The contents shall be bound into the manual between rigid plastic or cloth binding covers. Provide as many binders as required. Binders shall not be thicker than 3.5". The operation and maintenance manual shall be approximately 9 inches by 12 inches, and the diagram manual large enough to contain the drawings without excessive folding so that they may be easily opened. The manual shall be neatly entitled with a descriptive title, the name of the project, the location, year of installation, owner, supplier and engineer. Copies of drawings shall be in black on white background and shall be easily legible. The arrangements of the manual, the method of binding, materials to be included, and the composite text shall all be reviewed and approved by the engineer.

C.14.2 Contents

The manual shall contain the following contents:

- (1) Table of Contents and tabbed dividers for each section.
- (2) Operator's Instructions, which shall cover in full the step-by-step sequence of operation of the bridge and its auxiliaries, and shall note all precautions required for correct operation. Complete instructions for the following shall be included.
 - a. Selection of the power supply.
 - b. Normal operation of the span on commercial power source.
- (3) Detailed maintenance instructions for adjusting, lubricating, trouble shooting, and operating all of the electrical equipment, including manufacturer's recommended preventative maintenance lubrication schedule.

- (4) A set of descriptive leaflets, bulletins, and drawings covering all items of equipment and apparatus made a part of the completed bridge operation and control. The catalog number of each piece, to be used in case it becomes necessary to order replacement parts from the manufacturer. This information shall be furnished for all electrical equipment such as motors, switches, circuit breakers, relays, cables, etc.
- (5) Copies of all warranties and guarantees on equipment supplied to the project.
- (6) The complete spare parts list.
- (7) All schematics and wiring diagrams.
- (8) All submitted shop drawings.
- (9) Drawings of the control desk, 480 volt switchboard cabinet, and HPU relay cabinet. The drawings shall be legible reduced size photostatic copies and corrected to show the work as constructed.
- (10) Drawings of the conduit layout and installation. The drawings shall be legible reduced size photostatic copies and corrected to show the work as constructed.
- (11) A schedule of all electrical apparatus.
- (12) Hard and soft copies of PLC programs.
- (13) Hard and soft copies of control screens.
- (14) A backup copy of the program on disk, IC chip, or other media suitable for loading directly into the PLC shall be provided to Owner.

C.15 Training

Provide and conduct training sessions consisting of the following:

Bridge operators shall be fully trained on operation of the bridge. Provide 16 hours of training. Training shall be scheduled three weeks in advance with the owner and the contractor.

Maintenance personnel shall be fully trained on the maintenance aspects of the relay and PLC control system. Provide 16 hours of training. Training shall be conducted by qualified manufactures representatives for each session. Training shall be scheduled three weeks in advance with the owner and the contractor.

C.16 Field Tests

C.16.1 Preliminary Checkout Period

Arrange for and provide all the necessary field tests, as indicated herein and as directed by the engineer, to demonstrate that the entire electrical system is in proper working order and is in accordance with the plans and specifications.

The contractor shall be responsible for operation and maintenance, including all costs thereof, for systems or equipment temporarily placed in operation for testing and adjusting purposes or for the convenience or necessity of the contractor, prior to final acceptance by the engineer.

The contractor shall instruct the bridge operating personnel in the operation of equipment during test runs and prior to acceptance. This training session shall be videotaped and given to the department and to the city at the completion of the training session.

C.16.2 Manufacturer Representatives

Appropriate representatives of the bridge electrical control equipment shall arrange to be on site.

These representatives shall be capable of making adjustments to the equipment, of locating faults or defects and correcting them if possible, and of obtaining from the manufacturers without delay, new parts for replacement of apparatus which, in the opinion of the engineer, do not perform satisfactorily.

C.16.3 Operational Testing Period

After the span is operating to the satisfaction of the engineer, the contractor and its manufacturers' representatives, an operational test period of not less than one week shall begin, during which time all aspects of the span control system will be tested and observed by the engineer. During this period, the contractor shall make any repairs necessary as a result of equipment failure due to faulty equipment or workmanship. Should preliminary checks or operational tests show that any piece of equipment furnished by the contractor, in the judgment of the engineer, is defective or functions improperly, such adjustments and/or replacements shall be made by the contractor as to make the installation completely acceptable to the engineer, and at no extra cost to the department.

The test shall test all hardware and software to confirm compliance with requirements. Report test results in writing.

- (1) Operate all inputs and outputs. Display these on a computer screen.
- (2) Demonstrate all graphic screens and reports.
- (3) Demonstrate all alarms on system.
- (4) Demonstrate bridge operation using only input to the PLC.
- (5) Demonstrate error free communication over all networks and interfaces.
- (6) Demonstrate power failure operation of PLC.

C.17 Sequence of Normal Operation

The span shall normally be operated using the commercial electric power source. The span normally will be retained in the seated, closed position. The sequence of normal operation shall be as follows:

Operating Procedure (Local)

a. Preliminary Switch Settings

- (1) Check supply voltage. Voltage should always be within 5% of 480V line-to-line.
- (2) Verify the “Pump Select” control switch in the “BOTH” position. Placing the control switch in either Pump A or Pump B positions will operate the span at the half speed increasing the operating time to raise and lower the span.

b. To Open Span

- (1) Three distinct blasts from vessel signifies that a bridge opening is required.
- (2) Turn “Bridge Control” key switch to the “On” position.
- (3) Activate the traffic signals by turning “Traffic Signals” control switch to “ON”. This will turn on the warning bells and begin flashing the traffic signals.
- (4) Signal vessel with the “Horn” pushbutton if the span is to be opened immediately, or with four distinct blasts if a delay is necessary due to a traffic jam, accident, or other causes.
- (5) When on-coming traffic has stopped, lower both on-coming gates by turning and holding the NE and SW “Traffic Gate” control switches to the “Lower” position.
- (6) When on-coming traffic gates are lowered and it is observed that the Span is clear of Off-Going traffic and pedestrians then lower both off-going gates by turning and holding the SE and NW “Traffic Gate” control switches to the “Lower” position.

Observe the indicating lights as follows:

<u>Lamps</u>	<u>Color</u>	<u>Indication</u>
Traffic Signals	Red	Signals set against traffic
Traffic Gates	Red	Gates Closed
Span	Green	Spans full seated

- (7) Observe that no vehicles or pedestrians are near the movable span. Turn the “Pump Control” switch to the “ON” position to start the hydraulic pump motors.

The “Green” Pump Run light will go on, indicating that both hydraulic pump motors have started. Once the pump motors are running, move the bridge control “Joy Stick” from the “Stop” position to the “Slow Raise” position to begin moving the span. Observe the four “Span Seated” lights go off and the amber “Near Closed” light comes on.

At approximately 18 inches above the seated position, observe the amber “Near Closed” light goes off. At this position, the “Joy Stick” can be placed to the “Fast Raise” position increasing the operating speed of the bridge. Placing the “Joy Stick” in the “Fast Raise” position before a height of 18 inches will not place the span in the faster speed of operation until the span has reached and passed the elevation of 18 inches above fully seated.

While the span is raising, observe the four lift cylinder position indicators to monitor the lift height of each cylinder. During operation, should the difference between any of the four cylinders exceed 3 inches, the Skew Warning light will illuminate on the control desk to alert the operator of an impending skew condition. If the difference should exceed 4 inches, the span operation will automatically stop and the Red “Skew Shutdown” light will come on. Follow the skew adjustment instructions listed on the control desk before continuing the bridge operation.

Observe the indicating lights, after bridge is moving, as follows:

<u>Lamps</u>	<u>Color</u>	<u>Indication</u>
Traffic Signals	Red	Signals are set against traffic
Traffic Gates	Red	Traffic Gates are lowered
Joy Stick	Red	Span Raising
Span	None	Span between “Near Closed” and “Near Open” positions

(8) As the span approaches about 11’-6”, as observed on the “Lift Cylinder Position Indicator” and the amber colored “Near-Open” indicating light, the span will automatically slow from the normal high speed mode and continue at the slow speed until the span reaches the full open position of 13.3 feet. The span will automatically stop when the span reaches the full open position.

Observe the indicating lights, after bridge is stopped, as follows:

<u>Lamps</u>	<u>Color</u>	<u>Indication</u>
Traffic Signals	Red	Signals are set against traffic
Traffic Gates	Red	Traffic Gates are lowered
Joy Stick	None	Span not moving
Span	Red	Span fully open

c. To Close Span:

(1) After confirming that the vessel has cleared the span and no vessels are approaching the span for passage through the opening, sound four short warning blasts, denoting the closing of the spans.

(2) Turn the “Main Pump” off by turning the “Pump Select” switch to the “Off” position. Place the “Joy Stick” to the “Slow Lower” position. Observe the span is beginning to lower and the red “Open” goes off and the amber “Near Open” light comes on. When the amber “Near Open” light goes off, place the “Joy Stick” in the Fast Lower” position.

While the span is lowering, observe the four lift cylinder position indicators to monitor the lift height of each cylinder. During operation, should the difference between any of the four cylinders exceed 3 inches, the Skew Warning light will illuminate on the control desk to alert the operator of an impending skew condition. If the difference should exceed 4 inches, the span operation will automatically stop and the Red “Skew Shutdown” light will come on. Follow the skew adjustment instructions listed on the control desk before continuing the bridge operation.

When each span reaches about 18 inches above seat, the span will automatically slow to the “slow speed”. The spans will continue at this speed until each span is fully seated.

Observe the indicating lights as follows:

<u>Lamps</u>	<u>Color</u>	<u>Indication</u>
Traffic Signals	Red	Signals are set against traffic
Traffic Gates	Red	Traffic gates are lowered
Joy Stick	None	Spans not moving
Span	Green	Spans seated

(3) Visually observe that the bridge span is down and that no pedestrians are near the traffic gates. Raise the traffic gates by turning the NW and SE traffic gate control switches to the “Raise” position, then turn the SW and NE traffic gate control switches to the “Raise” position. Limit switches will automatically stop the gates at the open positions. As an option, the “All Gates Raise” push button can be pushed and all four traffic gates will raise at the same time.

(4) When all traffic gates are at the open limits, set the Traffic Signal switch to the “Off” position. The warning bells will go off. Observe the indicating lights as follows:

<u>Lamps</u>	<u>Color</u>	<u>Indication</u>
Traffic Signals	Green	Signals are set allow traffic
Traffic Gates	Green	Traffic gates are raised
Span	Green	Spans seated

(5) The “Bridge Control” key switch should now be turned “Off”. This key operated switch will prevent unauthorized tampering with the operation of the bridge and its auxiliaries. Remove the key from the key switch if the bridge is to be unattended for any period of time.

C.18 Spare Parts

Furnish the following spare parts:

- (1) One circuit breaker of each kind and size installed in the panelboards.
- (2) Control relays as shown on plans with a minimum of one contact block with 4 contacts installed on the relays.
- (3) A quantity of 30% (3 minimum) of the total for each size and type of thermal overload relay installed.
- (4) For the control desk lights:
 - A. 12 indicating lamps for each type installed
 - B. 1 color cap of each color and legend
- (5) One each of each type circuit card or module containing solid state devices. If more than ten cards or units of a type are provided, two spares shall be supplied.
- (6) One complete set of fuses.

Provide spare parts in sealed, uniform-sized cartons, with typed and clearly varnished labels to indicate their contents. Provide a directory of permanent type describing the parts. The directory shall state the name of each part, the manufacturer's number therefore, and the rating of the device for which the part is a spare. The spare parts shall also be marked to correspond with their respective item numbers as indicated on the elementary wiring diagram. Each circuit card requiring adjustments shall be adjusted at the bridge prior to final delivery to the department. Spare parts shall be delivered to the City of Milwaukee or at a location designated by the City of Milwaukee.

C.19 Painting

Exposed metal parts of the electrical equipment installation attached to the steel work of the bridge, such as raceways, boxes, and their accessories, shall be hot-dipped galvanized and shall be painted the same color as the steel work. Interior metal parts shall be primed and painted to match surrounding surfaces.

C.20 Guarantee

The contractor shall be responsible for the proper performance in part and as a whole of the electrical equipment provided for the operation of the lift spans and related parts for a period of one year after the completion of the operational testing period. During the first year of operation, the contractor shall correct at his own expense any difficulties in the operation which may arise as the result of defects of material, equipment and manufacture. Responsibility for such correction shall include the repair, readjustment and replacement not

only of such defective parts, but other parts which may have been damaged thereby. The Owner reserves the right to correct any such defects, and the contractor shall pay the cost thereof. The contractor shall give a written guarantee satisfactory to the Owner to insure the carrying out of the obligations.

D Measurement

D.1 Bridge Electrical Work

The department will measure Bridge Electrical Work as a single lump sum unit, acceptably completed. Spare electrical parts are excluded.

E Payment.

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.505	Bridge Electrical Work	LS

Payment is full compensation for removing and disposing select existing electrical equipment; for furnishing and installing the complete system as shown on the plans and as specified, ready for operation; for operation and maintenance manuals; and for furnishing all shop drawings, materials, labor, tools, equipment, incidentals and services (including control system vendor services) necessary to achieve a complete and acceptable installation.

Submit to the engineer for evaluation a full and complete breakdown of all costs under this item. The engineer has full authority to revise the breakdown, to suit his/her judgment, and make the various tasks more in conformity with the adjudged true values. The contractor agrees the detailed breakdown shall not be effective until it has been approved by the engineer.

Progress billing payments will be based upon the approved breakdown. Progress payments for Span Guides shall be made in accordance with the department, and the department's standard payment practices and in the following manner:

- (1) Upon completion and acceptance by the department of all shop detail drawings, the contractor will be paid 5% of the item bid price.
- (2) Upon completion and acceptance by the department of shop fabrication, shop inspection, shop testing, delivery and storage of materials, the contractor will be paid 35% of the item bid price
- (3) Upon installation completion and acceptance by the department, the contractor will be paid 20% of the item bid price.
- (4) Upon completion and acceptance by the department of the inspection and field testing the contractor will be paid 30% of the item bid price.

(5) Upon completion of training and receipt and acceptance by the department of approved Operating and Maintenance Manuals the contractor will be paid the remaining 10% of the item bid price.

66. Packaged Engine Generator, Item SPV.0105.506; and Generator Mechanical Work, Item SPV.0105.507.

A Description

A.1 Related Documents

Drawings and general provisions of the contract, including general and supplementary conditions apply to this section.

A.2 Summary

This section includes packaged gas-engine generator sets with the following features and accessories:

- Battery charger.
- Engine-generator set.
- Muffler.
- Exhaust piping, metal thimble, and rain cap external to set.
- Remote annunciator.
- Remote stop switch.
- Starting battery.
- Remote air intake motorized combination louver/damper external to set
- Remote ducted air exhaust motorized combination louver/damper external to set
- Natural gas supply piping, valves, and connections external to set

Related Sections include the following:

- Bridge Electrical Work "Automatic Transfer Switch" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine-generator sets.

A.3 Definitions

Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

Steady-State Voltage Modulation: The uniform cyclical variation of voltage within the operational bandwidth, expressed in Hertz or cycles per second.

A.4 Submittals

Product Data: Include the following:

- Data on features, components, accessories ratings, and performance.
- Time-current characteristic curves for generator protective device.

Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

- Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
- Design Calculations: Calculate requirements for selecting vibration isolators restraints and for designing vibration isolation bases.
- Design calculations: Provide a report on generator sizing indicating ability to start and run loads with any spare capacity indicated at the criteria specified.
- Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
- Wiring Diagrams: Power, signal, and control wiring.

Qualification Data: For manufacturer.

Certified summary of prototype-unit test report.

Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.

Certified Summary of Performance Tests: Demonstrate compliance with specified requirement to meet performance criteria for sensitive loads.

Test Reports:

- Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
- Report of sound generation.
- Report of exhaust emissions showing compliance with applicable regulations.
- Field quality-control test reports.

Certification of Torsional Vibration Compatibility: Comply with NFPA 110.

Operation and Maintenance Data: For packaged engine generators to include in, operation, and maintenance manuals. include the following:

- List of tools and replacement items recommended to be stored at the project for ready access. Include part and drawing numbers, current unit prices, and source of supply.

Warranty: Special warranty specified in this section.

A.5 Quality Assurance

Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this project.

- **Maintenance Proximity:** Not more than two hours' normal travel time from Installer's place of business to Project site.
- **Manufacturer's Responsibility:** Preparation of data for vibration isolators of engine skid mounts, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

Manufacturer Qualifications: A qualified manufacturer. Maintain, within 200 miles (160 km) of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

- **Testing Agency's Field Supervisor:** Person currently certified by the International Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.

Product Options: Drawings indicate size, profiles, and dimensional requirements of packaged generator sets and are based on the specific system indicated.

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with NFPA 37.

Comply with NFPA 70.

Engine Exhaust Emissions: Comply with applicable state and local government requirements.

Noise Emission: Comply with applicable state and local government requirements.

A.6 Coordination

Coordinate size and location of existing concrete house keeping pad. Extend base if required for new generator.

A.7 Warranty

Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

Warranty Period: Five years from date of Substantial Completion.

A.8 Extra Materials

Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- Fuses: One for every 10 of each type and rating, but not less than one of each.
- Indicator Lamps: Two for every six of each type used, but not less than two of each.
- Filters: One set each of lubricating oil, fuel, and combustion-air filters.

B. Materials

B.1 Manufacturers

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- Caterpillar; Engine Div.
- Generac Power Systems, Inc.
- Kohler Co; Generator Division
- Onan Corp./Cummins Power Generation; Industrial Business Group
- Approved Equal

B.2 Engine-Generator Set

Packaged engine-generator set shall be a coordinated assembly of compatible components.

Output Connections: Three phase, three wire.

Safety Standard: Comply with ASME B15.1.

Nameplates: Each major system component shall be equipped with a nameplate to identify manufacturer's name and address, and model and serial number of component.

Mounting Frame: Adequate strength and rigidity to maintain alignment of mounted components without depending on concrete foundation. Mounting frame shall be free from sharp edges and corners and shall have lifting attachments arranged for lifting with slings without damaging components.

B.3 Generator-Set Performance

Steady-State Voltage Operational Bandwidth: 4 percent of rated output voltage from no load to full load.

Steady-State Voltage Modulation Frequency: Less than 1 Hz.

Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.

Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.

Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.

Transient Frequency Performance: Less than 5 percent variation for a 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.

Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. The telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.

Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, the system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.

Start Time: Comply with NFPA 110, Type 10, system requirements.

B.4 Service Conditions

Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

- Ambient Temperature: 5 to 40 deg C
- Relative Humidity: 0 to 95 percent.
- Altitude: Sea level to 1000 feet (300 m).

B.5 Engine

Fuel: Natural gas

Rated Engine Speed: 1800 rpm.

Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).

Lubrication System: The following items are mounted on engine or skid:

- Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
- Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.

- Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

Engine Fuel System:

- Natural Gas:
 - a. Carburetor
 - b. Secondary Gas Regulator
 - c. Fuel-Shutoff Solenoid Valve
 - d. Flexible Fuel Connector

B.6 Engine Cooling System

Description: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.

Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.

Cooling System Exhaust Duct: Cooling exhaust air to be ducted to the motorized exhaust louver/damper.

- Comply with NFPA 90A
- Galvanized Steel Ductwork: ASTM A527 with zinc coating confirming to ASTM A525, coating designation G90
- Hangers and Supports (including fasteners, anchors, rods, straps, trim and angles): Matching materials of ductwork furnished
- Provide access door in ductwork for actuator and louver/damper maintenance

B.7 Fuel Supply System

Comply with NFPA 54.

Fuel Supply Connection: Inlet for two inch (2") gas supply line connection to existing utility-furnished gas regulator/meter located outside of the Equipment Room.

- Pipe and Fittings:
 - a. Provide pipe, fittings, and flanges including gaskets, bolts, nuts, washers and other pressure containing parts necessary for the complete installation of natural gas piping.
 - b. Nipples shall be extra-heavy shoulder type. No close nipples shall be used. All nipples shall have designation mark of the manufacturer and shall conform to ASTM pipe specifications for system served.
 - c. Unions shall be malleable iron, threaded, conforming to ANSI B16.39.
 - d. Gas piping located in areas with excessive moisture shall be wrapped and coated as per Utility requirements.

- e. Pipe and Fitting Schedule:
 - 1) Gas Pressure Range Up to 1/2 psig
 - a) Pipe: Black Steel ASTM A 53, Gr. B or ASTM A 120, Schedule 40.
 - b) Fittings: Up to 4 inches – Threaded, Using Malleable, Iron, ANSI B16.3, 150 lb. Class
 - 2) Gas Pressure Range Above 1/2 psig up to 3 psig
 - a) Pipe: Black Steel, ASTM A 53, Gr. B or ASTM A 120, Schedule 40.
 - b) Fittings: Up to 3 inches – Threaded, Using Malleable Iron, ANSI B16.3, 150 lb. Class
- Valves
 - a. Unless otherwise shown on the Contract Drawings, provide valves of same size as upstream pipe size.
 - b. Each type of valve shall be the product of one manufacturer, and shall be AGA certified.
 - c. Valves shall be of one of the following manufacturers, or approved equal:
 - 1) Plug Valves
 - a) Walworth Co.
 - b) Homestead Valves, Div. Olson Technologies
 - 2) Gas Cocks
 - a) Conbraco Industries, Inc.
 - b) Matco Products, Inc.
 - d. Plug Valves
 - 1) Valves, 2 1/2 inches and larger, shall be lubricated, iron body, 125 psi w.o.g., flanged ends, wrench operated type.
 - 2) Valves, 2 inches and 1 1/2 inches, shall be lubricated, iron body, 125 psi w.o.g., threaded ends, wrench operated type.
 - e. Gas Cocks
 - 1) Valves, 1 1/4 inches and smaller, shall be lever handle or tee head, bronze, straightway, 150 psi w.o.g., threaded ends type.
- Pipe Identification
 - a. Adhesive Bands
 - 1) Provide approved adhesive bands in sets of two, one identifying the piping system type and the second, the direction of flow. Sets shall be provided in quantities sufficient to accommodate the installation requirements of 3.5 B of this section.
 - 2) For 2 1/2-inch or smaller pipe, the letters and the arrow shall be not less than one inch high. Bands shall be in colors and shall conform to ANSI A13.1.
 - 3) Adhesive bands shall be W.H. Brady Co. "Quik-Label", or approved equal.
- Pipe Hangers and Support
 - a. Provide all pipe hangers and supports adequate to support and guide the piping, satisfy structural requirements and maintain proper clearances with respect to adjacent piping, equipment and structures.
 - b. Provide hangers and supports, with beam clamps, restraints, supplemental steel, inserts, fish plates, mounting devices, etc., to support piping in alignment without sagging or interference, and to permit free expansion and contraction.

- c. Keep the different types of hangers to a minimum and provide hangers that are neat, without complicated bolting and with the number of parts of each hanger and its anchor kept to a minimum.
- d. Suspend hangers from beam clamps, brackets, fish plates, inserts or by other approved means. Furnish and install any additional miscellaneous steel supports between building framing members as may be required.
- e. Support main vertical piping with steel riser clamps.
- f. When loads between supports can be expected to cause a sag in the pipe in excess of ¼ inch, reduce spacing as necessary to stay within such a limit.
- g. Provide and install on all supporting rods, a forged steel turnbuckle with top and bottom lockouts having a vertical adjustment of 6 inches, minimum.
- h. All pipe hangers, rods, supports, clamps, etc. shall be furnished with a finish of black protective paint.
- i. Do not hang piping from other piping and ductwork.
- j. Unless otherwise specifically approved, hanger rod size and spacing shall be within the following limits:
 - 1) NPS 1-¼" to 2" – maximum hanger spacing at 10 ft. o.c.; minimum rod size of 3/8".
- k. Hangers and supports shall be manufactured by Grinnell Corp., Carpenter & Patterson Inc., Michigan Hanger Co Inc., or approved equal.

The connecting gas line to the inlet from the regulator and the utility supply shall be sized to deliver and maintain engine gas pressure in the range of 7" to 14" of water-column whenever the engine is in operation across all load levels and at a heating value of at least 905 BTU per standard cubic foot.

Set supplied with factory-equipped secondary regulator as required and fuel shutoff valve.

B.8 Engine Exhaust System

Muffler: Residential type, sized as recommended by engine manufacturer; sound level measured at a distance of 10 feet (3 m) from exhaust discharge shall be 95 dBA or less.

Condensate Drain for Muffler: Schedule 40, black steel pipe connected to muffler drain outlet through a petcock.

Connection from Engine to Exhaust System: Flexible section of corrugated stainless-steel pipe.

Connection from Exhaust Pipe to Muffler: Stainless-steel expansion joint with liner.

Exhaust Piping External to Engine: ASTM A 53/A 53M, Schedule 40, welded, black steel, with welded joints and fittings.

Exhaust Pipe through Exterior Wall: Metal thimble 6 inches larger than the exhaust line. The exhaust line shall be the size recommended by the engine manufacturer. Furnish rain hood/cap over exhaust pipe end.

The exhaust system shall be provided with all necessary piping, clamps, silencer, wall flashings and other items required for proper installation.

The exhaust system shall be completely insulated from the flexible connection at the engine and silencer to the exhaust outlet outside the Operator House. Insulation shall be removable blanket type meeting the requirements of UL2200. The completed insulation system shall be wrapped with stainless steel sheets held in place with stainless steel bands. Sheets shall have 1" overlap and be prevented from slipping by installing (3) #8x ½ long stainless steel sheet metal screws equally spaced around the circumference at each joint.

B.9 Combustion-Air Intake

Description: Standard-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

B.10 Wall Louvers

Furnish and install where shown on the plans, automatic electrically operated, intake and exhaust combination louver/dampers in existing wall openings of the Equipment Room. Combination louver /damper to including the following:

- Frame: Heavy gauge extruded 6063-T5 aluminum, 4 in. x 0.125 in. nominal wall thickness
- Blades: Drainable design, heavy gauge extruded 6063-T5 aluminum, 0.081 in. nominal wall thickness, positioned at 45° angles on approximately 4 in. centers
- Seals: Dual-durometer extruded vinyl blade seals Compressible stainless steel jamb seals
- Temperature Restrictions: -20 deg. F to +180 deg. F
- Linkage: Side linkage, out of airstream (concealed in frame)
- Bearings: Synthetic sleeve type
- Axles: ½ in. dia. Zinc plated steel
- Construction: Mechanically fastened
- Finish: 2-coat 70% Kynar 500/Hylar 5000 AAMA2605 finish. Color selection to match exterior finish and as approved by the engineer
- Screen: Insect screen 14x18 bronze wire cloth, backed by a screen of 19-gauge wire in ½ in. mesh. Screen contained in a removable frame
- Actuator: Two position - spring return electric actuator sized for the damper size needed. Power to the closed position when generator is not in use. When power supply is removed (or turned off) during generator use, the actuator to fail to the open position by means of a spring. Provide transformer if required.

Louver panels shall be designed to withstand a 25 pound per sq. foot wind-load.

Published performance data to be submitted for approval prior to fabrication and must demonstrate pressure drop and water penetration equal to or less than the basis of design model EAC-401 as manufactured by Greenheck.

B.11 Starting System

Description: 12-V electric, with negative ground and including the following items:

- Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum.
- Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
- Battery: Adequate capacity within ambient temperature to provide specified cranking cycle at least three times without recharging.
- Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
- Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
- Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit shall comply with UL 1236 and include the following features:
 - a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
 - b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
 - c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
 - d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.

B.12 Control and Monitoring

Functional Description: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of the generator set. When mode-selector switch is switched to the on position, the generator set starts. The off position of the same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down the generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down the generator set.

Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration.

- Current and Potential Transformers: Instrument accuracy class.

Indicating and protective devices and controls shall include those required by NFPA 110 for a Level 2 system, and the following:

- AC voltmeter
- AC ammeter
- AC frequency meter
- DC voltmeter (alternator battery charging)
- Engine-coolant temperature gage
- Engine lubricating-oil pressure gage
- Running-time meter
- Ammeter-voltmeter, phase-selector switch(es)
- Generator-voltage adjusting rheostat
- Start-stop switch
- Overspeed shutdown device
- Coolant high-temperature shutdown device
- Coolant low-level shutdown device
- Oil low-pressure shutdown device
- Generator overload

Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.

Connection to Data Link: A separate terminal block, factory wired to Form C dry contacts, for each alarm and status indication is reserved for connections for data-link transmission of indications to remote data terminals.

Common Remote Audible Alarm: Signal the occurrence of any events listed below without differentiating between event types. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset.

- Engine high-temperature shutdown
- Lube-oil low-pressure shutdown
- Engine high-temperature pre-alarm
- Lube-oil low-pressure pre-alarm
- Low coolant level
- Over-crank shutdown
- Coolant low-temperature alarm
- Control switch not in auto position
- Battery-charger malfunction alarm
- Battery low-voltage alarm

Remote Alarm Annunciator: Labeled LED shall identify each alarm event. Common audible signal shall sound for alarm conditions. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

B.13 Generator Overcurrent and Fault Protection

Generator Circuit Breaker: Molded-case, electronic-trip type; 100 percent rated; complying with UL 489.

- Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
- Trip Settings: Matched to generator thermal damage curve as closely as possible.
- Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
- Mounting: Adjacent to or integrated with control and monitoring panel.

Generator Protector: Microprocessor-based unit that continuously monitors current level in each phase of generator output, integrates generator heating effect over time, and predicts when thermal damage of the alternator will occur. When signaled by the protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from the load circuits. Protector shall perform the following functions:

- Initiates a generator overload alarm when the generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms.
- Under single or three-phase fault conditions, regulates the generator to 300 percent of rated full-load current for up to 10 seconds.
- As the overcurrent heating effect on the generator approaches the thermal damage point of the unit, the protector switches the excitation system off, opens the generator disconnect device, and shuts down the generator set.
- Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.

B.14 Generator Exciter, and Voltage Regulator

Comply with NEMA MG 1 and specified performance requirements.

Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

Electrical Insulation: Class H or Class F.

Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.

Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

B.15 Finishes

Components: Manufacturer's standard enamel over corrosion-resistant pretreatment and compatible standard primer.

B.16 Source Quality Control

Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

- Tests: Comply with NFPA 110, Level 1 energy converters in Paragraphs 3.2.1, 3.2.1.1, and 3.2.1.2.
- Generator Tests: Comply with IEEE 115.
- Components and Accessories: Items furnished with installed unit that are not identical to those on tested prototype shall have been factory tested to demonstrate compatibility and reliability.

C Construction

C.1 Examination

Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.

Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.

Proceed with installation only after unsatisfactory conditions have been corrected.

C.2 Concrete Bases

Coordinate size of existing raised concrete pad with generator.

C.3 Installation

Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.

Install packaged engine generators level on concrete base.

Vibration Isolation: Mount packaged engine generators on rubber pads. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

Install cooling-system piping, accessories, hangers and supports, and anchors for complete installation.

- Hanger, support, and anchor devices shall be Comply with requirements below for maximum spacing of supports.
- Install the following pipe attachments:
 - a. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.

- b. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
 - c. Spring hangers to support vertical runs.
- Install hangers for steel piping with the following maximum spacing and minimum rod sizes:
 - a. NPS 1 and Smaller: Maximum span, 7 feet; minimum rod size, 1/4 inch.
 - b. NPS 1-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
 - c. NPS 2 and Larger: Maximum span, 10 feet; minimum rod size, 3/8 inch.
- Support cooling-system piping with pipe hangers spaced horizontally and at each floor vertically.
- Restrain cooling-system piping with cable-type bracing assemblies.
- Extend drain piping from heat exchangers to point of disposition.

Install exhaust-system piping. Extend to point of termination outside structure. Size piping according to manufacturer's written instructions.

- Install condensate drain piping for engine exhaust system. Extend drain piping from low points of exhaust system and from muffler to condensate traps and to point of disposition.
- Support exhaust piping and muffler with pipe hangers spaced a maximum of 20 feet horizontally and at each floor vertically.
- Restrain exhaust piping and mufflers with cable-type bracing assemblies.

Install natural gas piping.

- Install piping as shown on the Contract Drawings and straight and direct as possible, forming right angles or parallel lines with building walls, neatly spaced, with risers plumb and true.
- Avoid tool marks and unnecessary pipe threads. Burrs formed when cutting pipe shall be removed by reaming. Cut all pipe square and smooth; make up all joints to required limits.
- Make changes in pipe size by the use of reducing fittings. Do not use reducing bushings except by approval of the engineer.
- Installed piping shall not interfere with the operation or accessibility of doors or windows; shall not encroach on aisles, passageways and equipment; and shall not interfere with the servicing or maintenance of any equipment. Adjacent pipelines shall be grouped in the same horizontal or vertical plane.
- Make all changes in direction using pipe and fittings, only.
- Make connections to equipment, using flanges or unions.
- Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping or equipment connections are completed.
- Use dielectric fittings where dissimilar metals are joined.
- Install drip-legs in gas piping where shown on the Contract Drawings and where required by the applicable building code.
- Install piping with 1/64 inch per foot downward slope in direction of flow.

Gas pipe joints connection. Make up threaded joints using pipe joint Teflon compound or tape, placed on the male thread only.

Install exhaust ductwork from generator cooling system to exhaust combination louver/damper assembly. Install ductwork and accessories according to SMACNA "HVAC Duct Construction Standards - Metal and Flexible" and ductwork accessory manufacturers' installation recommendations. Connect equipment to ductwork with flexible connectors.

Install air intake/exhaust combination louver/dampers according to manufacturer's installation procedures. Coordinate all trades to ensure that the installation of air intake/exhaust is not in conflict with the work performed by other trades.

Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

C.4 Connections

Drawings indicate general arrangement of piping and specialties. The following are specific connection requirements:

- Install fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.
- Connect cooling-system water supply and drain piping to gas-engine heat exchangers. Install flexible connectors at connections to engine generator and remote radiator.
- Connect fuel piping to engines with a gate valve and union.
 - a. Natural-gas piping, valves, and specialties for gas piping inside the building are specified in 2.7 B of this Section.
- Connect exhaust-system piping to engines.

Ground equipment according to Bridge Electrical Work Specification.

Connect wiring according to Bridge Electrical Work Specification.

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

C.5 Identification

Identify system components according to Electrical Work Specifications.

Pipe Identification

- Affix sets of pipe adhesive bands specified in 2.7 B.3(a) where they can be easily read, with their long dimension parallel to the axis of the pipe, and no more than 40 feet apart on a piping system. At least one set of identifying bands shall be affixed in all occupied and unoccupied rooms as well as in all other spaces, such as hung ceilings or shafts, where piping may be viewed and the identity of the piping system cannot be readily ascertained.

C.6 Field Quality Control

Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections. Report results in writing.

Perform the following field tests and inspections and prepare test reports:

- Perform tests recommended by manufacturer including generator air intake and exhaust combination louver/damper operation.

Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

C.7 Startup Service

Engage a factory-authorized service representative to perform startup service.

Inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

Complete installation and startup checks according to manufacturer's written instructions.

Simulate power failure. Demonstrate the ability to start all loads. Demonstrate proper operation of all air inlets and outlets.

C.8 Demonstration

Engage a factory-authorized service representative to train owner's maintenance personnel to adjust, operate, and maintain packaged engine generators. Provide one 4 hour training session, scheduled in advance with the owner and the contractor.

- Coordinate this training with that for transfer switches.

D Measurement

The department will measure Packaged Engine Generator, completed according to the contract and accepted, as a single complete lump sum unit of work.

The department will measure Generator Mechanical Work, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.506	Packaged Engine Generator	LS
SPV.0105.507	Generator Mechanical Work	LS

Payment is full compensation for Packaged Engine Generator and Generator Mechanical Work including the cost of furnishing all labor, material, equipment, testing, O&M documentation and any incidentals required to complete the work which includes furnishing and installing the motorized generator air intake and ducted cooling exhaust combination louver/dampers, natural gas piping and connections, actuators, valves, manifolds, piping, bolts, shims, supports, remote annunciator panel, and any incidentals required to properly execute and place in complete working order the generator air intake and ducted cooling exhaust combination louver/dampers, and the natural gas supply and connection to the generator according to the plans, specifications, and special provisions.

Submit to the engineer for evaluation a full and complete breakdown of all costs under this item. The engineer has full authority to revise the breakdown, to suit his/her judgment, and make the various tasks more in conformity with the adjudged true values. The contractor agrees the detailed breakdown shall not be effective until it has been approved by the engineer.

Progress billing payments will be based upon the approved breakdown. Progress payments for Span Guides shall be made according to the department's standard payment practices and in the following manner:

- Upon completion and acceptance by the department of all shop detail drawings, the contractor will be paid 5% of the item bid price.
- Upon completion and acceptance by the department of shop fabrication, shop inspection, shop testing, delivery and storage of materials, the contractor will be paid 35% of the item bid price
- Upon installation completion and acceptance by the department, the contractor will be paid 20% of the item bid price.
- Upon completion and acceptance by the department of the inspection and field testing the contractor will be paid 30% of the item bid price.
- Upon completion of training and receipt and acceptance by the department of approved Operating and Maintenance Manuals the contractor will be paid the remaining 10% of the item bid price.

67. Bridge Hydraulic System, Item SPV.0105.508.

A Description

The work under this Section shall consist of furnishing all labor, equipment and materials (including spare parts) as shown on the Plans and specified herein. The work includes designing, supplying, installing, adjusting, galvanizing, painting, lubricating and testing to place in correct, satisfactory operating condition the new bridge hydraulic system for the lift span, including the following:

- Remove existing Hydraulic Power Unit (HPU) from the Utility Room in the Mid-level of the Control House.
- Remove all existing Hydraulic Fluid Lines.
- Remove, rehabilitate, and re-install existing Jacking Cylinder Assemblies.

- Remove existing Jacking Cylinder Supports located above the existing lift span counterweight. Restore mounting areas at the pier walls where these Supports are mounted, and furnish and install new Jacking Cylinder Supports.
- Remove existing Bearing Plates and Lubricated Bronze Plates mounted on the Jacking Girder above the Jacking Cylinder Assemblies. Remove corrosion and restore the tops and bottoms of the lower flange of the Jacking Girder and furnish and install new Bearing Plates and Lubricated Bronze Plates.
- Furnish and install new HPU in the Utility Room.
- Furnish and install new Hydraulic Fluid Lines from the new HPU to the rehabilitated Jacking Cylinders per the Hydraulic Schematic. Included are all Supports, Manifolds, Valves, Switches, other components including all structural modifications necessary to allow passage and support of these features.
- The complete Hydraulic System as described above shall be fully tested as a unit, together with electrical controls, in the Shop as well as in the field at the Bridge Structure. Any deficiencies in material or in performance shall be remedied during construction and during the Warranty Period without cost to the department.

New electrical generator shall be furnished and installed under Bridge Electrical Work.

Coordination is required with other work on the project, including all structural, mechanical, and electrical work done under this and other pay items.

The bridge hydraulic system shall meet the requirements for hydraulic systems, components, and associated elements and hydraulically operated equipment for use in movable bridge operation and control, as described herein.

The bridge hydraulic system consists of the following major components as described above:

<u>MK</u>	<u>Item</u>	<u>Total</u>
HPU	Hydraulic Power Unit	1
---	Hydraulic Piping, Supports and Accessories	1 Lot
---	Hydraulic Jacking Cylinder Assemblies (rehabilitation only) including all new supports and accessories	4

B Materials

B.1 General

All materials shall meet the minimum requirements specified herein or as specified on the plans. The plans and these Special Provisions show equipment schedules listing the minimum design requirements for the new equipment.

All equipment and materials furnished under the items specified herein shall be brand-new. All equipment, materials and workmanship shall be first class in every particular, and shall be manufactured or rehabilitated and installed to the satisfaction of the engineer.

Portions or all of certain recognized industry or association standards or specifications referred to herein as being a requirement of these Special Provisions shall be considered as binding as though reproduced in full herein unless supplemented and/or modified by more stringent requirements of the contract documents. Unless otherwise stated, the referenced standard or specification current as of the date of issuance of these Special Provisions shall be used. The following abbreviations are used herein and on the plans to designate specifications and standards for material and workmanship:

AASHTO	American Association of State Highway and Transportation Officials
AGMA	American Gear Manufacturers Association
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	ASTM International (formerly American Society of Testing Materials)
AWS	American Welding Society
DIN	Deutsches Institut für Normung
JIC	Joint Industrial Council
ISO	International Organization for Standardization
NEMA	National Electrical Manufacturers Association
NFPA	National Fluid Power Association
NLGI	National Lubricating Grease Institute
OSHA	Occupational Safety and Health Act
SAE	SAE International (formerly Society of Automotive Engineers)
SSPC	Steel Structure Painting Council

The design, workmanship and erection of all machinery and hydraulic components shall meet the applicable requirements of AASHTO LRFD Movable Highway Bridge Design Specifications of the latest issue with revisions through 2016, hereinafter referred to as the AASHTO Specifications, except as otherwise specified herein or as shown on the plans.

Hydraulic equipment shall be designed and assembled according to AASHTO Section 7 – Hydraulic Design, except as otherwise noted, including:

- ISO 4413—Hydraulic Fluid Power—General rules relating to systems.
- NFPA/T2.24.1 R1-2000—Hydraulic Fluid Power—Systems standard for stationary industrial machinery—Supplement to ISO 4413:1998—Hydraulic Fluid Power—General rules relating to systems.
- ISO/DIS 4406—Hydraulic Fluid Power— Fluids—Code for defining the level of contamination by solid particles.
- ISO 16889:1999—Hydraulic Fluid Power Filters—Multi-pass method for evaluating filtration performance of a filter element.
- ISO/FDIS 4413—Hydraulic Fluid Power— General rules relating to systems.

Hydraulic power units shall be completely pre-piped, pre-wired, tested, and painted prior to arrival at the job site. Open ports for field piping shall be securely capped with steel plugs. Changes or modifications in the field are not permitted. Should the power units require piping changes they shall be removed from the bridge, modified, and re-tested in the manufacturer's shop.

B.2 Bridge Hydraulic System Supplier and Installer

As part of this item, the contractor shall be required to have a designated Bridge Hydraulic System Supplier and Installer attend the pre-construction conference, be present during testing in the Shop, be present at the site during system installation and testing, and train city and department personnel. Training shall be according to the requirements stated under Operation and Maintenance Manuals, Lubrication Chart, and Training.

B.3 Qualifications

Hydraulic system fabrication, installation and startup shall be performed by a qualified Hydraulic System Designer/Manufacturer. This Bridge Hydraulic System Supplier and Installer shall have had at least ten years of experience in the design, fabrication, and installation of hydraulic systems of this size and type.

Piping and flushing shall be done under the direction of an NFPA Certified Fluid Power Technician with experience on similar systems, who shall oversee the installation crew. Certification number and experience shall be submitted for review and approval. Installation and adjustment of hydraulic components shall be by personnel with demonstrated skill in this type of work.

B.4 Warranty and Quality Control

All manufacturers shall warrant all products and associated hardware to be free of defects in material and workmanship for a period of five years from the date of final acceptance of the completed bridge contract. Final Acceptance shall be according to State of Wisconsin Specifications. Any defect within this period shall be repaired or replaced by the Manufacturer or Vendor, at total cost to the Manufacturer or Vendor, including labor, parts, and transportation.

The contractor shall provide letters to the suppliers with copies to the engineer, identifying the scheduled date of final acceptance of the bridge and therefore the date the warranty shall begin. If the date of final acceptance is extended, it shall be the contractor's responsibility to extend the commencement of the warranties from the suppliers at no cost to the department.

The department reserves the right to receive on demand, at no cost to the department, a test report from an independent laboratory certifying the equipment furnished meets the requirements of these specifications.

The department reserves the right to reject an entire shipment of material covered by this Special Provision if an item or items are found to be defective within a 30-day period following receipt of materials.

B.5 General Requirements

All components of the Bridge Hydraulic System shall be properly sized and selected such that no excessive temperature rise, oscillation or vibration occurs during the operation cycle. The entire cycle shall be smooth regardless of operator command or weather conditions.

B.6 Submittal Requirements

Shop drawing submittals shall be made according to Section 110. The contractor shall submit complete pressure drop calculations based on the equipment proposed to be used by the Hydraulic Supplier to the engineer for review. In addition, complete submittal data for the hydraulic system shall be submitted to the engineer for review during the shop drawing process.

Minimum submittal requirements shall include the following:

- Hydraulic schematic with bill of materials.
- Certified dimensional prints for the hydraulic power unit, its manifolds, reservoir, etc., with all components to scale, plus certified dimensional prints for all separately mounted components.
- HPU layout, dimensions, and component configuration.
- Equipment layout showing clearances between equipment and bridge structure including minimum clearances for servicing and maintenance
- Engineering and performance data of all items supplied, including material specifications, pump efficiencies, component catalog cuts, etc.
- Power unit electrical terminal cabinet, electrical relay cabinet (both furnished separately under Bridge Electrical Work), and HPU panel wiring diagrams. (See requirements for electrical equipment submittals, below.)
- Initial hydraulic system fill and field flushing procedure.
- Hydraulic fluid specifications.
- Assembly drawings for hydraulic power unit and jacking cylinder supports.
- Complete piping layouts and details, including fittings, lengths, supports, clamps, calculations for factors of safety for all hydraulic plumbing, etc.
- Complete system power analysis, including component sizing calculations, pressure drops, and pump efficiency ratings for flow and pressure for normal modes of operation.
- The contractor shall submit shop drawings of all fabricated components of the Bridge Hydraulic System, including power unit structural framing and assembly, reservoir, mechanical actuating components mounted thereon, and jacking cylinder attachments, to the engineer for review and approval prior to fabrication.

- The contractor shall submit shop drawings detailing the dimensions of the supporting structures, the procedure for the alignment of the cylinder supports, and a full installation procedure. The contractor shall submit for approval, in shop drawing format, the method to be used to locate the brackets. All procedures shall be submitted to the engineer for review prior to the start of the work. Support brackets shall be aligned in all directions and dimensions to within 0.050 inches.
- The contractor shall submit shop and field testing procedures including forms to be used for recording test data and a plan for flushing the entire Bridge Hydraulic System at completion of assembly to the engineer for approval. The Bridge Hydraulic System shall not be installed until plan approval is received.

Electrical submittals related to the Bridge Hydraulic System shall include:

- Dimensioned panel layout drawings with all components to scale. All components shall be labeled and referenced to a bill of materials.
- Manufacturer's data sheets for all components (disconnects, switches, timers, fuses, circuit breakers, etc.)
- Schematic drawings showing wire numbers and field wiring.
- Engraving schedule for nameplates.
- Submittal data for each motor shall include horsepower, voltage, amps (full load and locked rotor), motor speed, NEMA frame size, insulation class, temperature rise, service factor, and optional equipment (encoders, thermal switch, space heater, etc.). Provide torque / speed performance graph.

B.7 Operation and Maintenance Manuals, Lubrication Chart, and Training

The contractor shall furnish 6 bound copies of the Operation and Maintenance Manuals giving complete instructions relative to assembly, installation, operation, adjustment, alignment, lubrication, maintenance, disassembly of the new Bridge Hydraulic System. Complete parts lists and assembly drawings shall be provided as part of the Manuals. The materials shall be bound into each manual between rigid plastic or cloth binding covers. The manuals shall be approximately 9 inches by 12 inches, and the diagram manual large enough to contain the drawings without excessive folding so that they may be easily opened. The manuals shall be neatly entitled with a descriptive title, the name of the project, the location, year of installation, owner, supplier/contractor and engineer. Copies of drawings shall be in black on white background and shall be easily legible. The arrangements of the manual, the method of binding, materials to be included, and the composite text shall all be reviewed and approved by the engineer.

Manuals shall be furnished concurrently with working drawings, for review and approval by the engineer.

Maintenance Manuals shall contain descriptive material, catalog cuts with non-pertinent data blocked out, As-Built drawings, spare parts list, troubleshooting techniques and any and all information necessary for the successful and safe operation, troubleshooting and maintenance of the Bridge Hydraulic System and each piece of equipment furnished by the contractor. Bridge Hydraulic System shall be understood to include but not be limited to all

hydraulic equipment, valves, piping, supports, rod cylinders, hydraulic power unit and all other hydraulic equipment for which periodic maintenance and operation is required and/or desirable.

Operating Manuals shall contain written descriptions of the functioning of the Bridge Hydraulic System of the movable bridge, with step-by-step operating instructions for each of these systems and any and all information and directions required for their successful and safe operation.

A lubrication chart showing the location of all components requiring periodic lubrication or maintenance shall be included in the Manuals and shall also be furnished and installed near the hydraulic power unit. This shall include specific procedures for sampling and testing the hydraulic fluid to detect all types of contamination, including hose particles as well as wear metal particles and water, and recommended periods for testing. All procedures are subject to review and approval by the engineer. The mounted lubrication chart shall be 24" x 36" in size, and shall contain permanent black letters on a white background. The chart shall be mounted on a rigid backing, covered with clear, rigid plastic sheeting, shall be weather-proof, and shall be mounted in locations easily visible to bridge personnel stationed at the HPU.

Training with regard to periodic maintenance required, on the basis of the lubrication chart provided, and troubleshooting procedures to be followed in the event of a malfunction, shall be provided on-site to up to four maintenance personnel to be designated by the department. The training session shall include a basic discussion regarding hydraulic operation of the lift span and a detailed discussion of the function and operational characteristics of each component or feature of system provided. The training session shall include demonstration of the lift span in all modes of operation, and of conditions and functions that may occur when the span is at rest. Safety procedures discussed shall include protection of hydraulic components and features, to prevent damage, as well as necessary procedures for the protection of operating and maintenance personnel against injury. A demonstration of manual operation to lower the span using the Instruction Plates provided under Bridge Hydraulic System shall be performed during the training session. Certificates of Completion stating the name of the bridge and the training covered shall be issued to each participant who completes the training.

B.8 Capacities and Speeds

Capacities shown for the materials specified herein are based on an operating time to lift and lower the span of 60 seconds in each direction, using both pairs of motors and pumps, including basic acceleration and deceleration times of 8 seconds to and from full speed, and the following conditions and assumptions. Net load to lift at the jacking cylinders, after counterweight is deducted, is approximately 102,000 lbs. including dead load friction, inertia, rope bending, unbalance, wind load, and ice load. Four existing hydraulic jacking cylinders are to be used to lift the span on this basis. Basic fluid flow and pressure at the jacking cylinders shall be as required to meet the speed and load requirements for lifting the span using the pumps and lowering the span under unbalanced conditions of 45,000 to 60,000 lbs. Total system efficiency shall be determined, based on the equipment selected

for the basic design, including all AASHTO required loads, lift span friction, and all losses beyond the pump from hydraulic components and piping. The bridge hydraulic system shall take all requirements into account in the design of the pumps and electric motors.

All equipment capacities shall be selected on the basis of the two pumps and motors operating at 100% full load capacity. Stainless steel pipe of the sizes indicated shall be used to the greatest extent possible to minimize pressure drop. Hydraulic fluid line sizes shown on the Plans shall not be decreased, and shall be increased if required to improve efficiency. The contractor shall submit calculations to verify the design, using capacities and efficiencies of the equipment proposed by the contractor.

B.9 Coatings

External surfaces of the HPU (including mounted components), piping, and rehabilitated cylinder assemblies, except for machined parts in sliding contact, shall be primed and coated according to the requirements for the structural steel as stated elsewhere in the Special Provisions. Surface preparation and application of coatings shall be according to the coating manufacturer's recommended procedures and the applicable Steel Structures Painting Council (SSPC) Specifications. Final coat paint color(s) shall be as directed by the engineer.

Clean and paint all unfinished surfaces of steel equipment as required by the department using a system listed on the department's master list of preapproved zinc rich three coat paint systems. Submit an outline of painting materials and methods with the shop drawings. Coat according to Section 517 of the Standard Specifications and the requirements herein.

Steel weldments and steel components included in Bridge Hydraulic Work are designated to be hot dipped galvanized and painted with the preapproved 2 coat system. Apply all prime and final paint coats in the shop.

Before painting unfinished surfaces in the shop, remove all burrs, chips, rust, scale, sand, grease and other foreign material by blasting, wire brushing or other approved means. Prepare surface for painting by blasting to achieve a SSPC-SP-10 "Near White Metal Blast Cleaning". Use masking to avoid painting machinery surfaces which are in normal rubbing contact, such as shaft journals and bushings, and sliding guides.

After properly cleaning the surfaces apply one prime coat of shop paint to all unfinished machinery surfaces. Use a primer compatible with the paints selected for subsequent coats.

All finished contact surfaces which are not finally assembled in the shop shall be coated with waterproof National Lubricating Grease Institute No. 3 Multipurpose grease as soon as possible after being accepted and before removal from the shop, and shall be adequately protected during shipment by wrapping with burlap or canvas held by wooden bats securely wired together. During erection, these surfaces shall be thoroughly cleaned and a field coat of grease applied prior to assembly.

After erection and installation is completed, clean and paint all remaining non-rubbing, exposed machinery surfaces with an intermediate, weather resistant free coat. Upon completion of all operation and acceptance tests and after removing all accumulated grease, oil, dirt and other material, apply a final finish coat.

B.10 Weldments

Weldments for machinery base/frame supports and cylinder brackets furnished shall be neat and shall have all exposed sharp corners and edges removed. Mounting surfaces of the support frames shall be straight and flat such that full contact with the equipment being supported or retained is achieved.

All welding required herein or called for on the plans shall be done according to the requirements of AWS D1.5 and standard spec 506.3.19. Weldments shall be stress relieved by heat prior to final machining. The fitting up and welding procedure shall be such that distortion of the work will be a minimum. If necessary to obtain this result, suitable welding fixtures shall be used. The contractor shall submit welding procedures, together with the working drawings for the parts to the engineer for approval.

All welds shall be inspected according to requirements of AWS D1.5. Location of tests shall be selected at random so as to be typical for each size and type of weld. All weld basis of acceptance shall be according to the requirements of AWS D1.5.

B.11 Mechanical Components for Hydraulic System: Dimensions, Fits, and Finishes

Fabricated mechanical components furnished or rehabilitated under hydraulic work shall meet the requirements for such components as described under the Special Provision BRIDGE MACHINERY - GENERAL. Dimensions of machined parts are the finished dimensions after fabrication and machining. Unless otherwise specified, all dimensions for machine finished surfaces and parts shall be held within a tolerance of 0.010". Fits for cylindrical parts shall also apply to the major dimensions of non-cylindrical parts. Fit, finish, and tolerance of manufactured parts and their mating parts shall conform to AASHTO Specification Article 6.7.8.

B.12 Span Drive

B.12.1 General

The movable span shall be powered by a multi-pump hydraulic power unit (HPU). The HPU shall have electric motors and pumps as shown in the Plans. Hydraulic jacking cylinders shall be rehabilitated as specified in the plans and this Special Provision.

The system shall be redundant such that if one of the main motors or pumps is out of service, the system can be operated at half speed by remaining components of the system. Normal operation of the bridge under all load conditions is with the two main motors and main pumps on the power unit operating. Emergency operation of the bridge will be under the same loading conditions with only one motor and pump on the power unit operating. Additional redundancy shall be furnished at various components by means of manual operators to supplement electrical control.

Corrosion resistant nameplates shall be provided for each hydraulic component, including all functional components on the HPU and mounted near the jacking cylinders such as pumps, motors, safety features, indicating and control components, heaters, pressure gauges, test ports, valves, piping, etc. Nameplates shall clearly indicate the function of each device and, in the case of manually operated valves or controls, shall indicate the normal condition (normally open or normally closed) established for each position of the valves or control. Lettering on the nameplates shall be machine-engraved on plastic laminate with white characters on a black background. The nameplates shall be mounted in its respective location in a position that is easily visible to bridge personnel.

Normally closed shutoff valves shall be provided with corrosion resistant red handles. Normally open shutoff valves shall be provided with corrosion resistant green handles. Color markings shall be durably bonded to the handle, and color shall not be subject to removal by normal wear.

Instruction plates for the manual control and emergency bypass of the hydraulic equipment shall clearly indicate the proper procedures and sequences of operations to activate the system, to operate the system, and to secure the system after completion of operation. All modes of operation shall be described, including normal operation, emergency operation, normal stop, emergency stop, power failure, and emergency lowering during electrical system and generator failure. Instruction plates shall contain permanent black letters on a white background. Instruction plates shall be mounted on a rigid backing, covered with clear, rigid plastic sheeting and be weather-proof. Instruction plates shall be mounted in locations easily visible to bridge personnel at the HPU.

Electrical apparatus for controlling the operation of the span shall include an electrical terminal cabinet mounted on the HPU. All other conduits, cabinets, wiring, cables and other equipment required to extend the necessary electric circuits to the HPU terminal cabinet and to separately mounted components shall be furnished under Bridge Electrical Work and installed by others.

B.12.2 Hydraulic Power Unit for Span Operation

The hydraulic power unit (HPU) for span operation shall be of simple design and substantial construction. The arrangement of parts shall permit easy erection, hydraulic connection, electrical connection, adjustment, and replacement of defective parts, and shall be accessible for inspection, cleaning, lubrication, maintenance and repairing. The fastening shall be adequate to hold the parts in place under all conditions of service.

All parts, motors, pumps, valves, etc. shall be mounted over an integral drip pan to contain oil spills when servicing or replacing the unit. Drip pans shall be equipped with drain spigots and suitable clearance for drainage and collection. Drip pan material shall be ASTM A276 Type 316 or ASTM A666 Type 304 stainless steel.

The entire hydraulic power unit shall be framed for ease of handling using a forklift, and the framing shall also include lifting lugs or lifting eyes to allow movement by come-along. The framing members shall be standard rolled steel shapes such as channels, angles, and wide-flanged beams.

The hydraulic power unit shall be completely pre-wired, in that all components requiring electrical power or control shall be connected to a junction box furnished and installed on the end of the hydraulic unit, in the location shown on the plans.

The hydraulic power unit and all components shall be detailed to provide the intended functions of power and control. Unless otherwise noted, every component or assembly shall be rated for the maximum flow and pressure it will be subjected, or to 3,000 psi, whichever is greater.

The contractor shall be responsible for selecting components that provide the intended function and meet the specified performance criteria. Any component features not specifically mentioned herein, additional components, or additional piping required to adapt specific components to meet the design intent, including external drains, reducing valves, flow control valves, etc., shall be furnished at no additional cost.

The HPU shall have two identical pump/motor groups, both of which shall be used for normal operation and either one of which can be used separately for emergency operation. The lift span shall be raised under power and lowered by the span unbalanced weight. Manual overrides at the solenoid valves shall also be included should it be necessary to operate the valves without electrical control of the solenoids on an emergency basis. A placard with emergency instructions for immediate shutdown shall be located near the HPU, including a reference to the instruction plates (described above) for emergency lowering operation.

Hydraulic pumps shall be of the axial piston type with swashplate adjusted to the required displacement and flow according to the requirements for time of bridge operation. Main pumps shall have a net volumetric output as required for the lifting of the span at required speeds at no less than 85% volumetric efficiency at a motor speed of 1725 rpm when lift span is under normal conditions of 72,000 lbs. span-heavy unbalance plus 26,000 lbs. frictional and wind loads, when the lift span is clear of ice. Pump displacements under maximum load with ice, as stated under Capacities and Speeds, shall not overpower the capacity of the motors beyond their service factors. Each pump shall be connected to a standard TEFC/NEMA C-faced electric motor and coupling arrangement. Electric motors shall be according to the requirements as specified under Bridge Electrical Work.

The pumps and electric motors shall be connected by means of a suitable grid type flexible coupling with misalignment to be no more than the manufacturer's maximum recommendation. Coupling halves shall be keyed to their respective shafts. Coupling set screws shall be secured with a high-quality thread locking material. The entire pump/motor assembly shall be mounted with the pump assembly submerged as shown on the Plans.

Power unit wiring shall conform to standard electrical practices. Seal-tite shall be used between HPU terminal box and HPU electrical components where runs will be less than two feet. For runs over six feet, PVC coated, zinc-coated rigid conduit shall be used in conjunction with seal-tite, keeping seal-tite runs under two feet in length.

B.13 Reservoirs

The hydraulic reservoir shall be fabricated from stainless steel ASTM A276 Type 316. The reservoir shall have a minimum capacity of 2.5 times the maximum flow per minute during normal operation, plus 15%, and shall be filled to the level of 2.5 times the maximum flow per minute when the jacking cylinders are completely retracted and the entire hydraulic span piping system is filled to capacity. The thickness of the wall material for the reservoirs shall be sufficiently designed for all components mounted to the reservoir. The reservoir top shall be designed and constructed to shed any fluid that may collect on the top without draining into the reservoir. In addition, the top surface shall be of such construction that it can be easily wiped to remove contaminating substances.

A minimum of two removable clean out covers shall be installed on the accessible faces of the reservoir on which no components are mounted. Each reservoir shall have suitable baffles to assist in fluid conditioning, and each area between the walls of the reservoir and the baffles, and between the baffles, shall be accessible by use of the clean out portals. A water vapor barrier-type 3-micron breather shall be installed on the sealed reservoir. Breather assembly shall be spin-on type with visual clogging indicator and a 100-cfm capacity. A provision shall be made such that new fluid can only be added to the sealed reservoir by pumping it through the return filter.

In addition to the general features required in all hydraulic reservoirs, the following items shall be incorporated into the hydraulic span drive reservoir. When available on the open market for standard products, all switches shall be furnished with one normally open and one normally closed contact, the extra contact to be considered a spare for future use. The positions or settings of all switches shall be easily adjustable by at least 20 gallons in either direction for level switches, and by at least 30 degrees in either direction for temperature switches:

- Low level float switches – two positions. These shall include low fluid level indication switch [FS 1], contact to close if fluid level falls below level of 60% of filled capacity (adjustable), and low fluid level interlock switch [FS 2], contact to close if fluid level falls below level of 40% filled capacity (adjustable).
- High fluid level console indication switch [FS 3], contact shall close if fluid level rises above level of 110% filled capacity (adjustable).
- Fluid level gauge, with visible level indication over the range of the fluid level switches (between 110% and 40% of normal filled capacity).
- Fluid temperature gauge (thermometer), with minimum visible range between 30 degrees F and 180 degrees F.
- High fluid temperature indication switch [TS 1], contact shall close if temperature rises to 140 degrees F.

- Low temperature indication switch [TS 2], contact shall close if temperature falls below 55 degrees F.
- Future provisions shall be provided for the addition of a heat exchanger for the reservoir. At a minimum, two ports shall be provided at one end of the reservoir that will allow connection of 1.5-inch diameter tubing at appropriate fluid levels for optimum installation of a commercially available heat exchanger unit. Catalog cuts shall be provided on the proposed unit. A diagram and schedule listing all material required for future heat exchanger installation shall be furnished with the shop drawings.
- Hydraulic oil fill connection that permits oil fill only through a 10-micron filter (return filter).
- Reservoir drain port with shutoff valve.
- Fluid sampling port.

In addition, the hydraulic power unit and the remainder of the hydraulic circuits shall have all features shown or indicated on the plans or described herein.

B.14 Manifolds and Subplates

Manifolds and subplates shall be used to house and mount all valving and other components as specified or shown on the plans. Unless otherwise specified or shown, manifolds shall be constructed from corrosion resistant steel or aluminum alloy as required for the specified working pressures. Subplates shall be provided to mount all separately mounted components, as required. In exposed areas under the lift span, hydraulic components shall be provided with removable steel covers with gasket seals for protection.

B.15 HPU Terminal Panel

An electrical terminal panel specifically for the hydraulic power unit shall be furnished and installed on the HPU as part of Bridge Electrical Work.

B.16 Bridge Hydraulic System Operating Components

All main system valves and other operating components shall be rated for intended flow and pressure. ANSI standard sub-plate mounted valves shall be used for ease of servicing.

B.16.1 Cam Operated Proportional Flow Control Valve Assemblies

The main speed control valves shall be cam operated proportional flow control valves capable of controlling smooth starts and stops, and capable of providing the entire amount of fluid required for smooth acceleration, deceleration, and operation of the jacking cylinders. Cam operated valves shall be as manufactured by Parker/Manatrol, Cleveland, OH; Bosch/Rexroth, Bethlehem, PA; ZATRAM, Elyria, OH; or approved equal.

The main spool of each valve shall be a metering control spool, spring loaded to the normally closed position. As the cam depresses the plunger, flow through the valve shall gradually increase in a linear manner to a full open condition. As the cam is withdrawn to allow the plunger to extend under spring loading, flow through the valves shall gradually decrease to a full closed condition. Engineering data, including a chart of flow characteristics at various plunger positions and pressures, shall be submitted for approval.

Valve plungers shall be actuated by means of hydraulic actuators with wedge shaped rod end attachments to be used as cams, as shown on the plans.

Modular assemblies for subplate mounting of all these components shall be provided as shown on the plans to provide slow and fast speeds in sequence. These assemblies shall consist of subplate(s) for nominal Slow and Fast speeds, with cam operated flow control valves, hydraulic cylinder actuators with wedge shaped rod end cam attachments, and mechanical limit switches at the ends of stroke for both actuators. Protective covers of 10-gauge (min.) steel shall be furnished and bolted over the assembled components to protect them from damage, and to protect personnel from injury during operation. The assemblies may also include the solenoid operated directional control valves controlling the hydraulic cam actuating cylinders, and their adjustable flow controls.

The actuators and rod-attached cams, cam operated valves, and the limit switches for each speed shall be fully installed and aligned on the subplate(s) in the shop. The assemblies shall be fully tested in the shop to ensure proper operation. The positions of the cams and the limit switches shall also be field adjustable to the extent necessary to ensure full actuation and retraction of the cam operated valve, with electrical indication fully adjustable from both ends within the range of stroke.

One or two cam-operated valves may be used to provide the flow required within each nominal speed range, for both fast and slow speeds. Flow through the valves shall be fully reversible for raising and lowering the span at the required speeds. The valves shall have the operating stroke dimensions shown on the plans. Any changes required for the cam actuators, cams, limit switch arrangements, or any other components because of differences in capacity or stroke shall be made by the contractor at no cost to the department.

B.16.2 Cam Actuating Cylinders

Double acting hydraulic cylinder actuators with special wedge-shaped rod end attachments shall be furnished and installed as part of the cam actuated valve assemblies for the control of the cam operated flow control valves. The actuators shall be aligned with the cam operated valves so that the cam operated valves open gradually to full flow from the closed position as the actuator extends, and close gradually from the open position to the closed-to-flow position as the actuator retracts.

Actuators shall be at least 1.5 in. diameter bore x 3 in. stroke, with rod diameter and all components suitable to withstand the cam loading to be applied. The rod diameter shall be limited so that the effective pressure area of the piston while retracting is at least 75% that of the pressure area when extending.

Actuator rods shall not rotate as the actuator rod extends or retracts, and shall have the capability to withstand side loading of the actuator rod as it extends while actuating the cam operated valve. Rod end attachments shall be specially machined to the dimensions shown on the plans for this purpose. The position of the cam attachments on the rod ends shall be adjustable by means of the threaded end of the rod and the use of a jam nut.

Cam Actuating Cylinders shall be as manufactured by Bosch/Rexroth Corporation, Bethlehem, PA; Air-Dro Cylinders, Decatur, AL; or approved equal.

B.16.3 Flow Control Valves

Adjustable flow control valves shall be furnished and installed in the locations shown on the plans. For the cam actuating cylinder control, the flow control characteristics shall be such that the slow speed cam actuator can be adjusted to extend/retract over 3 to 5 seconds, and such that the full speed cam actuator can be adjusted to extend/retract over a period of 3 to 5 seconds. In other locations, the adjustment shall range from zero to the full flow required in that portion of the circuit. Flow control valves shall be as manufactured by Bosch/Rexroth, Bethlehem, PA; Parker-Hannifin, Cleveland, OH; Dana/Weatherhead, Maumee, OH; or approved equal.

B.16.4 Shutoff Valves

Shutoff valves shall be furnished and installed in locations indicated on the hydraulic schematic. A red handle shall be furnished and installed at shutoff valves that should be kept normally in the closed to flow position. A green handle shall be furnished and installed at shutoff valves that should be kept normally in the open to flow position. If closing or opening a particular valve during operation of the span should not be permitted, in that it would be detrimental to the equipment or dangerous to personnel, the handle shall be furnished with a padlock and hasp to prevent adjustment of the valve without a key. Shutoff valves shall be as manufactured by Stauff, Waldwick, NJ; Bosch Rexroth, Bethlehem, PA; Dynaquip, Fenton, MO; or approved equal.

B.16.5 Electric Motors

Electric motors for both pumps on the main HPU shall be totally enclosed, squirrel cage AC motors suitable for pump operation. See the Special Provision for Bridge Electrical Work for additional motor requirements.

B.16.6 Accumulator

A piston type accumulator of approximately 5-gallon capacity shall be furnished and installed at the HPU for the purpose of pre-pressurizing the hydraulic system prior to operation. Accumulator shall be as manufactured by Parker Hannifin, Cleveland, OH; Oil-Air Hydraulics, Houston, TX; or approved equal.

B.16.7 Accumulator Safety Block

An accumulator safety block for the purposes of de-pressurizing the hydraulic system between operations shall be furnished and installed in the location indicated by the hydraulic schematic. The purpose of this safety block is to ensure that the accumulator is fully discharged when not required between span operations. Accumulator safety block shall be as manufactured by Parker Hannifin, Cleveland, OH; Oil-Air Hydraulics, Houston, TX; or approved equal.

B.16.8 Check Valves

Check valves shall be furnished and installed in the locations indicated by the hydraulic schematic to provide free flow in one direction and prevent any flow of hydraulic fluid from

occurring in the other direction. Check valves shall be as manufactured by Bosch/Rexroth, Bethlehem, PA; Dennison Hydraulics, Marysville, OH; Parker Hannifin, Cleveland, OH; or approved equal.

B.16.9 Relief Valves

Relief valves shall be furnished and installed where shown and as indicated to prevent excessive high pressure from occurring in the Bridge Hydraulic Systems. Pressure settings shall be adjustable. Relief valves shall be as manufactured by Bosch/Rexroth, Bethlehem, PA; Parker Hannifin, Cleveland, OH; or approved equal.

B.16.10 Shuttle valve

A shuttle valve shall be furnished and installed in the location indicated by the hydraulic schematic. It shall be located between two incoming lines, as indicated, and shall cause fluid flow and pressure to be transmitted into the outgoing line by the incoming line of the highest pressure. Shuttle valves shall be as manufactured by Bosch Rexroth, Bethlehem, PA; Parker-Hannifin, Cleveland, OH; or approved equal.

B.16.11 Solenoid operated directional valves

Solenoid operated directional control valves with manual over-ride features shall be furnished and installed in the locations indicated on the hydraulic schematic. They shall be of the required capacity to accommodate the flow and pressure requirements of the components downstream. Directional valves shall be as manufactured by Bosch/Rexroth, Bethlehem, PA; Parker Hannifin, Cleveland, OH; or approved equal.

B.16.12 Pressure switches

Bridge Hydraulic System pressure switches shall be furnished and installed in the locations indicated by the hydraulic schematic. The pressure switches shall be capable of indication and adjustment in the range of pressure required. Pressure switches shall be as manufactured by Allen-Bradley, Milwaukee, WI; Barksdale, Los Angeles, CA; Bosch/Rexroth, Bethlehem, PA; or approved equal.

B.16.13 Pressure gauges

Pressure gauges shall be furnished and installed in the locations indicated by the hydraulic schematic. All pressure gauges shall be rated for 3000 psi (min.) service, but shall indicate the required range of pressure reading. Faces of pressure gauges shall be of a clear flexible material not subject to cracking or fracture by impact. Pressure gauges shall be as manufactured by Parker Hannifin, Cleveland, OH; Bosch/Rexroth, Bethlehem, PA; No Shok, Cleveland, OH; or approved equal.

B.16.14 Temperature gauges

Temperature gauges to indicate the temperature of the hydraulic fluid shall be furnished and installed in accessible locations, easily viewed with respect to the configuration of the machinery room, on the reservoir of the hydraulic power unit. Temperature gauges shall be as manufactured by Parker Hannifin, Cleveland, OH; Vescor; or approved equal.

B.16.15 Temperature switches

Temperature switches shall be furnished and installed in the locations indicated by the hydraulic schematic. These shall indicate higher or lower than acceptable fluid temperatures by closing contacts to send a signal to the electrical system for indication and interlock. Temperature switches shall be as manufactured by ITT-Neodyne, Valencia, CA; or approved equal.

B.16.16 Level gauges

Level gauges to indicate the level of fluid in the reservoir shall be furnished and installed in accessible locations, easily viewed with respect to the configuration of the machinery room, on the reservoir of the hydraulic power unit. Level gauges shall be as manufactured by Parker-Hannifin, Cleveland, OH; Vescor, South Elgin, IL; or approved equal.

B.16.17 Level switches

Level switches to indicate acceptable and unacceptable levels in the hydraulic reservoir shall be furnished and installed in the reservoir of the hydraulic power unit. These shall indicate higher or lower than acceptable fluid levels by closing contacts to send a signal to the electrical system for indication and interlock. Level switches shall be as manufactured by Barksdale, Los Angeles, CA; GEMS Sensors, Plainville, CT; or approved equal.

B.16.18 Heat exchanger

If required, an air radiation-type heat exchanger of the capacity required to keep the oil in the reservoir under 140 degrees F. during times of frequent operation in hot weather shall be furnished and installed on the hydraulic power unit reservoir. The heat exchanger shall have the capability to dissipate the amount of heat generated by continuous operation of the main pump at maximum pressure, while discharging over the relief valve at its specified setting, for four hours in ambient temperatures of 100 degrees F. On this basis, the temperature of the oil shall never exceed 140 degrees F. when starting from a temperature 80 degrees F. Heat exchanger proposed shall be as manufactured by Hayden, Thermal Transfer Systems, Dallas, TX; or approved equal.

B.17 Materials for Rehabilitating Hydraulic Jacking Cylinders

Seals shall be replaced in kind. A hard polyester (Hallite 38 or equal) scraper shall also be provided in place of existing. All components shall be compatible with the hydraulic fluid and as recommended by the original cylinder manufacturer.

B.17.1 Cylinder Control Module

A cylinder control module (manifold) shall be rigidly plumbed with Type 316 stainless steel tubing and supported near to each main drive cylinder jack. Details of the method of attachment shall be submitted to the engineer for review and approval. Brackets, hardware, and fasteners shall be Type 316 stainless steel. This module shall include the pressure switches, solenoid valves, gauges, and other features shown in the proximity of each cylinder jack on the schematic, and shall positively lock the cylinders in any position even in the event of a fluid line failure by means of a solenoid valve. The hydraulic cylinders shall automatically close to provide instant braking and holding capability for the lift span should pressure be lost in the hydraulic piping system, and shall be capable of holding the

lift span in any raised position for at least 4 hours without movement after the hydraulic power unit is turned off. This module shall provide the relief function through the action of the electrical system should pressure remain or build up in the cylinders between operations. Means for emergency manual lowering of the bridge shall be provided as shown in the plans. The manual operators shall be color-coded and be referenced by a placard located in the area describing emergency lowering procedures.

B.18 Hydraulic Cylinder Supports and Attachments

Hydraulic cylinder supports and attachments shall be suitable for the existing cylinders, the required piping, and the mounting and function of the cylinders and piping within the pier, as shown on the plans and defined herein. Supply all support components, brackets, shims, pins, hardware, bearings, shrouds, grout, and anchor bolts as required. This work shall include surface preparation and leveling, installation and alignment.

The contractor shall submit shop drawings of all fabricated components of the hydraulic cylinder supports to the engineer for review prior to fabrication, together with complete assembly and installation drawings.

B.19 Hydraulic Fluid

All hydraulic fluid required for testing, storage, and to flush and install the system in working order shall be provided. The hydraulic fluid shall be the same as that now used by the City of Milwaukee in the existing operating system, unless otherwise approved by the engineer. All components, seals, etc., shall be compatible with the approved fluid.

B.20 Filtration and Oil Sampling

The hydraulic system shall be fitted with filtration suited for the application.

The system shall be fitted with full flow pressure and return filtration. The pressure filters shall be sub-plate mounted to the main control manifold. The return filter shall be tank top mounted. Each filter shall have a bypass and a local visual indicator as well as electrical contacts as shown on the plans. The replacement filter elements shall be of quality construction with a 10-micron rating of beta 10>100 or better.

A drain valve shall be provided at the bottom of the HPU reservoir as shown on the hydraulic schematic. Fluid sampling shall be performed by the contractor, and fluid shall be tested by an approved and qualified testing service prior to acceptance of the structure. Testing shall include oil quality including analysis for levels of contamination. Wear particle detection shall include both metallic and non-metallic particles, including the detection and analysis of hydraulic hose particles. The oil shall also be analyzed for the presence of contaminating liquids such as water. Fluid testing shall be done both at the hydraulic power unit and at or near a hydraulic cylinder jack on the west pier.

Two oil testing services with the capabilities outlined above shall be identified by the hydraulic supplier. This information, together with recommendations and quotations for periodic sampling and testing, shall be furnished to the department prior to acceptance.

B.21 Seals

The seals for hydraulic components shall be suitable for the hydraulic fluid supplied.

B.22 Plumbing and Fittings

All hydraulic plumbing shall conform to current Bridge Hydraulic System standards as required by the AASHTO Specifications. Unless otherwise specified, rigid plumbing shall be seamless ASTM A269, Grade TP304 annealed stainless steel tube and ASTM A312 - Grades TP304 or TP316 stainless steel pipe as applicable. Fittings shall be SAE four bolt socket weld O-ring flange, 37° flare, or 37° O-ring seal. Threaded connections shall be SAE straight threads wherever possible. All piping located over the river shall be fully welded without bolted connections. All fittings shall be Type 316 series stainless steel. The use of hydraulic clamps is mandatory. All clamp fasteners, plates, and brackets shall be Type 316 series stainless steel. The contractor shall follow clamp manufacturer's specifications for spacing and installation.

Tubing and pipe shall be sized to provide a minimum factor of safety of four based on burst pressure. Factors of safety shall be based on the maximum working pressure as defined by AASHTO. Fluid velocity in piping and hoses shall not exceed 20 FPS for pressure lines, 13 FPS for return lines and 4 FPS for suction lines. In addition, fluid lines shall be no smaller than those shown on the plans for any particular location.

The contractor shall add to the Bridge Hydraulic System fluid lines in strategic locations any required ports or connection points deemed necessary to completely flush the system after assembly. The location of these ports and connection points shall be in accord with the contractor's submitted plan of flushing, as approved by the engineer. Such connection points and ports, together with all required components, shall be considered incidental.

B.23 Hydraulic Pipe and Tube Supports

Hydraulic pipe and tube supports shall be a strut mounted cushion clamp system. Support brackets and hangers, as well as all clamps, fasteners, and channels shall be Type 316 series stainless steel. All pipe and tube supports and their spacing shall conform to the requirements ISO 4413, Section 5.4.6.

B.24 Hydraulic Hose Assemblies

Flexible hose shall be of the proper SAE rating, consistent with the working pressure encountered and having the working and burst pressures required by AASHTO. Hydraulic hose assemblies shall be provided between the east pier and the lift span in the location shown indicated on the plans. Additional use of flexible hose shall include: suction, drain, bypass, and pressure lines connecting all pumps to the system field plumbing. All hose assemblies shall be assembled with a proper sealant of high quality. Hose ends shall be FJICS 300 series stainless steel. Hose guards constructed of steel wire and plated to resist rust shall be used to protect and prolong the life of the flexible hose lines from abrasion, deep cuts, distributes bending radii, and kinking.

B.25 Hardware and Fasteners

All fasteners bolts, anchors, nuts, washers, and all other mounting hardware used on all the hydraulic equipment and power units shall be Type 316 stainless steel unless otherwise noted.

B.26 Undercut Anchors

Where specified in the plans, and as required due to replacement, cylinder supports shall be anchored to the concrete using undercut anchor bolts. The undercut anchors shall be of the length and diameter as indicated on the plans. The undercut anchor shall resist applied loads through bearing on the surface of the conical portion of the drilled hole. Wedge or sleeve anchors that rely on friction to resist applied loads will not be permitted.

Undercut anchors shall be hydraulically tensioned.

Unless otherwise specified, the undercut anchors shall be fabricated from the following materials:

Bolts	ASTM A193M Grade B7
Sleeves	ASTM A513 Type 5
Conical Nuts	ASTM A193M Grade B7
Heavy Hex Nuts	ASTM A194M Grade 2H
Washers	ASTM F436

All anchor components shall be zinc plated according to Federal Specification QQ-Z-325C.

All installation equipment including drills, drill bits, undercutting tools, tolerance gauges, and tensioning devices shall conform with the manufacturer's recommendations. The contractor shall submit his proposed list of equipment and installation methods to the engineer for review.

The contractor shall install the undercut anchors in compliance with the manufacturer's recommendations. The contractor shall employ at least one person with demonstrated experience in setting undercut anchors and shall arrange to have a qualified representative from the manufacturer on site to supervise the installation.

The sleeve shall be removed after the anchor is set and the void around the bolt shall be injected with an epoxy grout. Material and grouting methods shall be per the anchor manufacturer's recommendations.

Each undercut anchor shall be tested to the maximum listed allowable load as verification of proper installation. Contractor shall test bolts by using hydraulic jacks, recording the pressure and converting the pressure to pounds.

B.27 Epoxy Leveling Grout

Epoxy leveling compound shall be a two component, pourable epoxy based grouting compound for severe applications. Epoxy leveling grout shall be manufactured for use in a thickness range of ½” to 1-1/2”.

Epoxy leveling grout shall have the following minimum properties:

Compressive Modulus of Elasticity:	1640 kips, ASTM C109
Maximum Compressive Strength:	19 ksi, ASTM C109
Fire resistance:	Self-extinguishing, ASTM D635
Maximum Izod Impact Strength:	3.4 in.lbs./in., ASTM D256
Maximum Linear Shrinkage:	0.0001 in./in., ASTM D2566
Maximum Tensile Strength:	2 ksi, ASTM D638
Max. Coefficient of Linear Expansion:	32°F-140°F, 15.4×10^{-6} /°F, ASTM D696

Grout shall be stored, mixed, placed, and finished in strict accordance with the manufacturer's recommendations.

B.28 Spare Parts

The contractor shall furnish the following spare parts:

- 1 Set of plugs for each actuator to seal off all ports.
- 1 Set of plugs for power unit to seal off check valves should pumps be removed from service.
- 2 Seal kits for hydraulic cylinder jacks.
- 2 Seal kits of each type and size for all other hydraulic components
- 1 each High pressure hose assembly with fittings for each type of hose furnished and installed.
- 4 Pressure gages with hose and fittings for reading pressure in main drive actuators.
- 4 each Replacement elements for all filters and breathers.

Spare parts shall be labeled and organized in such a manner that each spare can be readily identified and associated with the specific hydraulic component item number for which it is required. Spare parts shall be so placed in a steel cabinet with a padlocked door to be provided by the contractor and installed in the operator house as directed by the engineer.

B.29 Speed and Directional Control

B.29.1 General

The speed control of the Bridge Hydraulic System for the lift span shall be provided by mechanically actuated proportional flow valves used together with two fixed displacement pumps. The mechanical actuation of these proportional flow valves shall be by means of small actuating cylinders, controlled by solenoid actuated directional valves. There shall be an electrical panel on the HPU where the hydraulics shall interface with the bridge control system by means of dry contact inputs and outputs. See plans for New Hydraulic Schematic and HPU layout.

B.29.2 Control Theory - Normal Operation

The following is a brief description of operator actions and automatic interlocking during operation with regard to the Bridge Hydraulic System only. Other interlocks with regard to traffic control and sequence prior to operation, as well as more detail regarding the following, are part of the electrical design.

- Both MOTORS (1) [M1 and M2] are selected. Upon turning on the MOTORS (1), PUMPS (3) will produce initial nominal pressure at the Accumulator (17) and indication of nominal pressure at both Pressure Switches (22) [PS1] and [PS2]. PRESSURE SWITCH [PS1] will close to detect that nominal pressure is being produced by the pumps. PRESSURE SWITCH [PS2] will energize Solenoid Valves (33) [SV5] and (37) [SV6] to maintain pressure in the ACCUMULATOR (17), and will also energize SOLENOID VALVE (14) [SV1] so that pump flow is diverted back to the Reservoir prior to raising the lift span.
- Operator has the option to move Joystick Controller to “RAISE-SLOW” or “RAISE FAST” at will during raising, and to “LOWER-FAST” or “LOWER-SLOW” on the same basis during lowering to control the speed manually, or to stop the span at any time by moving the joystick controller to “STOP”. The pump motors will run when raising the span, and when the joystick is in the neutral position. When Joystick Controller is in neutral position or moved to one of the LOWER positions, Solenoid Valve (14) [SV1] will remain energized so that flow from either the pumps when in neutral or from the JACKING CYLINDERS (23) when lowering is diverted to the Reservoir. Upon moving the Joystick Controller to a RAISE position, Solenoid Valve (14) [SV1] will de-energize so that pump flow is directed toward the JACKING CYLINDERS (23) to raise the lift span. The MOTORS (1) [M1 and M2] will shut down during lowering of the span by means of Joystick Controller selection of a LOWER position, thereby allowing the span to lower by gravity.
 - a. Selecting RAISE or LOWER will cause the SOLENOID VALVES (18) [SV3 and SV4] to act in sequence by means of LIMIT SWITCHES contacted by the ACCEL/DECEL ACTUATORS (34) at the ends of their strokes.
 - (1) When raising or lowering, the selection of “RAISE- ” or “LOWER-FAST” shall initially cause SLOW SPEED SOLENOID VALVE (18) [SV3] to energize, causing the SLOW SPEED ACCEL / DECEL ACTUATOR (34) to extend over a 3-4 second period (subject to hydraulic adjustment by means of SLOW SPEED FLOW CONTROL VALVE (35)). When the SLOW SPEED ACCEL / DECEL ACTUATOR (34) is fully extended, thereby having accelerated the span to approximately 1/2 of full speed, LIMIT SWITCH [LS-3E] shall be contacted that will allow FAST SPEED SOLENOID VALVE (18) [SV4] to be energized (provided the span has traveled beyond the Nearly Closed position, and has not attained the Nearly Open position (or vice-versa when lowering)). This shall cause the FAST SPEED ACCEL / DECEL ACTUATOR (34) to extend, bringing the span to

full speed over a 3-4 second period (again subject to hydraulic adjustment, by means of FAST FLOW CONTROL VALVE (35)).

(2) Moving the joystick controller to “RAISE- ” or “LOWER-SLOW” from “RAISE-“ or “LOWER-FAST” shall cause FAST SPEED SOLENOID VALVE (18) [SV4] to de-energize. This shall cause the FAST SPEED ACCEL / DECEL ACTUATOR (34) to retract, bringing the span back to approximately 1/2 of full speed over a 3-4 second period (hydraulically adjustable, as described above).

(3) Moving the joystick controller to “STOP” from “RAISE- ” or “LOWER-FAST” shall initially cause FAST SPEED SOLENOID VALVE (18) [SV4] to de-energize. This shall cause the FAST SPEED ACCEL / DECEL ACTUATOR (34) to retract, bringing the span back to approximately 1/2 of full speed over a 5 second period (hydraulically adjustable, as described above). At this point, LIMIT SWITCH [LS-4R] shall be contacted to allow SLOW SPEED SOLENOID VALVE (18) [SV3] to de-energize, causing SLOW SPEED ACCEL / DECEL ACTUATOR to retract over a 3-4 second (hydraulically adjustable) period, bringing the span to a smooth stop. LIMIT SWITCH [LS-3R] shall be contacted at the fully retracted position of the SLOW SPEED ACCEL / DECEL ACTUATOR.

b. Random movements of the joystick controller by the operator, crossing “STOP” from a “RAISE” speed position to a “LOWER” speed position (or vice versa), without allowing the span to come to a full stop, should be prohibited. However, if such actions by the operator are performed, the following shall occur:

(1) Moving joystick controller from a “-FAST” position in one direction, to “-SLOW” or “-FAST” position in the opposite direction, shall initially cause FAST SPEED SOLENOID VALVE (18) [SV 4] to de-energize, but shall also cause the pump to immediately shut down causing the span to rapidly reverse direction. The Emergency Stop switch only should be used if an emergency stop is required. Otherwise, a normal stop should be used, causing the FAST SPEED ACCEL / DECEL ACTUATOR (34) to retract, bringing the span back to approximately 1/2 of full speed over a 3-4 second period (hydraulically adjustable, as described above). At this point, LIMIT SWITCH [LS-4R] shall be contacted to allow SLOW SPEED SOLENOID VALVE (18) [SV 3] to de-energize, causing SLOW SPEED ACCEL / DECEL ACTUATOR (34) to retract over a 3-4 second (hydraulically adjustable) period, bringing the span to a smooth stop. LIMIT SWITCH [LS-3R] shall be contacted at the fully retracted position of the SLOW SPEED ACCEL / DECEL ACTUATOR (34).

- c. Random movements of the pump (drive) selector switch between “BOTH” and “PUMP A” or “BOTH” and “PUMP B” during operation should also be prohibited. However, if these operator actions are performed, operation of the pump(s) currently selected will cease momentarily prior to any operation of the pump (drive) newly selected.
- Power failure during operation shall cause all motors to cease operation and all solenoid valves to de-energize momentarily prior to secondary power source being accessed, provided any delay occurs in the automatic transfer switch.
 - The “EMERGENCY STOP” push button can be used to cease all operation by de-energizing all SOLENOID VALVES and MOTORS. This shall effectively cause the span to stop while the Bridge Hydraulic System depressurizes.
 - If hydraulic pressure is lost in the Bridge Hydraulic System at any point during raising or lowering, as indicated by PRESSURE SWITCH (22) [PS2], all SOLENOID VALVES and MOTORS shall de-energize in the same manner as would occur during an emergency stop.
 - During periods of inactivity, during which the Bridge Hydraulic System remains idle, PRESSURE SWITCHES (22) [PS13, PS14, PS23, PS24] shall remain powered to detect excess pressure in the JACKING CYLINDERS (23). If a pressure build-up is detected at the JACKING CYLINDERS (23) during an idle period when the span is fully closed, SOLENOID VALVE (24) [SV 14, 24] shall open momentarily to allow the excess pressure to be removed from the JACKING CYLINDERS (23). This feature shall be de-activated during bridge operation and when the span is in any raised position.

B.29.3 Control Theory - Emergency Operation

The description of operator actions and automatic interlocking during operation with regard to the Bridge Hydraulic System is identical to that for Normal Operation, except that only one Motor (1) [M1 or M2] and its associated Pump (3) are used to raise the span. Interlocks with regard to traffic control and sequence prior to operation, as well as more detail regarding the following, remain part of the electrical design.

C Construction

C.1 General

The existing hydraulic system and supports shall be removed entirely from the structure, including the existing hydraulic jacking cylinders which shall be carefully removed to an approved facility for rehabilitation. Jacking cylinder rehabilitation includes the replacement of components indicated on the plans as well as replacement of existing supports. The jacking cylinders shall be protected from damage during removal, transportation, shop work, and reinstallation.

The new hydraulic system schematic is different than the existing system in that all jacking cylinders will now be connected to the hydraulic fluid lines through the tops of the cylinders only. Existing ports now being used at the bottom of the jacking cylinders shall be plugged and sealed. Supports for new hydraulic and electrical components at the tops of the cylinders shall be considered incidental to the installation. Access shall be provided for all adjustments at these components, and final adjustments made during testing shall be marked clearly by weatherproof means.

Installation, start-up, piping and flushing shall be done by an NFPA Certified Fluid Power Technician with prior experience on similar sized systems. Submit back-up information on technician showing prior experience to the engineer for review and approval.

The contractor shall be totally responsible for the coordination of the various subcontractors for this project and specifically the coordination of the mechanical, hydraulic, and electrical work in order to assure proper fit up and operation of the various components of the mechanical, hydraulic, and electrical systems. The contractor shall also be responsible for the shop adjustment and for fine adjustment in the field at the time of start-up.

C.2 Electrical Requirements

All hydraulic equipment shall be wired and connected to the electrical system under Bridge Electrical Work unless otherwise noted. The HPU electrical panel shall be installed in the operator house near the hydraulic power unit as directed by the engineer.

C.3 Hydraulic Cylinder Rehabilitation

Hydraulic jacking cylinders shall be carefully removed from the bridge to an approved hydraulic repair facility and shall be rehabilitated as shown on the Plans. Existing structural steel support frames with jack support plates, bearing plates, fill plates and shims, along with lubricated bronze plates shall all be replaced in kind. In addition, any supports required for new hydraulic components to be supported on or near the jacking cylinders shall be furnished and installed, and shall be considered incidental to Bridge Hydraulic System.

C.4 Hydraulic Cylinder Supports, Bracing, and Attachments

Baseplates and bracing shall be set such that the cylinders are within 0.050" of the dimensions shown in the plans, both vertical and horizontal in the longitudinal and transverse directions.

All cylinder support component alignments shall be verified by use of laser level or other approved method prior to final mounting of cylinder support components.

Supply all temporary templates, leveling screws, blocking, jacking screws, etc., as required to locate and install cylinder bracing and brackets.

Cylinder supports shall be painted according to the requirements for painting of structural steel.

C.5 Flushing

Using the contractor's approved plan for flushing the Bridge Hydraulic System after installation, the contractor shall ensure that all portions of the Bridge Hydraulic System are completely flushed according to the following:

Hydraulic fluid shall be used to flush the lines through pressure and return filters to remove any foreign particles from the hydraulic power unit and from the hydraulic lines installed on the piers and lift span. Temporary return hoses, previously flushed with filtered fluid individually, shall be used to connect between various portions of the system and the reservoir while the remainder of the system is isolated. Circulate fluid for at least one hour while consistently monitoring filter-clogging indicators. Repeat one hour flushing procedure for each remaining portion of the Bridge Hydraulic System. Replace filters after flushing is completed. Spare filters shall not be used as replacements.

In portions of the Bridge Hydraulic System that the contractor deems not practical for flushing using the hydraulic power unit, according to the contractor's approved plan, an approved portable pump and filtration unit together with any other required equipment, provided by the contractor, shall be used to accomplish total flushing. The portable filtration unit assembly shall include pressure and return filters of the same filtration capability characteristics as those used in the hydraulic power unit. The portable filtration unit shall become the property of the department at the end of the Contract.

Initial system filling and flushing should be done through a 5-micron filter with an efficiency rating of beta $10 < 50$. Flushing should be done only when atmospheric particles are at a minimum (no current or recent sandblasting or painting). Check reservoir condition through clean-out covers. All surfaces should be clean of dirt, rust or moisture. Once the reservoir has been determined to be clean, charge the reservoir with new hydraulic fluid for final use in the system. Replace return filter once reservoir is filled for final use. Spares shall not be used as replacements.

C.6 Inspection, Testing, and Final Acceptance

C.6.1 General

Fabrication of the hydraulic power units, HPU terminal panel and rehabilitation of the jacking cylinders shall be done in approved facilities. The department will send an inspector to the shop for verification of compliance and witnessing of shop testing prior to shipment of any equipment to the field. Prior to testing, the contractor shall notify the engineer three (3) weeks in advance for the ability to witness the components during testing. No testing shall be performed without the presence of the engineer or engineer's representative unless the contractor has been otherwise directed, in writing, by the engineer.

Shop testing shall be required of the HPU, cylinders, and HPU terminal panel. The procedure shall be comprehensive and shall test the HPU for functionality at full power under simulated loads and load changes and shall incorporate the assembled HPU terminal panel. Each cylinder shall be tested through 50 cycles while under a simulated maximum load for the full stroke of the cylinder. This test procedure shall be submitted to the engineer for review and approval.

All malfunctions shall be recorded and corrected and re-tested before release from the manufacturer's shop. After each cylinder and HPU, including the HPU terminal panel, have passed the test, a Certificate of Compliance shall be submitted with the test reports to the engineer for review and approval.

In the event the contractor should propose an alternate design which deviates from the designs shown in the plans, it shall become the responsibility of the contractor to provide sufficient back-up data and working examples to demonstrate the functionality of the design. These working examples shall be of large dynamic structures similar in concept to a vertical lift bridge. This data shall be compiled and neatly organized and submitted to the engineer along with the proposed hydraulic drive system for review. No material submitted shall relieve the contractor from performing the hydraulic power unit testing as required in this Special Provision.

When testing the HPU, the assembled HPU terminal panel shall be present and interfaced to the HPU to provide required signals for control.

C.6.2 Shop Testing

Additional requirements for shop testing are as follows:

- Hydraulic Power Unit Testing
 - a. Full flow pump testing
 - b. Pressure test to 1.5 times the maximum specified working pressure (1.5 times the main relief valve setting).
 - c. No visible external leakage permitted.
 - d. Electric motor performance at various pressure levels.
 - e. Verify limit / pressure switch and warning functions at the HPU terminal panel.
- Cylinder Testing
 - a. Pressure tested to 3,000 psi each direction. The use of compressed air to retract at end of test is not allowed.
 - b. No visible external leakage permitted.
 - c. Verify manifold operation and manual release of solenoid valves.

In addition to the above requirements, the contractor shall complete two checklists, one for the cylinder manifold assembly shop test report and one for the HPU shop test report. The following information, as a minimum shall be provided in the test report:

- Cylinder Manifold Assembly
 - a. Is block free of chips and dirt?
 - b. Are all customer's connections per drawing?
 - c. Do components agree with parts list?
 - d. Are all labels affixed?
 - e. Are all bolts properly torqued?
 - f. Is manifold complete per assembly drawing and parts list?

- Cylinder Manifold Test
 - a. What type of fluid used to test manifold?
 - b. Flow tested at manifold
 - c. Pressure tested at manifold
 - d. Are components adjusted according to schematic?
 - e. Do labels agree with schematic?
 - f. Is external leakage zero?
 - g. Does manifold function according to schematic?

- HPU Assembly
 - a. Visually check reservoir inside (Free from moisture, rust, slag or chips)
 - b. Are pipes routed correctly?
 - c. Electric Motor requirements (Model, Make, Type, Voltage, Amps, RPM, Hz, Frame, Service Factor, and Class)
 - d. Are fittings correct and per the parts lists?
 - e. Are all down pipes in reservoir clean?
 - f. Do components agree with parts list?
 - g. Is power unit built according to the contract drawings and approved shop drawings?
 - h. Do connections agree with schematic and arrangement drawings?
 - i. Does piping agree with schematic requirements?
 - j. Are filters accessible for changing?
 - k. Are manual overrides accessible?
 - l. Are direction of rotation arrows in place and correct?
 - m. Does unit have required labeling affixed?
 - n. Has correct fluid been supplied?
 - o. Fluid installed using required pre-filtration?

- HPU Assembly Test
 - a. Does reservoir leak? Check seams and welds.
 - b. Test electronics on unit (Temp, Level, etc.)
 - c. Pump settings (Pressure and Flow)
 - d. Voltage and amperage of motors while running.
 - e. Are components set properly and according to the schematic and shop drawings?
 - f. Are all fittings and flanges tight?

During placement of any of the new Bridge Hydraulic System in operation, the Bridge Hydraulic System Supplier and Installer shall be on site to inspect the installation of the hydraulic system to ensure it is installed to the supplier's requirements and tolerances. The Bridge Hydraulic System Supplier and Installer shall furnish a letter to the engineer after the inspection certifying that the installation is acceptable and in conformance to the requirements of the Bridge Hydraulic System Supplier and Installer.

The department shall be notified at least three weeks in advance of the field testing date(s) to have a representative present during field testing of the main drive system.

C.6.3 Field Testing

Field test requirements shall demonstrate full operation of the system under all potential conditions including the following:

- After all components (tubing, valves, etc.) of the fluid system have been physically torqued and inspected, obtain power source for the motors.
- All pressure relief valves and pressure switch settings which were not verified as part of the HPU testing in the shop shall be verified by testing that shall be recorded in the field.
- Cylinders shall be tested for pressure being exerted during operation, and for any leakage.
- Using the HPU control panel, fully open, close, and seat span. During this time, adjust flow control valves (35) to obtain correct speeds and ramps from Accel / Decel Valves (16) and (19).
- After several operations of step 4, check all areas for leaks, fluid temperature, and motor current drain. Connect all control wiring for console system test.
- Repeat using auxiliary mode and emergency power.
- Demonstrate all interlocks, emergency stopping indications, etc.

After system start-up is complete and unit is properly adjusted, the contractor shall draw an oil sample from the reservoir using accepted NFPA techniques and equipment. This sample shall be analyzed for particle content by an approved and qualified testing laboratory. The report shall be forwarded, in shop drawing format, to the engineer for review and approval. Cleanliness level shall be 18/16/13, or better if required for any specific hydraulic component, based on ISO DIN 4406 Standards. If this level is not achieved, the contractor shall be responsible to clean oil until proper cleanliness level is verified through re-sampling of the fluid.

The contractor shall operate the bridge ten times consecutively both on the main drive and on the auxiliary drive system, without problems, and demonstrate manual operation to lower the span using the Instruction Plates provided under Bridge Hydraulic System prior to final acceptance.

D Measurement

The department will measure Bridge Hydraulic System, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.508	Bridge Hydraulic System	LS

The lump sum price bid Bridge Hydraulic System shall include the cost of furnishing all labor, material, equipment, testing, O&M training and any incidentals required to complete the work which includes furnishing and installing the rehabilitated cylinders together with new brackets, HPU, valves, manifolds, piping, bolts, lubrication fittings and lubricants, shims, supports and any incidentals required to properly execute and place in complete working order the bridge hydraulic system according to the plans, Specifications, and Special Provisions.

Payment for furnishing electrical work associated with the bridge hydraulic system including terminal panel, wiring to motors, pumps, valves, and switches is not part of this item, but is paid for under BRIDGE ELECTRICAL WORK.

68. Field Verification Survey, Item SPV.0105.509.

A Description

This special provision describes performing a field survey of the existing Wells Street Lift Bridge for the purpose of establishing current dimensions and elevations to be used in the fabrication and construction of new bridge elements.

All dimensions and elevations shown on the contract plans are based on values found on the plans from the original bridge construction and subsequent bridge rehabilitations. These values should not be construed to be completed true or accurate. They are accurate enough for the design of the rehabilitation and for the establishment of bid quantities. However, the nature of the work involved in this rehabilitation is such that new elements must be constructed and fabricated to much closer tolerances than are needed for design. Shop drawings of the original fabrication can be made available to the contractor.

A Registered Land Surveyor with a minimum of five years of surveying experience, licensed to practice in the State of Wisconsin, shall conduct the field survey under this special provision. Prior to beginning the work, furnish the engineer the name of the surveyor and a copy of his registration certificate.

All survey field notes and sketches shall be kept in a neat orderly fashion so the fabrication and constructors of the new bridge elements can readily interpret them. If, following completion of the survey and submittal of all survey notes and sketches, questions arise regarding the meaning or interpretation of the notes and sketches, provide the necessary clarification and interpretation at no additional cost to the department.

B (Vacant)

C Construction

Conduct the survey in a timely and efficient manner prior to beginning any fabrication or construction of new bridge elements.

The survey shall include the determination of all dimensions and elevations necessary to fabricate and construct the new bridge elements.

It is expected that the results of the survey will correlate very closely with the dimensions and elevations given on the plans and/or shop drawings. If there are any obvious discrepancies of a magnitude that will severely and detrimentally impact the work, discuss with the engineer prior to proceeding.

Submit results of the survey, in the form of field notes, sketches and any other forms of survey documentation to the engineer for review before proceeding with fabrication.

Following the engineer's review, use the survey results to fabricate and construct new bridge elements as shown on the plans.

The survey shall include, but not be limited to, the following:

- Overall length and width of the bridge.
- Length of lift girders, floor beams, stringers, purlins, and sidewalk elements.
- Roadway, sidewalk, and riverwalk expansion joints including cover plates.
- Spacing of girders, floor beams, stringers, purlins, sidewalk elements.
- Elevations of lift girders, floor beams, stringers, purlins, and sidewalk elements.
- All relevant dimensions and elevations of bridge operating machinery necessary for the fabrication of new machinery elements or supporting steel.
- Documentation of revisions made to the bridge not shown on the original plans/shop drawings and subsequent rehabilitation.
- Elevation and location of holes and openings in the steel members to accommodate machinery components and cables.

The above list is not to be taken as complete or all inclusive. It is presented as an example of items to be surveyed. It is the contractor's responsibility to determine the full extent of survey necessary.

If it is determined that during the course of the work, additional survey is required, it shall be furnished at no additional cost to the department.

The results of the survey are the contractor's responsibility. These results are to be used in fabrication and erection of new bridge elements. As such, in the event that elements are incorrectly fabricated and do not fit existing spaces or conditions, the contractor is responsible for correction any such errors and repairing or replacing the parts and elements to the satisfaction of the engineer at no additional cost to the department.

D Measurement

The department will measure Field Verification Survey, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.509	Field Verification Survey	LS

Payment is full compensation for conduction the field survey of existing conditions as described herein; for providing clear and concise survey results; for performing any required resurvey or additional survey; and for furnishing all labor, tools, and equipment and incidentals necessary to complete the work.

69. Counterweight Balancing Calculations, Item SPV.0105.510.

A Description

The work covered by this item consists of preparing balancing calculations of the lift span and concrete counterweight to ensure compliance with the design criteria listed on the plans, specifications, and elsewhere here in for the lift span. Balancing material to be placed on the counterweight is paid for separately under the item Counterweight Ballast.

The work includes the calculation and documentation of the dead load and required counterweight to balance the span per the AASHTO guidelines.

B (Vacant)

C Construction

C.1 General

Perform all work according to the 2007 AASHTO Movable Highway Bridge Specification, including interims.

C.2 Calculations

Prepare balance calculations prior to fabrication and construction of new balancing blocks and supplemental counterweight steel based on approved shop drawings and material tests, and submit them to the engineer for review and approval. To permit detailed checking, prepare calculations by grouping material and computing subtotals as directed by the engineer. A professional engineer licensed in the State of Wisconsin shall perform the balance calculations.

Compute the quantity and location of balance counterweight required based on the specified balance requirements and the weight. Base these calculations on weights of approved shop details and material tests for the actual material on the lift span. Accurately compute the weight accounting for all material, weld fillets, bolt heads, washers, nuts, paint, and normal overruns on plate thickness, etc.

Develop summary balance tables and show them on the shop drawings. Develop summary tables for all phases of the balance and the proposed imbalances. Account for the temporary balance material, if used, in the summary tables. Submit all summary tables and back-up materials for review by the engineer.

Include a narrative with the outline of the proposed phasing, the duration of the imbalance condition, and all other aspects of the work according to the approved construction schedule. Coordinate this information with the contractor's scheduling requirements and submit to the engineer for review.

Develop weights for new work on the shop drawings for each component.

Update the balance calculations and summary tables through construction and submit to the engineer periodically as required to meet the requirements of these special provisions and in the plans.

Review of the balance calculations, counterweight details, and quantity and location of balance material does not relieve the contractor from making such changes in the counterweights and balance material as deemed necessary to balance the lift span. Submit all changes for approval.

After balance block adjustment, submit five copies of the final balance report, similar to the initial report to the engineer. Bind the reports between heavy plastic covers. Include an introductory section giving the name of the bridge, the bridge number, the date of the measurements, weather conditions during measurements, and any other information requested by the engineer.

D Measurement

The department will measure Counterweight Balancing Calculations, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.510	Counterweight Balancing Calculations	LS

Payment is full compensation for furnishing all analyses, professional engineer services, and all other balance work described herein or shown on the plans.

70. Temporary Lift Span Shoring, Item SPV.0105.511.

A Description

This special provision describes furnishing, installing or constructing, maintaining, and removing, temporary shoring for the lift span.

B Materials

Provide a shoring design for required temporary shoring. The shoring design shall include, but is not limited to; shoring location, shoring size, shoring spacing, anchorages required, minimum cribbing height, and removal procedure. The design shall include all necessary schematics to show sufficient detail of the shoring, which shall include but not be limited to; jacking equipment specifications, temporary structural elements, whalers, and temporary

foundation attachments necessary. During periods when the lift span is unbalanced, provide positive, sturdy supports, shoring, and/or false work to support the unbalanced loads. The design shall have the capacity to support the entire unbalanced load plus all additional loads resulting from wind forces, temporary erection forces, accumulations of snow, ice or dirt, or other loads or forces. The adequacy of each shoring design shall be verified by a professional engineer registered in the State of Wisconsin and knowledgeable of the specific site conditions and requirements. Submit to the department for documentation three copies of each shoring design that is signed and sealed by the same professional engineer verifying the design. It remains the contractor's responsibility to ensure that the lift span is adequately shored in a safe manner during all phases of erection and construction.

C Construction

Obtain permission from the U.S. Coast Guard at least one month in advance to close the river to navigation for periods of time sufficient to accomplish work that must be performed in the closed position. If any change is needed during construction, inform the U.S. Coast Guard a minimum two weeks in advance before making the change.

Construct or install the temporary shoring at the required location according to the designed developed and approved by the department and US Coast Guard.

Upon completion of the need for the temporary shoring the shoring must be removed as provided in the design. Any anchorages for the temporary shoring shall be removed. Any anchorages into concrete members shall be removed after use and patched according to standard spec 502.3.7.1.

D Measurement

The department will measure Temporary Lift Span Shoring, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.511	Temporary Lift Span Shoring	LS

Payment is full compensation for preparing Temporary Lift Span Shoring design and plans; for furnishing, installing or constructing, maintaining, and removing all temporary shoring; for preparing and submitting design to US Coast Guard for coordination and approval; for removing anchorages; for repair any damage caused by the shoring or anchorages; and for furnishing all equipment, tools, labor and incidentals necessary to complete the work according to the contract.

71. Lift Span Roadway Joints, Item SPV.0105.512.

A Description

This work shall consist of furnishing and installing the roadway section of the lift span joints according to the plans, standard specification, and these special provisions. This work shall include furnishing and installing joint plates, angles, channel sections, compression seals, and joint supports, including welded studs, as shown on the drawing for both the fixed and movable portion of the joints. This work will also include replacing the joint gutter and 6" wrought iron pipe at the joint with painted, hot-dipped galvanized components.

Removal of existing joint, including adjacent concrete deck, will be paid for under the bid item: "Removing Old Structure Over Waterway with Minimal Debris Station 40+36.34."

B Materials

Structural steel shall be painted hot-dipped galvanized and according to standard spec 506.

Galvanizing shall be according to ASTM A123 and A153.

Preformed elastomeric compression joint sealer shall be according to standard spec 502.2.8. The installation of the compression joint sealer shall be according to standard spec 506.3.6.3.2.

C (Vacant)

D Measurement

The department shall measure the Lift Span Roadway Joints, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.512	Lift Span Roadway Joints	LS

Payment is full compensation for furnishing, fabricating, and installing lift span roadway joints in conformance with the plans, standard specifications, and special provisions; and for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

72. Lift Span Sidewalk Joints, Item SPV.0105.513.

A Description

This work shall consist of furnishing and installing the sidewalk section of the lift span joints according to the plans, standard specifications, and special provisions. This work shall include furnishing and installing joint plates, angles, and channel sections including welded studs, compression seals, and joint supports as shown on the drawing for both the fixed and movable portion of the joints.

Removal of the existing joint, including adjacent concrete deck will be paid for under the bid item "Removing Old Structure Over Waterway with Minimal Debris Station 40+36.34."

B Materials

Structural Steel shall be painted hot dipped galvanized and according to standard spec 506.

Galvanizing shall be according to ASTM A123 and A153.

Preformed elastomeric compression joint sealer shall be according to standard spec 502.2.8. The installation of the compression joint sealer shall be according to standard spec 502.3.6.3.2.

C (Vacant)

D Measurement

The department shall measure the Lift Span Sidewalk Joints, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.513	Lift Span Sidewalk Joints	LS

Payment is full compensation for furnishing, fabricating and installing lift span sidewalk joints in conformance with the plans and this special provision; and for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

73. Refurbishing Existing Name Plates, Item SPV.0105.514.

A Description

The work under this item includes removing, cleaning, refurbishing, and reinstalling the existing nameplates from the bridge house.

B Materials

Provide anchoring devices of similar material to reinstall the existing name plates. New anchors shall be of a material that will not cause electrolysis between the two materials.

C Construction

Remove the existing nameplates prior to beginning any repair work on the bridge house. Do not reinstall until after all repair work has been completed and accepted by the engineer.

Thoroughly clean the removed nameplates of all paint, concrete, and other debris. Polish to an acceptable finish without damaging the name plates or removing or otherwise damaging the inscriptions on the nameplates and as shown in the plan. Cleaning shall be done to the satisfaction of the engineer.

Coat back of existing nameplates to prevent electrolysis from the attachment holes and staining of the concrete substrate. Reinstall at the original location on the bridge house. Use existing anchor bolts to reattach name plates.

D Measurement

The department will measure Refurbishing Existing Name Plates, completed according to the contract and accepted, as a single complete lump sum 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
SPV.0105.514	Refurbishing Existing Name Plates	LS

Payment is full compensation for removing, cleaning, and reinstalling existing name plates; and for furnishing all labor, tools, materials, and incidentals necessary to complete the work.

74. Name Plate, Item SPV.0105.515.

A Description

The work under this item consists of furnishing and installing a new special nameplate on the bridge house as shown on the plan and specified herein. Refer to the plans for the new nameplate size. Provide shop drawings, including rubbing, showing all names prior to casting/fabricating new nameplate, as well as anchoring, rosette and fastening details. Verify all names on new nameplate with engineer and city prior to casting/fabricating name plate.

B Materials

Provide the new nameplate and rosettes with details and dimensions as shown on the plans. Material shall be bronze, having the composition of aluminum/copper, with aluminum not more than 9%. Provide anchoring devices of similar material

C Construction

Locate new nameplate as shown on plan, or as directed by the engineer. Use anchoring details as shown in the plans. Drill holes in substrate. Set anchoring for nameplates per plan.

D Measurement

The department will measure Name Plate, 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
SPV. 0105.515	Name Plate	LS

Payment is full compensation for furnishing, fabricating and installing a new nameplate as specified; and for furnishing all labor, tools, materials, equipment, and incidentals necessary to complete the work.

75. Fiberglass Sidewalk Floor Plates, Item SPV.0165.501.

A Description

This special provision describes furnishing, fabricating, and installing fiberglass sidewalk plates, splice bars and stainless steel hardware as called for on the plans.

All items, details of construction, services or features not specifically mentioned which are regularly furnished in order to provide fiberglass sidewalk plates and stainless steel hardware shall be furnished at the square foot bid price and shall confirm in strength, quality and workmanship to that usually provided by the practice indicated in this specification.

B Materials

The fiberglass plates shall be of Extren Series 525 pultruded fiberglass sheet, as manufactured by Morrison Molded Fiber Glass Company, with the Duradek anti-skid surface, as applied by AFC, or equal with the following minimum properties.

Properties:

- | | |
|------------------------------|---|
| 1. Color | Haze Gray |
| 2. Resin | Isophthalic Polyester |
| 3. Fire Retardant Properties | Meets Class I Frame
Rating of 25 or less per ASTM E-84 |
| 4. Anti-Skid Surface | Permanently bonded grit
baked epoxy surface |

MINIMUM ULTIMATE COUPON PROPERTIES. Following are the required test results for the ultimate coupon properties as per the referenced ASTM procedures.

<u>PROPERTY</u>	<u>ASTM TEST</u>	<u>UNITS</u>	<u>THICKNESS</u>
Mechanical			3/8"-1"
Flexural stress, Flatwise LW	D790	psi	30,000
Flexural stress, Flatwise CW	D790	psi	18,000
Flexural Modulus, Flatwise LW	D790	1,000,000 psi	2
Flexural Modulus, Flatwise CW	D790	1,000,000 psi	1.4
Tensile Stress, LW	D638	psi	20,000
Tensile Stress, CW	D638	psi	10,000
Tensile Modulus, LW	D638	1,000,000 psi	1.8
Tensile Modulus, CW	D638	1,000,000 psi	1.4
Comprehensive Stress, Edgewise, LW	D695	psi	4,000
Comprehensive Stress, Edgewise, CW	D695	psi	20,000
Comprehensive Modulus, Edgewise LW	D695	1,000,000 psi	1.8

Comprehensive Modulus, Edgewise CW	D695	1,000,000 psi	1.0
Notched Izod Impact, LW	D256	ft-lbs/in. 20	
Notched Izod Impact, CW	D256	ft-lbs/in. 5	
Bearing Stress, LW	D953	psi	32,000
Bearing Stress, CW	D953	psi	32,000
Perpendicular Shear Stress, LW(1)	D3946	psi	6,000
Perpendicular Shear Stress, CW	D3946	psi	6,000
Poisson's Ratio, LW	---	in/in	0.31
Poisson's Ratio, CW	---	in/in	0.29

<u>PHYSICAL</u>	<u>ASTM TEST</u>	<u>UNITS</u>	<u>THICKNESS</u>
Barcol Hardness	---	---	40
24 Hr. Water Absorption (2)	D570	%Max	0.6
Density	D792	lbs/in(3)	.060-068
Coefficient of Thermal Expansion	D696	1,000,000	8.0in/in/°F

<u>ELECTRICAL</u>			
Arc Resistance	D495	seconds	120
Dielectric Strength, PF	D149	volts/mil	N.T.
Dielectric Strength, LW ¹	D149	KV/in	35
Dielectric Constant, PF	D150	@60Hz	5

LW = lengthwise

CW = crosswise

PF = perpendicular to the laminate face

N.T. = not tested

- American Society for Testing and Materials Designations. Reference to the American Society for Testing and Materials (ASTM) designations mentioned herein shall mean the latest particular ASTM specification and/or test procedure in effect at the time this bid is let.
- BRAND NAMES. 1. References. If articles have been identified in the bid by a "Brand Name" and Model number, such reference is intended to be descriptive, but not restrictive. Other items of equal description of articles that will be satisfactory. Other items of equal quality will be considered. Samples and/or demonstrations may be requested.

Submit a sample of the sidewalk plate for approval by the engineer with the shop drawing submittal.

C Construction

Use the Plan Drawings and these specifications to prepare shop drawing to deliver the products required to make a complete and acceptable sidewalk.

Fiberglass sheets to have gray-ultra-violet resistant polyurethane top coat.

Supply fiberglass plate, splice plates and stainless steel hardware according to sizes shown on the plans.

Fiberglass abrasive sidewalk plates shall be supplied with stainless bolts, washers and nuts, and fiberglass support bars 5 inches wide to transfer deflections between adjacent plates at the joint gaps. These support bars should have the longitudinal fibers in the 5 inches wide direction. For the sidewalk plates, the main fibers should be placed in the longitudinal direction of the span.

Stainless steel 1/2 inches diameter CTSK head screws, 1/2 inches nylon plug type key lock nuts, 1/2 inch washers and beveled washers shall be Ryerson and AISI Stainless Steel 304, or approved equal.

Drilled holes in fiberglass plates are to have a minimum edge distance equal to 1-1/2 inches measured from the center of the hole to the free edge of the material.

sFasteners for the non-metallic sidewalk plates shall comply with standard spec 513.2.2.5.

Bolts shall be socket type flat countersunk head cap screws, with washer and prevailing torque locking hex nuts.

The lock nuts shall be ANCO lock nuts with a locking pin as manufactured by Lok-Mor Inc. or an approved equal.

Pre-drill at the shop before delivery all holes where the plates are attached to adjacent plates and 5 inch splice plates. Field drill where the plates are attached to the supporting new hot dip galvanized(HGD) steel members and existing steel members. The splice plates shall be drilled in order that the smooth surface is up against the bottom of the walk plates.

Furnish sufficient fiberglass patch kits to patch all drilled holes and cuts to be made in the field.

Coat drilled holes in the supporting hot dipped galvanized steel members with cold galvanizing compound such as "ZRC."

Use the proper type of tools and methods to install and fabricate the fiberglass plates.

D Measurement

The department will measure the Fiberglass Sidewalk Floor Plates by square feet, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.501	Fiberglass Sidewalk Floor Plates	SF

Payment is full compensation for furnishing, fabricating and installing all fiberglass sidewalk floor plates in conformance with the plans and this special provision; and for furnishing all labor, materials, tools, equipments, and incidentals necessary to complete the work.

76. Metal Plates for Bike Lanes, Item SPV.0165.502.

A Description

This special provision describes the slip resistant perforated metal plates for bike lanes on top of steel grating as shown on the plans, and as herein after provided.

B Materials

Furnish 3/16" thick hot dip galvanized perforated steel plates for the bike lanes. The bond strength for the anti-slip, non gritted steel surface shall have a bond strength between surface and substrate according to ASTM C633: minimum of 4,000psi, or permanent bond. The coefficient of friction for anti-slip surface shall be a minimum of 0.8 for both wet and dry conditions.

Acceptable manufacturers of slip resistant surfaces include:

W.S. Molnar Company – Slipnot Grade 2, Steel
Ross Technology Corporation – Algrip, Steel
Or approved equal

Provide countersunk holes in bike plates for connection with the existing steel grating based on the field measurements. The contractor must perform a site visit to field measure existing grating prior to fabrication to ensure attachment hardware does not interfere with existing steel grating and supporting steel on the bascule span. Care must be taken to avoid any interaction with the bars on the existing steel grating. Use of a template (i.e. plastic or plywood) to confirm proposed hole location is recommended.

All associated attachment hardware shall be made of stainless steel. If hardware is not available as stainless steel it shall be hot dip galvanized.

C Construction

C.1 Shop Drawings

Prepare shop drawings showing details of the assembly and installation including plan views, cross sections, and elevations. Submit all data on paper measuring either 8-1/2 inch x 11 inch or 11-inch x 17-inch. Where appropriate, bind individual sheets into sets with a cover, title sheet, and table of contents.

C.2 Installation

Examine the areas to receive slip resistant metal plates before installation. Install the metal plates at locations indicated on the drawings and according to the product manufacturer's instructions. Install the metal plates as level, square, rigid with flush installation. The exterior edges of the metal plates shall be beveled and countersunk holes shall be used for attachment over the steel grating. Replace any defective or damaged slip resistance metal plates as directed by the engineer.

Any galvanized coating damaged during fabrications, transportation, or installation shall be repaired as specified in standard spec 635.3.1.

C.3 As-Built Drawings

Furnish final shop drawings in electronic format and hard copy. Also furnish a copy of all catalogue cuts, parts lists, operating and maintenance manuals, and other data required.

D Measurement

The department will measure Metal Plates for Bike Lanes per 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.0165.502	Metal Plates for Bike Lanes	SF

Payment is full compensation for supplying shop drawings, furnishing, fabricating, and installing Metal Plates for Bike Lanes in conformance with the plans and this special provision; and for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

77. Joint Sealing, Item SPV.0180.01.

A Description

This special provision describes the minimum requirements for preparing the pavement joints or cracks, and furnishing and installing the sealant. Seal all expansion, hand-formed, and sawed joints in the pavement. Also, seal all bond or construction joints.

B Materials

Furnish joint sealer that complies with the requirements of ASTM Designation D 3405. Joint sealer shall be composed of a mixture of materials that will form a resilient and adhesive compound capable of effectively sealing joints in concrete against the infiltration of moisture and foreign material throughout repeated cycles of expansion and contraction with temperature changes, and shall be of a mixture that will not flow from the joints or be picked up by vehicle tires at summer temperatures. The material must be capable of being brought to a uniform pouring consistency suitable for completely filling the joints without inclusion of large air holes or discontinuities.

The joint sealer shall be elastic type but poured, and it shall be melted by indirect heat in suitable equipment provided with positive temperature control and mechanical agitation. The material shall not be damaged when heated to the temperature required for satisfactory pouring.

C Construction

Prior to the installation of the joint sealer, clean the pavement joint or crack of all foreign material. Completely remove the slurry resulting from the sawing operations from the joint by blowing it clean with compressed air (using a minimum air pressure of 80 psi).

Only apply the joint sealer when the atmospheric and concrete temperatures are both above 40° F.

D Measurement

The department will measure Joint Sealing in area of pavement acceptably sealed by the contractor in square yards.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.01	Joint Sealing	SY

Payment is full compensation for furnishing and placing the joint sealant; cleaning the pavement joints and cracks; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

**ADDITIONAL SPECIAL PROVISION 1 (ASP 1)
FOR TRANSPORTATION ALLIANCE FOR NEW SOLUTIONS (TrANS)
PROGRAM EMPLOYMENT PLACEMENTS AND APPRENTICESHIPS**

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Section 5204(e) – Surface Transportation Workforce Development Training and Education, provides for 100 percent Federal funding if the core program funds are used for training, education, or workforce development purposes, including “pipeline” activities. The core programs includes: Congestion Mitigation and Air Quality Improvement (CMAQ) Program, Highway Bridge Program (HBP), Interstate Maintenance (IM), National Highway System (NHS), and Surface Transportation Program (STP). These workforce development activities cover surface transportation workers, including OJT/SS programs for women and minorities as authorized in 23 U.S.C. §140(b).

TrANS is an employment program originally established in 1995 in Southeastern Wisconsin. Currently TrANS has expanded to include TrANS program locations to serve contractors in Southeast (Milwaukee and surrounding counties), Southcentral (Dane County and surrounding counties including Rock County), and most Northeastern Wisconsin counties from locations in Keshena, Rhinelander and surrounding far Northern areas. TrANS attempts to meet contractor’s needs in other geographic locations as possible. It is an industry driven plan of services to address the outreach, preparation, placement and retention of women, minorities and non-minorities as laborers and apprentices in the highway skilled trades. These candidate preparation and contractor coordination services are provided by community based organizations. For a list of the TrANS Coordinators contact the Disadvantaged Business Enterprise Office at (414) 438-4583 in Milwaukee or (608) 266-6961 in Madison. These services are provided to you at no cost.

I. BASIC CONCEPTS

Training reimbursements to employing contractors for new placements, rehires or promotions to apprentice of TrANS Program graduates will be made as follows:

- 1) **On-the-Job Training, Item ASP.1T0G, ASP 1 Graduate.** At the rate of \$5.00 per hour on federal aid projects when TrANS graduates are initially hired, or seasonally rehired, as unskilled laborers or the equivalent.

Eligibility and Duration: To the employing contractor, for up to 2000 hours from the point of initial hire as a TrANS program placement.

Contract Goal: To maintain the intent of the Equal Employment Opportunity program, it is a goal that 6 (*number*) TrANS Graduate(s) be utilized on this contract.

- 2) **On-the-Job Training, Item ASP.1T0A, ASP 1 Apprentice.** At the rate of \$5.00 per hour on federal aid projects at the point when an employee who came out of the TrANS Program is subsequently entered into an apprenticeship contract in an underutilized skilled trade (this will include the Skilled Laborer Apprenticeship when that standard is implemented).

Eligibility and Duration: To the employing contractor, for the length of time the TrANS graduate is in apprentice status.

Contract Goal: To maintain the intent of the Equal Employment Opportunity program, it is a goal that 3 (number) TrANS Apprentice(s) be utilized on this contract.

- 3) The maximum duration of reimbursement is two years as a TrANS graduate plus time in apprentice status.
- 4) If a TrANS program is not available in the contractor's area and another training program is utilized, payment of On-the-Job Training hours may be approved by the Wisconsin Department of Transportation (WisDOT) if the training program meets the established acceptance criteria. Only On-the-Job Training Hours accumulated after WisDOT approval will be reimbursed as specified under Items ASP.1T0G and ASP.1T0A. For more information, contact the Disadvantaged Business Enterprise Office at the phone numbers listed above.
- 5) WisDOT reserves the right to deny payments under items ASP.1T0G and ASP.1T0A if the contractor either fails to provide training or there is evidence of a lack of good faith in meeting the requirements of this training special provision.

I. RATIONALE AND SPECIAL NOTE

The \$5.00 per hour now being paid for TrANS placements is intended to cover the duration of two years to allow for reaching entry-level laborer status. An additional incentive, the \$5.00 rate, would promote movement into the underutilized skilled trades' apprenticeships and applies until the individual completes their apprenticeship. These incentives benefit TrANS candidates by giving them a better opportunity to enter a skilled trade; benefits contractors who will be assisted in meeting their EEO profiles and goals; and benefits the public who will see the program reinforce larger public-private employment reform in Wisconsin. The pool of TrANS graduates was created for the purpose of addressing underutilization in the skilled trades, an objective that is further reinforced by a parallel retention pilot program, known as the Companywide Reporting. *Whether or not reimbursement is involved, the WisDOT reassures contractors who are in the Companywide Program that TrANS placements still contribute toward fulfilling the new hire goal of 50% women and minorities.* Based on data administered by United States Department of Labor (US DOL), the highway skilled trades remain underutilized for women statewide (less than 6.9%); and for minorities in all counties (% varies by county).

NOTE: *Unless using other advancement strategies, contractors are encouraged to use some or all of this monetary incentive to offset the cut in hourly wages an individual may incur when entering an apprenticeship if the full general laborer hourly rate has been previously paid. No special accounting measures are required.*

II. IMPLEMENTATION

The implementation of ASP 1 is intended to cover only the amount of time it takes for underutilization to be resolved across the trades. This will be measured annually at the county and/or state levels using data administered by WisDWD in relation to goals set by the USDOL-

OFCCP. With appropriate state and federal approvals, we may also do some measurement at the company level.

It is the contractor's responsibility to note on their Certified Payrolls if their employee is a TrANS graduate or a TrANS apprentice. The District EEO Coordinators utilize the information on the Certified Payrolls to track the hours accumulated by TrANS Graduates and TrANS apprentices on WisDOT contracts. Payment under this ASP 1 is made based on the hours recorded off of the Certified Payrolls. Tracking may eventually include improved linkages with the WisDWD apprentice database, information from company and committee level sources.

TrANS is nondiscriminatory by regulation, and is a tool for optional use by contractors to address the underutilization of women and minorities as laborers and apprentices in our industry's skilled trades.

IV. TRANS TRAINING

As part of the contractor's equal employment opportunity affirmative action program, training shall be provided to employees enrolled in apprenticeship and on-the-job training programs as follows:

The contractor shall provide on-the-job training aimed at developing full journey workers in the type of trade or job classifications involved. In the event the contractor subcontracts a portion of the contract work, the contractor shall determine how many, if any, of the trainees are to be trained by the subcontractor provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract.

Training and upgrading of minorities and women toward journey workers status is a primary objective of this training special provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority trainees and women trainees); to the extent such persons are available within a reasonable area of recruitment. The contractor will be given an opportunity and will be responsible for demonstrating the steps that they have taken in pursuance thereof, prior to determination as to whether the contractor is in compliance with this training special provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journey workers status or in which they have been employed as a journey worker. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the contractor's records should document the findings in each case.

V. APPRENTICESHIP TRAINING

The Federal Highway Administration's (FHWA) policy is to require full use of all available training and skill improvement opportunities to assure increased participation of minority groups, disadvantaged persons and women in all phases of the highway construction industry. The FHWA On-the-Job Training (OJT) Program requires the State transportation agencies (STAs) to establish apprenticeships and training programs targeted to move women, minorities, and disadvantaged individuals into journey-level positions to ensure that a competent workforce is available to meet highway construction hiring needs, and to address the historical underrepresentation of members of these groups in highway construction skilled crafts.

The OJT Supportive Services (OJT/SS) Program was established in Title 23 Code of Federal Regulations (CFR), Part 230) to supplement the OJT program and support STA training programs by providing services to highway construction contractors and assistance to highway construction apprentices and trainees. The primary objectives of OJT/SS are:

- (1) To increase the overall effectiveness of the State highway agencies' approved training programs.
- (2) To seek other ways to increase the training opportunities for women, minorities, and disadvantaged individuals.

The STAs are responsible for establishing procedures, subject to the availability of Surface Transportation and Bridge Funds under 23 U.S.C. §140(b) (Nondiscrimination), for the provision of supportive services with respect to training programs approved under 23 CFR, Part 230(a) (Equal Employment Opportunity on Federal and Federal-aid Construction Contracts – including Supportive Services).

The contractor and subcontractor shall maintain records to demonstrate compliance with these apprenticeship requirements. Reasonable exemptions and modifications to and from any or all of these requirements will be determined by the Wisconsin Department of Transportation-Civil Rights Office. A request for an exemption or modification, with justification, shall be made in writing, addressed to WisDOT Civil Rights Office, 4802 Sheboygan Avenue, P.O. Box 7965, Rm. 451, Madison, WI 53707.

ADDITIONAL SPECIAL PROVISION 3

DISADVANTAGED BUSINESS ENTERPRISE [DBE] PROGRAM IMPLEMENTATION

1. Description

- a. The federal DBE program requirements outlined in the Code of Federal Regulations at 49 CFR Part 26 apply to this Wisconsin Department of Transportation contract. WisDOT is a recipient of federal funds and this contract includes federal funds. United States Department of Transportation Federal DBE Program requires the following provisions:
 - (1) Pursuant to the federal DBE program regulation at 49 CFR Part 26, a contractor's failure to comply with any provision of the DBE regulations will be considered a material breach of contract. This is non-negotiable. If a contractor fails to carry out the DBE program and Title VI nondiscrimination requirements of its contracts, the following sanctions will be assessed depending upon the facts, reasoning, severity and remedial efforts of the contractor: termination of contract, withholding payment, assessment of monetary sanctions, assessment of liquidated damages and/or suspension/debarment proceedings that may result in the disqualification of the contractor from bidding for a designated period of time.
 - (2) The contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains the federal fund recipient's [DOT] written consent. Unless [WisDOT] consent is provided, the contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.
- b. The Wisconsin Department of Transportation [WisDOT] is committed to the compliant administration of the DBE Program. Each WisDOT Secretary affirms this commitment with his/her signed assurance.
<http://wisconsindot.gov/Documents/doing-bus/civil-rights/dbe/policy-statement.pdf>
 - (1) The department encourages the contractor to assist and develop DBE firms to become fully knowledgeable contractors to successfully perform on its contracts. Under the contract, the contractor agrees to provide the assistance to participating DBE's in the following areas:
 - i. Produce accurate and complete quotes.
 - ii. Understand highway plans applicable to their work.
 - iii. Understand specifications and contract requirements applicable to their work.
 - iv. Understand contracting reporting requirements.
 - (2) Wisconsin DOT identifies the assigned DBE goal in its contract advertisements and posts the contract DBE goal on the cover of the bidding proposal. The contractor can meet the assigned, specified contract DBE goal by subcontracting work to a DBE or by procuring services or materials from a DBE. The department calculates the DBE participation as the dollar value of DBE participation included in the bid expressed as a percentage of the total contract bid amount.
 - (3) For more comprehensive information on the disadvantaged business program, visit the department's Civil Rights and Compliance Section website at:
<http://wisconsindot.gov/Pages/doing-bus/civil-rights/dbe/default.aspx>

2. Definitions

Interpret these terms, used throughout this additional special provision, as follows:

- a. **Bid Percentage:** The DBE percentage indicated in the bidding proposal at the time of bid.
- b. **DBE:** A small business certified as disadvantaged business enterprise (DBE) under the federal DBE program and included on the Wisconsin UCP DBE Directory deemed ready, willing and able.
- c. **DBE goal:** The amount of DBE participation expected in the contract as shown on the cover of the Highway Work Proposal.
- d. **Manufacturer:** A firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract.
- e. **Supplier:** A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment required under the contract are bought, kept in stock, and regularly sold or leased to the public.
- f. **Voluntary Achievement:** The amount of DBE participation achieved and reported in the contract in excess of the assigned goal.

3. DBE Percentage Required at Bid Submission

Indicate the bid percentage (i.e. 0% through 100%) of DBE participation on the completed bidding proposal. For electronic submittals, show the percentage in the miscellaneous data folder, Item 3, DBE Percent. For paper submittals, show the percentage on the sheet included after the schedule of items. By submission of the bid, the bidder contractually commits to DBE participation at or above the bid percentage, or certifies that they have utilized comprehensive good faith efforts to solicit and utilize DBE firms to meet the DBE participation requirements of this contract proposal, and that the bid percentage is reflective of these good faith efforts. The bid percentage should demonstrate the efforts of the prime contractor prior to bid. If the bidder does not indicate the bid percentage of DBE participation on the completed bidding proposal, the department will consider the bid irregular and may reject the bid.

4. WisDOT Interpretation of Federal DBE Program Provision

Prime contractors must utilize the specific DBEs listed to perform the work and/or supply the materials for which each is listed on the Commitment to Subcontract to DBE Form [DT1506] and approved by WisDOT's DBE office to execute its contract. The approved Commitment to Subcontract to DBE Form [DT1506] becomes a contract document/record.

a. Department's DBE Evaluation Process

WisDOT evaluates DBE using the Commitment to Subcontract to DBE, payments to subcontractors and contract documentation. The prime contractor shall list the specific DBE certified firms and items of work s/he intends to use toward the fulfillment of the assigned DBE contract goal. The prime contractor receives DBE credit for payments made to the DBE firms performing the work listed on the approved Form DT1506.

b. Documentation Submittal

The contractor is to identify, by name, the DBE firms whose utilization is intended to satisfy this provision, the items of work of the DBE subcontract or supply agreement and the dollar value of those items of work by completing the Commitment to Subcontract to DBE Form [DT1506]. Effective January 1, 2017, the contractor will be required to submit the documentation within 5 business days after bid opening. All necessary supporting documentation including Attachment 'A' forms and/or Good Faith Efforts Form

[DT1202] must be submitted no later than 2 business days from contractor's initial submission of the DT 1506. The contractor must provide a signed Attachment 'A' form to the DBE office within the time limit in order to receive authorization for contract execution; the DBE office reserves the right accept alternate documentation in lieu of the signed form in extenuating circumstances. Documentation must be submitted to the DBE Office by email at DBE_Alert@dot.wi.gov (DBE_Alert@dot.wi.gov) or by postal mail ATTN: DBE Office, PO Box 7965, Madison, WI 53707-7965.

(1) **Bidder Meets DBE Goal**

If the bidder indicates that the contract DBE goal is met, after award and before execution, the department will evaluate the Commitment to Subcontract to DBE Form DT1506 and attachment A(s) to verify the actual DBE percentage calculation. If the DBE commitment is verified, the contract is eligible for execution with respect to the DBE commitment.

(2) **Bidder Does Not Meet DBE Goal**

- i. If the bidder indicates a bid percentage on the Commitment to Subcontract to DBE Form [DT1506] that does not meet the contract DBE goal, the bidder must submit a Good Faith Efforts Form [DT1202] and supporting documentation. After award and before execution, the department will evaluate the bidder's DBE commitment and consider the bidder's good faith efforts submission.
- ii. The department will evaluate the bidder's good faith effort request and notify the bidder of one of the following:
 - (a) If the department grants a good faith efforts, the bid is eligible for contract execution with respect to DBE commitment.
 - (b) If the department rejects the good faith efforts request, the department may declare the bid ineligible for execution. The department will provide a written explanation of why the good faith efforts request was rejected. The bidder may appeal the department's rejection as allowed under 7 a. & b.

c. **Bidder Fails to Submit Documentation**

If the contractor fails to furnish the Commitment to Subcontract to DBE Form [DT1506] within the specified time, the department may cancel the award. Delay in fulfilling this requirement is not a cause for extension of the contract time and shall not be used as a tool to delay execution.

5. Department's Criteria for Good Faith Effort

Appendix A of 49 CFR Part 26, is the guiding regulation concerning good faith efforts. However, the federal regulations do not explicitly define "good faith" but states that bidder must actively and aggressively attempt to meet the goal. The federal regulations are general and do not include every factor or effort that can be considered. As a result, each state must establish its own processes and consider the factors established in its own practices to create a process for making a determination of adequate good faith. WisDOT evaluates good faith on a contract basis just as each contract award is evaluated individually.

The department will only approve a contractor's good faith efforts if the bidder has made the effort, given the relevant circumstances under the contract that a bidder actively and aggressively seeking to meet the goal would make. The department will evaluate the bidder's good faith effort to determine whether a good faith efforts will be granted. The bidder must demonstrate, on the DT1202 that they have aggressively solicited DBE participation in an attempt to meet the contract DBE goal and attaining the stated DBE goal is not feasible.

- a. The department, in conjunction with industry stakeholders, has developed the following guidance for contractor good faith effort. The guidance and the attached appendices provide a framework for the actions required by all parties in the processing and evaluation of bidder's total efforts to achieve the project specific DBE goal prior to the bid letting date.

b. Prime Contractors should:

- (1) Document all efforts and decisions made toward achieving the DBE goal on the contract. The bidder should use the Civil Rights & Compliance System [CRCS] and related WisDOT- approved DBE outreach tools, including the Bid Express Small Business Network, to foster DBE participation on all applicable contracts.
- (2) Prime contractors may request assistance with DBE outreach and follow-up by contacting the department's DBE Support Services Office by phone or email request at least 14 days prior to the bid letting date. Requesting assistance with outreach is not a decisive factor in the review Good faith effort evaluation. Phone numbers are 414-438-4584 and/or 414-659-0487; Fax: 414-438-5392; E-mail: DOTDBESupportServices@dot.wi.gov.
- (3) Request quotes by identifying potential items to subcontract and solicit. Prime contractors are strongly encouraged to include in their initial contacts a single page including a detailed list of items for which they are accepting quotes, by project, within a letting. *See attached sample entitled "Sample Contractor Solicitation Letter" in Appendix A.* Prime contractors should also indicate a willingness to accept quotes in areas they are planning to perform themselves, as required by federal rules. In some cases, it might be appropriate to use DBE's to do work in a prime contractor's area of specialization.
 - i. Solicit quotes from certified DBE firms who match 'possible items to subcontract' using all reasonable and available means. Additionally, forward copies of solicitations highlighting the work areas for which you are seeking quotes to DOTDBESupportServices@dot.wi.gov.
 - ii. SBN is the preferred outreach tool. <https://www.bidx.com/wi/main>. Other acceptable means include postal mail, email, fax, phone call.
 - (a) Primes must ask DBE firms for a response in their solicitations. See *Sample Contractors Solicitation Letter* in Appendix. This letter can be included as an attachment to the SBN sub-quote request.
 - (b) Solicit quotes at least 10 calendar days prior to the letting date, at least two Fridays before the letting, to allow DBE firms sufficient time to respond. Prime contractors should contact DBE firms early, asking if they need help organizing their quote, assistance confirming equipment needs, or other assistance supporting their submission of a competitive quote for their services.
 - (c) Second solicitation should take place within 5 calendar days. Email and SBN are the preferred delivery of the follow-up solicitation.
 - iii. Upon request, provide interested DBE firms with adequate information about plans, specifications and the requirements of the contract by letter, information session, email, phone call and/or referral.
 - iv. When potential exists, the contractor should advise interested DBE firms on how to obtain bonding, line of credit or insurance if requested.
 - v. Document DBE firm's interest in quoting by taking appropriate steps to follow up initial solicitation with:
 - (a) Email to all prospective DBE firms in relevant work areas.
 - (b) Phone call log to DBE firms who express interest via written response or call.
 - (c) Fax/letter confirmation
 - (d) Signed copy of Bid Express SBN Record of Subcontractor Outreach Effort.

c. Evaluate DBE quotes Documentation is critical if a prime does not utilize the DBE firm's quote for any reason.

- (1) Evaluate DBE firm's capability to perform 'possible items to subcontract' using legitimate reasons, including but not limited to, **a discussion with the DBE firm** regarding its capabilities prior to the bid letting. If lack of capacity is your reason for not utilizing the DBE quote, you are required to contact the DBE by phone and email regarding their ability to perform the work indicated in the UCP directory listed as their work area by NAICS code. Only the work area and/or NAICS code listed in the UCP directory can be counted toward DBE credit. Documentation of the conversation is required.
- (2) In striving to meet an assigned DBE contract goal, prime contractors are expected to use DBE quotes that are responsive and reasonable. This includes DBE quotes that are not the low quote.

- (3) **Special Circumstance** - Evaluation of DBE quotes with tied bid items. "Tied quotes are the condition in which a subcontractor submits quotes including multiple areas of expertise across multiple work areas noting that the items and price are tied. Typically this type of quoting represents a cost saving to the prime but is not clearly stated as a discount; tied quotes are usually presented as 'all or none' quote to the prime." When non-DBE subcontractors submit tied bid items in their quotes to the prime, the DBE firms' quote may seem not competitive. In such a case, the following steps are taken in comparing the relevant quotes. These are qualitative examples.
- i. Compare bid items common to both quotes, noting the reasonableness in the price comparison.
 - ii. Review quotes from other firms for the bid items not quoted by the DBE firm to see if combining both can provide the same competitive advantage that the tied bid items offered.
- d. Immediately after notification of contract award, the prime submits all **'Commitment to Subcontract'** forms to the DBE Office. Prime contractor has 5 days to submit the completed form for the DBE firms it intends to use on the contract for DBE credit. If the goal is not met in full, the prime contractor must provide the following information along with WisDOT form DT1202: Certificate of Good Faith Efforts.
- (1) The names, addresses, e-mail addresses, telephone numbers of DBE's contacted. The dates of both initial and follow-up contact.
 - (2) A description of information provided to the DBE's regarding the plans, specifications, and estimated quantities for portions of the work to be performed by that DBE.
 - (3) Photocopies or electronic copies of all written solicitations to DBE's. A printed copy of SBN solicitation is acceptable.
 - (4) Documentation of each quote received from a DBE and, if rejected, the reason for that rejection.
 - (5) Bidder attendance at any pre-solicitation or pre-bid meetings the department held to inform DBE's of participation opportunities available on the project.

The prime contractor must obtain written consent from the DBE Office to change or replace any DBE firm listed on the approved Commitment to Subcontract to DBE Form [DT1506]. If the prime contractor utilizes another contractor, including the use of its own workforce, to perform the work assigned to a DBE on the approved DT1506, the prime contractor will not be entitled to payment for that work. Any changes to DBE after the approval of the DT1506 must be reviewed and approved by the DBE office prior to the change.

6. Use of Joint Checks

The use of joint checks is allowable if it is a commonly recognized business practice in the material industry. A joint check is defined as a two-party check between a DBE, a prime contractor and the regular dealer of materials supplier who is neither the prime nor an affiliate of the prime. Typically, the prime contractor issues one check as payor to the DBE subcontractor and to the supplier jointly (to guarantee payment to the supplier) as payment for the material/supplies used by the DBE in cases where the prime has submitted the DBE and material for DBE credit. The DBE subcontractor gains the opportunity to establish a direct contracting relationship with the supplier to potentially facilitate a business rapport that results in a line of credit or increased partnering opportunities.

The cost of material and supplies purchased by the DBE is part of the value of work performed by the DBE to be counted toward the goal. To receive credit, the DBE must be responsible for negotiating price, determining quality and quantity, ordering the materials, and installing (where applicable) and "paying for the material itself." See 49 CFR 26.55(c)(1).

The approval to use joint checks constitutes a commitment to provide further information to WisDOT, upon request by staff. WisDOT will allow the use of joint checks when the following conditions are met:

- a. The Prime must request permission to use joint checks from the DBE Office by submitting the Application to Use Joint Checks.
 - (1) Request should be made when the DBE Commitment form or Request to Sublet is submitted; the request will not be considered if submitted after the DBE Subcontractor starts its work.
 - (2) Approval/Permission must be granted prior to the issuance of any joint checks.
 - (3) The payment schedule for the supplier must be presented to the DBE office before the first check is issued.
 - (4) The joint check for supplies must be strictly for the cost of supplies.
- b. DBE subcontractor is responsible to furnish and/or install the material/work item. The DBE subcontractor shall not be an 'extra participant' in the transaction; the DBE's role in the transaction cannot be limited solely to signing the check(s) to release payment to the material supplier. At a minimum, the DBE subcontractor's tasks should include the following.
 - (1) The DBE subcontractor (not the prime/payor) negotiates the quantities, price and delivery of materials;
 - (2) The DBE subcontractor consents to sign/release the check to the supplier by signing the Application to Use Joint Checks after establishing the conditions and documentation of payment within the subcontract terms or in a separate written document.
- c. The Prime contractor/payor acts solely as a guarantor,
 - (1) The prime agrees to furnish the check used for the payment of materials/supplies under the contract.
 - (2) The prime contractor/payor cannot require the subcontractor to use a specific supplier or the prime contractors negotiated unit price.

7. Bidder's Appeal Process

- a. A bidder can appeal the department's decision to deny the bidder's good faith effort submission. The bidder must provide written documentation refuting the specific reasons for rejection as stated in the department's rejection notice. The bidder may meet in person with the department if so requested. Failure to appeal within 7 calendar days after receiving the department's written denial notice of a good faith effort evaluation constitutes a forfeiture of the bidder's right of appeal. A contract cannot be executed without documentation that the DBE provisions have been fulfilled.
- b. The department will appoint a representative, who did not participate in the original determination, to assess the bidder's appeal. The department will issue a written decision within 5 calendar days after the bidder presents all written and oral testimony. In that written decision, the department will explain the basis for finding that the bidder did or did not meet the contract DBE goal or make an adequate good faith effort to meet the contract DBE goal. The department's decision is final. If the department finds that the bidder did not meet the contract DBE goal or did not make adequate efforts to meet the DBE goal, the department may declare the bid ineligible for execution.

8. Department's Criteria for DBE Participation

Directory of DBE firms

- a. The only resource for DBE certified firms certified in the state of Wisconsin is the Wisconsin Unified Certification Program [UCP] DBE List. Wisconsin Department of Transportation maintains a current list of certified DBE firms titled Wisconsin UCP DBE Directory on the website at:
<http://wisconsindot.gov/Documents/doing-bus/civil-rights/dbe/dbe-ucp-directory.xlsx>
- b. The DBE office is also available to assist at 414-438-4583 or 608-267-3849.

9. Counting DBE Participation

Assessing DBE Work

- a. The department will only count the DBE usage towards the contract DBE goal if the DBE firm is certified as a DBE by one of the unified certification program agencies. If a firm becomes DBE certified before entering into a subcontract, the department may consider that DBE usage towards the contract goal. The department only counts the value of the work a DBE actually performs towards the DBE goal. The department assesses the DBE work as follows:
- b. The department counts work performed by the DBE's own resources. The department includes the cost of materials and supplies the DBE obtains for the work. The department also includes the cost of equipment the DBE leases for the work. The department will not include the cost of materials, supplies, or equipment the DBE purchases or leases from the prime contractor or its affiliate, except the department will count non-project specific leases the DBE has in place before the work is advertised.
- c. The department counts fees and commissions the DBE charges for providing a bona fide professional, technical, consultant, or managerial services. The department also counts fees and commissions the DBE charges for providing bonds or insurance. The department will only count costs the engineer deems reasonable based on experience or prevailing market rates.
- d. If a DBE subcontracts work, the department counts the value of the subcontracted work only if the DBE's subcontractor is also a DBE.
- e. The contractor shall maintain records and may be required to furnish periodic reports documenting its performance under this item.
- f. It is the prime contractor's responsibility to determine whether the work that is committed and/or contracted to a DBE certified firm can be counted for DBE credit by referencing the work type and NAICS code listed for the DBE firm on the Wisconsin UCP DBE Directory.
- g. It is the prime contractor's responsibility to assess the DBE firm's ability to perform the work for which s/he is committing/contracting the DBE to do. Note that the department encourages the prime contractor to assist and develop DBE firms to become fully knowledgeable contractors to successfully perform on its contracts.

10. Commercially Useful Function

- a. Commercially useful function is evaluated after the contract has been executed, while the DBE certified firm is performing its work items. A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved.
- b. The department uses Form DT1011: DBE Commercially Useful Function Review and Certification to evaluate whether the DBE is performing a commercially useful function. WisDOT counts expenditures of a DBE toward the DBE goal only if the DBE is performing a commercially useful function on that contract.
- c. A DBE is performing a commercially useful function if the following conditions are met:
 - (1) For contract work, the DBE is responsible for executing a distinct portion of the contract work and it is carrying out its responsibilities by actually performing, managing, and supervising that work.
 - (2) For materials and supplies, the DBE is responsible for negotiating price, determining quality and quantity, ordering, and paying for those materials and supplies.

11. Credit Evaluation for Trucking

All bidders are expected to adhere to the department's current trucking policy posted on the HCCI website at <http://wisconsindot.gov/Documents/doing-bus/civil-rights/dbe/trucking-utilization-policy.pdf>

12. Credit Evaluation for Manufacturers, Suppliers, Brokers

The department will calculate the amount of DBE credit awarded to a prime using a DBE firm for the provisions of materials and supplies on a contract-by-contract basis. The department will count the material and supplies that a DBE provides under the contract for DBE credit based on whether the DBE is a manufacturer, supplier or broker. Generally, DBE crediting measures and evaluates the DBE owner's role, responsibility and contribution to the transaction: maximum DBE credit when the DBE manufactures materials or supplies; DBE credit decreases when the DBE solely supplies material and minimal credit is allotted when the DBE's role is administrative or transactional.

It is the bidder's responsibility to find out if the DBE is considered a supplier or a manufacturer before listing them on Commitment to Subcontract to DBE form DT1506.

a. Manufacturers

- (1) A manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
- (2) If the materials or supplies are obtained from a DBE manufacturer, count **100%** percent of the cost of the materials or supplies toward DBE goals.

b. Regular Dealers of Material and/or Supplies

- (1) A regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.
- (2) If the materials or supplies are purchased from a DBE regular dealer, count **60%** percent of the cost of the materials or supplies toward DBE goals.
- (3) At a minimum, a regular dealer must meet the following criteria to be counted for DBE credit:
 - i. The DBE firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.
 - ii. The DBE firm must both own and operate distribution equipment for the product--bulk items such as petroleum products, steel, cement, gravel, stone, or asphalt. If some of the distribution equipment is leased, the lease agreement must accompany the DBE Commitment form for evaluation of the dealer's control before the DBE office approves the DBE credit.

c. Brokers, Transaction Expeditors, Packagers, Manufacturers Representatives

- (1) No portion of the cost of the materials, supplies, services themselves will count for DBE credit; however, WisDOT will evaluate the fees or commissions charged when a prime purchases materials, supplies or services from a DBE certified firm which is neither a manufacturer nor a regular dealer, namely: brokers, packagers, manufacturers' representatives or other persons who arrange or expedite transactions.
- (2) Brokerage fees have historically been calculated as **10%** of the purchase amount.
- (3) WisDOT may count the amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site.
- (4) The evaluation will review the contract need for the item/service, review the sub-contract or invoice for the item/service, compare the fees customarily allowed for similar services to determine whether they are reasonable.

When DBE suppliers are contracted, additional documentation must accompany the DT1506 and Attachment 'A' forms. An invoice or bill-of-sale that includes the company names of the bidder and the DBE supplier and documentation of the calculations used as the basis for the purchase agreement, subcontract or invoice.

WisDOT recognizes that the amount on the Attachment 'A' form may be more or less than the amount on the invoice. Please respond to the following questions and submit with your DBE Commitment Form.

1. What is the product or material?
2. Is this item in the prime's inventory or was the item purchased when contract was awarded?
3. Which contract line items were referenced to develop this quote?
4. What is the amount of material or product used on the project?

13. Credit Evaluation for DBE Primes

Wisconsin DOT calculates DBE credit based on the amount and type of work performed by DBE certified firms. If the prime contractor is a DBE certified firm, the department will only count the work that DBE prime contractor performs with its own forces for DBE credit. We will also calculate DBE credit for the work performed by any other DBE certified subcontractor, DBE certified supplier, DBE certified manufacturer on that contract in that DBE's approved work areas/NAICS code. Crediting for manufacturers and suppliers is calculated consistent with paragraph 12 of this document and 49 CFR Part 26.

14. Joint Venture

If a DBE performs as a participant in a joint venture, the department will only count that portion of the total dollar value of the contract equal to that portion of the work that the DBE performs with its own forces for DBE credit.

15. Mentor Protégé

- a. If a DBE performs as a participant in a mentor protégé agreement, the department will count for credit the portion of the work performed by the DBE protégé firm.
- b. DBE credit will be evaluated and confirmed by the DBE Office for any contracts on which the mentor protégé team identifies itself to the DBE Office as a current participant of the Mentor Protégé Program.
- c. Refer to WisDOT's Mentor Protégé guidelines for guidance on the number of contracts and amount of DBE credit that can be counted on any WisDOT project.

16. DBE Replacement or Termination

Contractual Requirement

The contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains written consent from the Department's DBE Office. If the Department does not provide consent to replace or terminate a DBE firm, the prime contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

Contractor Considerations

- a. A prime contractor cannot terminate and/or replace a DBE subcontractor listed on the approved Commitment to Subcontract to DBE Form [DT1506] without prior written consent from the DBE Office. This includes, but is not limited to, instances in which a prime contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

- b. If a prime contractor feels it is necessary to replace or terminate a DBE firm that has been approved for DBE credit toward its contract, s/he will be required to provide reasons and documentation to support why the prime cannot fulfill the contractual commitment that it made to the Department regarding the DBE utilization.
- c. Prime contractor is required to make affirmative efforts to find another DBE subcontractor to perform at least the same amount of work under the contract as the DBE that was terminated, to the extent needed to meet the assigned DBE contract goal.
- d. In circumstances when a DBE subcontractor fails to complete its work on the contract for any reason or is terminated from a contract, the prime contractor is expected to make affirmative efforts to maintain its commitment to the assigned DBE goal.
- e. The DBE firm should communicate with the prime contractor regarding its schedule and capacity in the context of the contract. If the DBE anticipates that it cannot fulfill its subcontract, s/he shall advise the prime contractor and suggest a DBE that may replace their services or provide written consent to be released from its subcontract.
 - (1) Before the prime contractor can request to terminate or substitute a DBE firm; s/he must:
 - i. Make every effort to fulfill the DBE commitment by working with the listed DBE to ensure that they are fully knowledgeable of your expectations for successful performance on the contract. Document these efforts in writing.
 - ii. If those efforts fail, provide written notice to the DBE subcontractor of your *intent* to request to terminate and/or replace the firm including the reason(s) you want to pursue this action.
 - iii. Copy the DBE Office on all correspondence related to changing a DBE firm who has been approved for DBE credit on a contract including the preparation and coordination efforts with the DBE on the contract.
 - iv. Clearly state the amount of time the DBE firm has to remedy and/or respond to your notice of intent to replace/terminate their firm from the contract. The DBE shall be allowed five days to respond, in writing. **EXCEPTION:** The prime contractor must provide a verifiable reason for a response period shorter than five days. For example a WisDOT project manager must verify that waiting 5 days for a DBE performing traffic control work to respond would affect the public safety.
 - v. The DBE subcontractor must forward a written response to the prime contractor and copy the DBE Office. The written response must outline why it objects to the proposed termination of its subcontract and list the reasons that WisDOT should not approve the request for their firm to be replaced or removed from the contract.

The Request to Replace or Terminate a DBE

The prime contractor must provide a written request to replace or terminate a DBE firm that has been approved for DBE credit on a WisDOT contract. The written request can be an email or printed document delivered by email or fax; at minimum, the request must contain the following:

1. Contract ID number.
2. Wisconsin DOT Contract Project Manager name and contact information.
3. DBE name and work type and/or NAICS code.
4. Contract's progress schedule.
5. Reason(s) for requesting that the DBE be replaced or terminated.
6. Attach/include all communication with the DBE to deploy/address/resolve work completion,

WisDOT will review your request and any supporting documentation that you submit to evaluate whether the circumstance and the reasons constitute a good cause for replacing or terminating the DBE that was approved for DBE credit on that contract.

Examples of Good Causes to Replace a DBE according to the federal DBE program guidelines {49 CFR part 26.53}

- The listed DBE subcontractor fails or refuses to execute a written contract.
- The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor.
- The listed DBE subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements.
- The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness.
- The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable state law.
- You have determined that the listed DBE subcontractor is not a responsible contractor.
- The listed DBE subcontractor voluntarily withdraws from the project and provides to you written notice of its withdrawal.
- The listed DBE is ineligible to receive DBE credit for the type of work required.
- A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract.

Evaluation and Response to the Request

If WisDOT determines that your reasons comply with the good cause standards; the DBE office will send the prime contractor and the WisDOT project manager an email stating that we concur with the reasons and approve the replacement or termination.

If WisDOT determines that your reasons do not comply with the good cause standards of the federal DBE program, the DBE Office will send the prime contractor an email that includes *the requirement* to utilize the committed DBE, *remedial actions* to support the completion of the contractual commitment, a list of available WisDOT support services *and administrative remedies that may be invoked* for failure to comply with federal DBE guidelines for DBE replacement.

The Wisconsin Department of transportation contact for all actions related to replacing a DBE is the DBE Program Chief and/or the DBE Program Engineer which can be reached at DBE_Alert@dot.wi.gov or by calling 608-267-3849.

17. DBE Utilization beyond the approved DBE Commitment Form DT1506

If the Prime/subcontractor increases the scope of work for a participating DBE or adds a DBE subcontractor that was not on the approved Form DT1506 at any time after contract award, s/he should follow these steps so that the participation can be accurately credited toward the DBE goal.

- a. Send an email to the DBE Engineer at DBE_Alert@dot.wi.gov describing the work to be performed by the new DBE including the proposed schedule or duration, DBE name and contact information. You may also call the DBE Engineer at 414-659-0487 to notify him of the change verbally.

If the scope change added work for a participating DBE; list the date and reason for the scope change.

- b. Forward a complete, signed Attachment 'A' form to the DBE Office at DBE_Alert@dot.wi.gov. A complete Attachment A includes DBE contact information, signature, subcontract value and proper description of the work areas to be performed by the DBE.

The DBE office will confirm the DBE participation and revise the DT1506 based on the email/discussion and attach the new/revised Attachment A to the Contract record/documentation.

18. Contract Modifications

When additional opportunity is available by contract modifications, the Prime Contractor shall utilize DBE Subcontractors that were committed to equal work items, in the original contract.

19. Payment

Costs for conforming to this Additional Special Provision (ASP) and any associated DBE requirements are incidental to the contract.

APPENDIX A

Sample Contractor Solicitation Letter Page 1

This sample is provided as a guide not a requirement

GFW SAMPLE MEMORANDUM

TO: DBE FIRMS
FROM: POTENTIAL PRIME CONTRACTOR OR MAJOR SUBCONTRACTOR
SUBJECT: REQUEST FOR DBE QUOTES
LET DATE & TIME
DATE: MONTH DAY YEAR
CC: DBE OFFICE ENGINEER

Our company is considering bidding on the projects indicated on the next page, as a prime and/or a subcontractor for the Wisconsin Department of Transportation Month- date -year Letting. Page 2 lists the projects and work items that we may subcontract for this letting. We are interested in obtaining subcontractor quotes for these projects and work categories. Also note that we are willing to accept quotes in areas we may be planning to perform ourselves as required by federal rules.

Please review page 2, respond whether you plan to quote, highlight the projects and work items you are interested in performing and return it via fax or email within 3 days. Plans, specifications and addenda are available through WisDOT at the DBE Support Services office or at the Highway Construction Contract Information (HCCI) site at

<http://roadwaystandards.dot.wi.gov/hcci/>

Your quote should include all of the costs required to complete the items you propose to perform including labor, equipment, material, and related bonding or insurance. The quote should note items that you are DBE certified to perform, tied items, and any special terms. Page 2, with the indicated projects and items you plan to quote, should be used as a cover sheet for your quote.

Please make every effort to have your quotes into our office by time deadline the prior to the letting date. **Make sure the correct letting date, project ID and proposal number, unit price and extension are included in your quote.** We prefer quotes be sent via SBN but prime's alternatives are acceptable. Our office hours are include hours and days. Please call our office as soon as possible prior to the letting if you need information/clarification to prepare your quote at contact number.

If you wish to discuss or evaluate your quote in more detail, contact us after the contract is awarded. Status of the contract can be checked at WisDOT's HCCI site at <http://roadwaystandards.dot.wi.gov/hcci/>

All questions should be directed to:

Project Manager, John Doe,

Phone: (000) 123-4567

Email: Joe@joetheplumber.com

Fax: (000) 123- 4657

Sample Contractor Solicitation Letter Page 2

This sample is provided as a guide not a requirement

REQUEST FOR QUOTATION

Prime's Name: _____
 Letting Date: _____
 Project ID: _____

Please check all that apply

- ☐ Yes, we will be quoting on the projects and items listed below
☐ No, we are not interested in quoting on the letting or its items referenced below
☐ Please take our name off your monthly DBE contact list
☐ We have questions about quoting this letting. Please have someone contact me at this number

Prime Contractor's Contact Person

DBE Contractor Contact Person

 Phone: _____
 Fax: _____
 Email: _____

 Phone: _____
 Fax: _____
 Email: _____

Please circle the jobs and items you will be quoting below

Proposal No.	1	2	3	4	5	6	7
County							

WORK DESCRIPTION:

Clear and Grub	X		X	X		X	X
Dump Truck Hauling	X		X	X		X	X
Curb & Gutter/Sidewalk, Etc.	X		X	X		X	X
Erosion Control Items	X		X	X		X	X
Signs and Posts/Markers	X		X	X		X	X
Traffic Control		X	X	X		X	X
Electrical Work/Traffic Signals		X	X	X		X	
Pavement Marking		X	X	X	X	X	X
Sawing Pavement		X	X	X	X	X	X
QMP, Base	X	X		X	X	X	X
Pipe Underdrain	X			X			
Beam Guard				X	X	X	X
Concrete Staining							X
Trees/Shrubs	X						X

Again please make every effort to have your quotes into our office by time deadline prior to the letting date.

We prefer quotes be sent via SBN but prime's preferred alternatives are acceptable.

If there are further questions please direct them to the prime contractor's contact person at phone number.

APPENDIX B

BEST PRACTICES FOR PRIME CONTRACTOR & DBE SUBCONTRACTOR GOOD FAITH EFFORT

This list is not a set of requirements; it is a list of potential strategies

Primes

- Prime contractor open houses inviting DBE firms to see the bid “war room” or providing technical assistance.
- Participate in speed networking and mosaic exercises as arranged by DBE office.
- Host information sessions not directly associated with a bid letting.
- Participate in a formal mentor protégé or joint venture with a DBE firm.
- Participate in WisDOT advisory committees i.e. TRANSAC, or Mega Project committee meetings.
- Facilitate a small group DBE ‘training session’ Clarifying how your firm prepares for bid letting, evaluates subcontractors, preferred qualifications and communication methods.
- Encourage subcontractors to solicit and highlight DBE participation in their quotes to you.
- Quality of communication, not quantity creates the best results. Contractors should do as thorough a job as possible in communicating with DBE firms before the bid and provide any assistance requested to assure best possible bid.

DBE

- DBE firms should contact primes as soon as possible with questions regarding their quotes or bid; seven days prior is optimal.
- Continually check for contract addendums on the HCCI website through the Thursday prior to letting to stay abreast of changes.
- Review the status of contracts on the HCCI website reviewing the ‘apparent low bidder’ list, and bid tabs at a minimum.
- Prepare a portfolio or list of related projects and prime and supplier references; be sure to note transportation-related projects of similar size and scope, firm expertise and staffing.
- Participate in DBE office assessment programs.
- Participate on advisory and mega-project committees.
- Sign up to receive the DBE Contracting Update.
- Consider membership in relevant industry or contractor organizations.
- Active participation is a must. Quote as many projects as you can reasonably work on; quoting the primes and bidding as a prime with the department are the only ways to get work.

APPENDIX C

Types of Efforts considered in determining GFE

This list represents concepts being assessed; analysis requires additional steps

1. Whether the contractor attended any pre-solicitation or pre-bid meetings that were scheduled by WisDOT to inform DBEs of contracting and subcontracting opportunities.
2. Whether the contractor provided written notice to a reasonable number of specific DBEs that their interest in the contract was being solicited, in sufficient time to allow the DBEs to participate effectively.
3. Whether the contractor followed up initial solicitations of interest by contacting DBEs to determine if the DBEs were interested; returned the phone calls of interested DBE firms.
4. Whether the contractor selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the DBE goal.
5. Whether the contractor provided interested DBEs with adequate information about the plans, specifications and requirements of the contract.
6. Whether the contractor negotiated in good faith with interested DBEs, not rejected DBEs as unqualified without sound reasons based on a thorough investigation of their capabilities.
7. Whether the contractor made efforts to assist interested DBEs in being more competitive.
8. Whether the contractor effectively used the services of available minority community organizations: minority contractors groups, local, state, and Federal minority business assistance offices, and other organizations that provide assistance to small businesses and DBE firms.
9. Whether Prime used CRCS to identify DBE who specialize in relevant work areas.
10. Whether the contractor used available resources including contacting the DBE office, using WisDOT's website
11. Whether the contractor returned calls of firms expressing interest in a timely manner.

APPENDIX D

Good Faith Effort Evaluation Guidance

Excerpt from Appendix A of 49 CFR Part 26

APPENDIX A TO PART 26 -- GUIDANCE CONCERNING GOOD FAITH EFFORTS

- I. When, as a recipient, you establish a contract goal on a DOT assisted contract, a bidder must, in order to be responsible and/or responsive, make good faith efforts to meet the goal. The bidder can meet this requirement in either of two ways. First, the bidder can meet the goal, documenting commitments for participation by DBE firms sufficient for this purpose. Second, even if it doesn't meet the goal, the bidder can document adequate good faith efforts. This means that the bidder must show that it took all necessary and reasonable steps to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not fully successful.
- II. In any situation in which you have established a contract goal, part 26 requires you to use the good faith efforts mechanism of this part. As a recipient, it is up to you to make a fair and reasonable judgment whether a bidder that did not meet the goal made adequate good faith efforts. It is important for you to consider the quality, quantity, and intensity of the different kinds of efforts that the bidder has made. The efforts employed by the bidder should be those that one could reasonably expect a bidder to take if the bidder were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE contract goal. Mere pro forma efforts are not good faith efforts to meet the DBE contract requirements. We emphasize, however, that your determination concerning the sufficiency of the firm's good faith efforts is a judgment call: meeting quantitative formulas is not required.
- III. The Department also strongly cautions you against requiring that a bidder meet a contract goal (i.e., obtain a specified amount of DBE participation) in order to be awarded a contract, even though the bidder makes an adequate good faith efforts showing. This rule specifically prohibits you from ignoring bona fide good faith efforts.
- IV. The following is a list of types of actions which you should consider as part of the bidder's good faith efforts to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.
 - A. Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.
 - B. Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.
 - C. Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
 - D.
 - (1) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.
 - (2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a

contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Prime contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

- E. Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non solicitation of bids in the contractor's efforts to meet the project goal.
 - F. Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.
 - G. Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
 - H. Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.
- V. In determining whether a bidder has made good faith efforts, you may take into account the performance of other bidders in meeting the contract. For example, when the apparent successful bidder fails to meet the contract goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts, the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the goal, but meets or exceeds the average DBE participation obtained by other bidders, you may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made good faith efforts.

Appendix E

Small Business Network [SBN] Overview

The Small Business Network is a part of the Bid Express® service that was created to ensure that prime bidders have a centralized online location to find subs - including small and disadvantaged business enterprises (DBEs). It is available for prime bidders to use as part of their Basic Service subscription.

Within the Small Business Network, **Prime Contractors** can:

1. Easily select proposals, work types and items:
 - a. After adding applicable work types, select items that you wish to quote. Enter the sub-quote quantities and add comments, if desired. Adding or removing items and work types can be done quickly. If needed, you can save the sub-quote for completion at a later time.
2. Create sub-quotes for the subcontracting community:
 - a. Create sub-quotes with ease using the intuitive sub-quote creator. In seven short steps, you can rapidly create a custom sub-quote directed to all subcontractors that bid on the applicable work types. Steps include: provide contact information and sub-quote expiration date, select letting and proposal, add work types and items, specify terms and conditions, upload attachments, and select vendors.
 - b. Create a sub-quote to send to subcontractors or suppliers that lists the items in a proposal that you want quoted
 - c. Create an unlimited number of sub-quotes for items you want quoted, and optionally mark them as a DBE-preferred request.
 - d. Add attachments to sub-quotes.
3. View sub-quote requests & responses:
 - a. After logging into the Bid Express service, you can quickly review all of your sub-quote requests and all unsolicited sub-quote requests from subcontractors. To simplify the Small Business Network home screen, sub-quote requests can be hidden with one click if they are not applicable.
 - b. View or receive unsolicited sub-quotes that subcontractors have posted, complete with terms, conditions and pricing.
4. View Record of Subcontractor Outreach Effort:
 - a. For each sub-quote produced, a *Record of Subcontractor Outreach Effort* is generated that shows the response statistics for a particular sub-quote. If accepted by the letting agency, this report may serve as proof of a “Good Faith” effort in reaching out to the DBE community.
 - b. Easily locate pre-qualified and certified small and disadvantaged businesses.
 - c. Advertise to small and disadvantaged businesses more efficiently and cost effectively.
 - d. Document your interactions with subs/DBEs by producing an Outreach Report (may be accepted as proof of DBE outreach at the discretion of each agency).

The Small Business Network is a part of the Bid Express® service that was created to ensure that small businesses have a centralized area to access information about upcoming projects. It can help small businesses learn more about opportunities, compete more effectively, network with other contractors and subcontractors, and win more jobs.

1. View and reply to sub-quote requests from primes:
 - a. After logging into the Bid Express service, you can quickly review all incoming sub-quote requests and all unsolicited sub-quotes created by your company. Receive notifications by selected work type. To simplify on the Small Business Network home screen, sub-quote requests can be filtered by work types relevant to your interests, or hidden with one click if they are not applicable.
2. Select items when responding to sub-quote requests from primes:
 - a. You have the freedom to choose and price any number of items when responding to a sub-quote request. Quantities can be modified, and per-item comments are also available.
 - b. View requests for sub-quotes for work that primes have posted for projects they are bidding, add your pricing, terms, and conditions, and submit completed sub-quotes to the requesting primes.
 - c. Add attachments to a sub-quote.
3. Create and send unsolicited sub-quotes to specific contractors:
 - a. Create unsolicited sub-quotes with ease using the intuitive sub-quote creator. In eight short steps, you can rapidly create a custom sub-quote directed at any number of specific vendors of your choosing. Steps include: provide contact information and sub-quote expiration date, select letting and proposal, add work types and items, specify terms and conditions, upload attachments, and select vendors.
4. Easily select and price items for unsolicited sub-quotes:
 - a. After adding applicable work types, select items that you wish to quote. The extended price calculates automatically, cutting out costly calculation errors. Comments can be provided on a per-item basis as well.
 - b. Create an unsolicited sub-quote that lists the items from a proposal that you want to quote, include pricing, terms and conditions, and send it to selected prime/plan holder.
 - c. Add attachments to a sub-quote.
 - d. Add unsolicited work items to sub-quotes that you are responding to.
5. Easy Access to Valuable Information
 - a. Receive a confirmation that your sub-quote was opened by a prime.
 - b. View Bid Tab Analysis data from past bids, including the high, average and low prices of items.
 - c. View important notices and publications from DOT targeted to small and disadvantaged businesses.
6. Accessing Small Business Network for WisDOT contracting opportunities
 - a. If you are a contractor not yet subscribing to the Bid Express service, go to www.bidx.com and select “Order Bid Express.” The Small Business Network is a part of the Bid Express Basic Service.
 - b. DBE firms can request a Bid Express Small Business Network Account at no cost by calling 414-438-4588.

ADDITIONAL SPECIAL PROVISION 4

Payment to First-Tier Subcontractors

Within 10 calendar days of receiving a progress payment for work completed by a subcontractor, pay the subcontractor for that work. The prime contractor may withhold payment to a subcontractor if, within 10 calendar days of receipt of that progress payment, the prime contractor provides written notification to the subcontractor and the department documenting "just cause" for withholding payment.

The prime contractor may also withhold routine retainage from payments due subcontractors.

Payment to Lower-Tier Subcontractors

Ensure that subcontracting agreements at all tiers provide prompt payment rights to lower-tier subcontractors that parallel those granted first-tier subcontractors in this provision.

Release of Routine Retainage

After granting substantial completion the department may reduce the routine retainage withheld from the prime contractor to 75 percent of the original total amount retained.

When the Department sends the semi-final estimate the department may reduce the routine retainage withheld from the prime contractor to 10 percent of the original total amount retained.

Within 30 calendar days of receiving the semi-final estimate from the department, submit written certification that subcontractors at all tiers are paid in full for acceptably completed work and that no routine retainage is being withheld. The department will pay the prime contractor in full and reduce the routine retainage withheld from the prime contractor to zero when the department approves the final estimate.

This special provision does not limit the right of the department, prime contractor, or subcontractors at any tier to withhold payment for work not acceptably completed or work subject to an unresolved contract dispute.

ADDITIONAL SPECIAL PROVISION 6

ASP 6 - Modifications to the standard specifications

Make the following revisions to the standard specifications:

104.10.1 General

Replace paragraph four with the following effective with the December 2017 letting:

- (1) Subsection 104.10 specifies a 2-step process for contractors to follow in submitting a cost reduction incentive (CRI) for modifying the contract in order to reduce direct construction costs computed at contract bid prices. The initial submittal is referred to as a CRI concept and the second submittal is a CRI proposal. The contractor and the department will equally share all savings generated to the contract due to a CRI as specified in 104.10.4.2(1). The department encourages the contractor to submit CRI concepts.

104.10.4.2 Payment for the CRI Work

Replace paragraph four with the following effective with the December 2017 letting:

- (1) The department will pay for completed CRI work as specified for progress payments under 109.6. The department will pay for CRI's under the Cost Reduction Incentive administrative item. When all CRI costs are determined, the department will execute a contract change order that does the following:
1. Adjusts the contract time, interim completion dates, or both.
 2. Pays the contractor for the unpaid balance of the CRI work.
 3. Pays the contractor 50 percent of the net savings resulting from the CRI, calculated as follows:

$$NS = CW - CRW - CC - DC$$

Where:

NS = Net Savings

CW = The cost of the work required by the original contract that is revised by the CRI. CW is computed at contract bid prices if applicable.^[1]

CRW = The cost of the revised work, computed at contract bid prices if applicable.^[1]

CC = The contractor's cost of developing the CRI proposal.

DC = The department's cost for investigating, evaluating, and implementing the CRI proposal.

^[1] The department may adjust contract bid prices that, in the engineer's judgement, do not represent the fair value of the work deleted or proposed.

108.11 Liquidated Damages

Replace paragraphs two and three with the following effective with the December 2017 letting:

- (2) This deducted sum is not a penalty but is a fixed, agreed, liquidated damage due the department from the contractor for the added cost of engineering and supervision resulting from the contractor's failure to complete the work within the contract time.
- (3) Unless enhanced in the special provisions, the department will assess the following daily liquidated damages

LIQUIDATED DAMAGES			
ORIGINAL CONTRACT AMOUNT		DAILY CHARGE	
FROM MORE THAN	TO AND INCLUDING	CALENDAR DAY	WORKING DAY
\$0	\$250,000	\$850	\$1700
\$250,000	\$500,000	\$815	\$1630
\$500,000	\$1,000,000	\$1250	\$2500
\$1,000,000	\$2,000,000	\$1540	\$3080
\$2,000,000	—	\$2070	\$4140

- (1) Operate profilers within the manufacturer's recommended speed tolerances. Perform 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.
-

203.3.2.2 Removal Operations

Replace the entire text with the following effective with the December 2017 letting:

203.3.2.2.1 General

- (1) Except as specified below for closing culverts, remove the entire top slab of box culverts and the entire superstructure of other culverts and bridges designated for removal. Completely remove existing piles, cribs, or other timber construction within the limits of new embankments, or remove these structures to an elevation at least 2 feet below finished ground line. Remove sidewalls or substructure units in water to an elevation no higher than the elevation of the natural stream or lake bed, or, if grading the channel is required under the contract or the plans, to the proposed finished grade of the stream or lake bed. Remove sidewalls or substructure units not in water down to at least 2 feet below natural or finished ground line.
- (2) If extending or incorporating existing culverts and bridges in the new work, remove only those parts of the existing structure as necessary to provide a proper connection to the new work. Saw, chip, or trim the connecting edges to the required lines and grades without weakening or damaging the remaining part of the structure. During concrete removal, do not damage reinforcing bars left in place as dowels or ties incorporated into the new work.
- (3) Remove pipe culverts designated for salvage in a way that prevents damage to the culverts.
- (4) Dismantle steel structures or parts of steel structures designated for salvage in a way that avoids damage to the members. If the contract specifies removing the structure in a way that leaves it in a condition suitable for re-erection, matchmark members with durable white paint before dismantling. Mark pins, bolts, nuts, loose plates, etc., similarly to indicate their proper location. Paint pins, bolts, pinholes, and machined surfaces with a department-approved rust preventative. Securely wire loose parts to adjacent members, or label and pack them in boxes.
- (5) Remove timber structures or parts of timber structures designated for salvage in a way that prevents damage to the members.
- (6) If the engineer approves, the contractor may temporarily use materials designated for salvage in falsework used to construct new work. Do not damage or reduce the value of those materials through temporary use.

203.3.2.2.2 Deck Removal

- (1) Protect the work as specified in 107.14 during deck removal. Minimize debris falling onto water surfaces and wetlands as the contract specifies in 107.18 or in the special provisions. Also, minimize debris falling on the ground and roadway.
- (2) Do not damage existing bar steel reinforcement, girders, or other components that will be incorporated in new work. Remove decks on prestressed concrete girders using a hydraulic shear or other engineer-approved equipment. Thoroughly clean, realign, and retie reinforcement as necessary.
- (3) After deck removal is complete, notify the engineer to request a damage survey. Point out damage to the engineer. Allow one business day for the engineer to complete the damage survey. If damage is identified, the department will determine if repairs or girder restoration will be allowed.
- (4) If the department allows girder restoration, have a professional engineer registered in the State of Wisconsin analyze the effect of the damage to the bridge, make recommendations, and prepare signed and sealed computations and structural details required to restore girders to their previous structural capacity. Submit the restoration proposal, including analysis and structural details, to the department and design engineer of record. The department will accept or reject the restoration proposal within 3 business days. Do not begin restoration work until the department allows in writing.
- (5) The engineer will not extend contract time to assess or remediate contractor caused damage.

203.5.1 General

Replace the entire text with the following effective with the December 2017 letting:

- (2) Payment is full compensation for breaking down and removing; costs associated with contractor-caused damage; required salvaging, storing, and disposing of materials; and, unless the contract specifies granular backfill, for backfilling.
-

415.2.3 Expansion Joint Filler

Replace paragraph one with the following effective with the December 2017 letting:

- (1) Furnish expansion joint filler conforming to AASHTO M153, AASHTO M213, ASTM D7174, or ASTM D8139 in lengths equal to the pavement lane width and of the thickness and height the plans show. Where dowel bars are required, use filler with factory-punched holes at the dowel bar locations and with a diameter not greater than 1/8 inch larger than the nominal dowel bar diameter.
-

415.3.20 Filling Joints

Replace paragraph two with the following effective with the December 2017 letting:

- (2) Clean joints of laitance, curing compound, and other contaminants before filling. Saw construction joints at least 3/4 inches deep before filling. Sawing is not required for tooled joints in curb and gutter. Sandblast or waterblast exposed joint faces using multiple passes as required to clean joint surfaces of material that might prevent bonding. Blow clean and dry with oil-free compressed air immediately before filling.
- =====
-

415.5.1 General

Replace paragraph two with the following effective with the December 2017 letting:

- (6) Payment for Concrete Pavement Joint Filling is full compensation for filling concrete pavement joints; filling adjacent curb and gutter joints; and for sawing.
-

440.3.4.2 Contractor Testing

Replace paragraph two with the following effective with the December 2017 letting:

- (2) Coordinate with the engineer at least 24 hours before making profile runs for acceptance unless the engineer approves otherwise. The department may require testing to accommodate staged construction or if corrective action is required.
-

502.2.7 Preformed Joint Filler

Replace paragraph one with the following effective with the December 2017 letting:

- (1) Use preformed joint filler conforming to AASHTO M153, AASHTO M213, ASTM D7174, or ASTM D8139.
-

502.3.7.8 Floors

Replace paragraph fourteen with the following effective with the December 2017 letting:

- (14) Unless specified otherwise, transversely tine finish the floors of structures with approach pavements designed for speeds of 40 mph or greater as specified in 415.3.8.3, except make the tining 1/8 inch in depth and do not perform tining within 12 inches of gutters. The contractor may apply a broom finish, described below, instead of the artificial turf drag finish required before tining. The contractor may perform tining manually, if it obtains a finish satisfactory to the engineer. Perform tining within 20 degrees of the centerline of bearing of the substructure units on bridge decks having skew angles of 20 degrees or greater.

614.2.1 General

Add the following as paragraph ten effective with the December 2017 letting:

- (10) Furnish guardrail reflectors from the department's APL.

614.3.2.1 Installing Posts

Add the following as paragraph five effective with the December 2017 letting:

- (5) Provide post-mounted reflectors every 100 feet with one at the beginning and end of each run and a minimum of three reflectors per run.

614.5 Payment

Replace paragraph four with the following effective with the December 2017 letting:

- (4) Payment for the Steel Thrie Beam, Steel Plate Beam Guard, Guardrail Stiffened, MGS Guardrail, Short Radius, and various transition bid items is full compensation for providing guardrail and transitions including post-mounted reflectors; for repairing damaged zinc coatings; and for excavating, backfilling, and disposing of surplus material.

641.2.9 Overhead Sign Supports

Replace paragraph three with the following effective with the December 2017 letting:

- (3) Provide steel pole shafts, mast arms or trusses, and luminaire arms zinc coated according to ASTM A123. The contractor may provide either straight or tapered pole and arm shafts unless the plans specify otherwise. Provide bolts and other hardware conforming to 641.2.2.

642.2.2.1 General

Replace the entire text with the following effective with the December 2017 letting:

- (1) Provide each field office with two rooms, separated by an interior door with a padlock. Ensure that each room has a separate exterior door and its own air conditioner. Locate the office where a quality internet connection can be achieved.
- (2) Provide long distance telephone service via a land line for exclusive department use that has the following:
 - Two programmable touch-tone phones, one of which is cordless. Ensure that phone operations will not interfere with other telecommunications equipment.
 - Voice mail service or an answering machine.
- (3) Provide high-speed internet service for exclusive department use via cable or DSL connection with a modem/router and capable of supporting cloud enabled file sharing, voice over internet protocol (VoIP), video conferencing, and web based applications. Ensure that system meets the following:
 - Includes a wireless network for the field office.
 - Can accommodate IPsec based VPN products.
 - Has a bandwidth range as follows:

Field office with 1-5 staff:	A minimum connection speed of 5 Mbps download and 1 Mbps upload. If a cable or DSL option is not available the contractor may provide a personal hotspot using cell phone tethering or other device able to achieve the specified minimum speeds inside the field office.
Field office with 6 or more staff:	A minimum connection speed of 10 Mbps + 1/2 Mbps per user download and 5 Mbps upload.
Projects over 500 million dollars:	A minimum connection speed of 20 Mbps + 1/2 Mbps per user download and 10 Mbps upload. Coordinate network setup at the leased office with the WisDOT network team.
- (4) Provide and maintain a Windows 7 and Windows 10 compliant multi-function device with copy, print, and scan capabilities that can accommodate both 8 1/2" x 11" and 11" x 17" paper. Replenish paper, toner cartridges, and other supplies before fully expended. Ensure that department staff can connect to the device either directly or through the field office wireless network.

- (5) Equip with a drafting table with a drafter's stool. Except as specified in 642.2.2.4, provide 2 ergonomically correct office chairs in working condition with, at a minimum, the following:
1. Five-legged base with casters.
 2. Seat adjustable from 15 to 22 inches from the floor with a seamless waterfall, rounded, front edge.
 3. High backrest with no arms or adjustable arms.

645.2.2.2 Geotextile, Type SAS (Subgrade Aggregate Separation)

Replace paragraph one with the following effective with the December 2017 letting:

- (1) Furnish fabric conforming to the following physical properties:

TEST	METHOD	VALUE ^[1]
Minimum grab tensile strength	ASTM D4632	170 lb
Minimum puncture strength	ASTM D6241	350 lb
Maximum apparent opening size	ASTM D4751	No. 70
Minimum permittivity	ASTM D4491	0.35 s ⁻¹

^[1] All numerical values represent minimum/maximum average roll values. Average test results from all rolls in a lot must conform to the tabulated values.

645.2.2.4 Geotextile, Type DF (Drainage Filtration)

Replace paragraph one with the following effective with the December 2017 letting:

- (1) Furnish fabric conforming with the physical requirements of either schedule A, schedule B, or schedule C as the contract specifies.

SCHEDULE A TEST	METHOD	VALUE ^[1]
Minimum grab tensile strength	ASTM D4632	110 lb
Minimum puncture strength	ASTM D6241	200 lb
Minimum apparent breaking elongation	ASTM D4632	30%
Maximum apparent opening size	ASTM D4751	300 µm
Minimum permittivity	ASTM D4491	0.70 s ⁻¹

SCHEDULE B TEST	METHOD	VALUE ^[1]
Minimum grab tensile strength	ASTM D4632	180 lb
Minimum puncture strength	ASTM D6241	350 lb
Minimum apparent breaking elongation	ASTM D4632	30%
Maximum apparent opening size	ASTM D4751	300 µm
Minimum permittivity	ASTM D4491	1.35 s ⁻¹

SCHEDULE C TEST	METHOD	VALUE ^[1]
Minimum grab tensile strength	ASTM D4632	180 lb
Minimum puncture strength	ASTM D6241	350 lb
Minimum apparent breaking elongation	ASTM D4632	15%
Maximum apparent opening size	ASTM D4751	600 µm
Minimum permittivity	ASTM D4491	1.00 s ⁻¹

^[1] All numerical values represent minimum/maximum average roll values. Average test results from all rolls in a lot must conform to the tabulated values.

645.2.2.6 Geotextile, Type R (Riprap)

Replace paragraph one with the following effective with the December 2017 letting:

- (1) Use fabric conforming to the following physical properties:

TEST	METHOD	VALUE ^[1]
Minimum grab tensile strength	ASTM D4632	205 lb
Minimum puncture strength	ASTM D6241	400 lb
Minimum apparent breaking elongation	ASTM D4632	15%

Maximum apparent opening size	ASTM D4751	No. 30
Minimum permittivity	ASTM D4491	0.12 s ⁻¹

^[1] All numerical values represent minimum/maximum average roll values. Average test results from all rolls in a lot must conform to the tabulated values.

645.2.2.7 Geotextile, Type HR (Heavy Riprap)

Replace paragraph one with the following effective with the December 2017 letting:

- (1) Use fabric conforming to the following physical properties:

TEST	METHOD	VALUE ^[1]
Minimum grab tensile strength, lb	ASTM D4632	305 lb
Minimum puncture strength, lb	ASTM D6241	500 lb
Minimum apparent breaking elongation, %	ASTM D4632	15%
Maximum apparent opening size	ASTM D4751	No. 30
Minimum permittivity	ASTM D4491	0.40, s ⁻¹

^[1] All numerical values represent minimum/maximum average roll values. Average test results from all rolls in a lot must conform to the tabulated values.

645.2.2.8 Geotextile, Type C (Modified SAS)

Replace paragraph one with the following effective with the December 2017 letting:

- (1) Use fabric conforming to the following physical properties:

TEST	METHOD	VALUE ^[1]
Grab tensile strength, lb	ASTM D4632	205 lb
Puncture strength, lb	ASTM D6241	350 lb
Maximum apparent opening size	ASTM D4751	No. 50
Minimum permittivity	ASTM D4491	0.12 s ⁻¹

^[1] All numerical values represent minimum/maximum average roll values. Average test results from all rolls in a lot must conform to the tabulated values.

715.3.1.3 Department Verification Testing

Replace paragraph one with the following effective with the December 2017 letting:

- (1) The department will perform verification testing as specified in 701.4.2 with additional testing as required to obtain at least 1 verification test per lot for air content, slump, temperature, and compressive strength.

Errata

Make the following corrections to the standard specifications:

106.3.3.1 General

Correct errata by changing "acceptance" to "approval."

- (1) For manufactured products or assemblies, the department may base approval on a product certification or require both a product certification and production plant certification.
-

205.3.1 General

Correct errata by deleting paragraph three to reflect current practice to incorporate suitable materials.

- (3) Replace unsuitable material with satisfactory material. Trim and finish the roadway. Maintain the work done under 205 in a finished condition until acceptance.
-

521.2 Materials

Correct errata by deleting bullet three and including aluminum coated pipe in bullet one.

- (1) Furnish corrugated steel pipe and steel apron end walls as follows:
 - Corrugated steel culvert pipe, steel apron endwalls, aluminum coated corrugated steel culvert pipe, and other components conforming to AASHTO M36.
 - Polymer coated corrugated steel culvert pipe and pipe arch fabricated from zinc coated sheet steel conforming to AASHTO M218. Before fabrication, coat the sheets on both sides with polymer protective coating grade 250/250 according to AASHTO M246. Fabricate the pipe according to AASHTO M245.
-

614.3.2.2 Installing Rail

Correct errata for splice location and allow punching or drilling holes and slots.

- (1) Install rail with lap splices in the direction of traffic. Ensure that the number and dimensions of holes and bolts conforms to the plan details for new splices. Place the round head of bolts on the traffic side.
 - (2) Cut rails to length by shearing or sawing; do not use cutting torches. Drill or punch bolt holes and slots; ensure that they are burr free. After installation, cut anchor bolts that project more than one inch from the nut to 1/2 inch from the nut; deburr the threaded end of cut bolts.
-

618.1 Description

Correct errata by deleting designated detours from the scope of Maintenance and Repair of Haul Roads.

- (1) This section describes maintaining, repairing, and restoring all public roads, streets, drainage facilities, and other components used for hauling by contractor, subcontractor, or supplier to support work for a department contract to its pre-haul condition. Public roads and streets shall be limited to those not a part of the State Trunk Highway System and from now on called haul roads.

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.

NOTE: CRCS Prime Contractor payment is currently not automated and will need to be manually loaded into the Civil Rights Compliance System. Copies of prime contractor payments received (check or ACH) will have to be forwarded to paul.ndon@dot.wi.gov within 5 days of payment receipt to be logged manually.

***Additionally, for information on Subcontractor Sublet assignments, Subcontractor Payments and Payment Tracking, please refer to the CRCS Payment and Sublets manual at:

<http://wisconsindot.gov/Documents/doing-bus/civil-rights/labornwage/crcs-payments-sublets-manual.pdf>

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 Paul Ndon at (414) 438-4584 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 contact Paul Ndon at paul.ndon@dot.wi.gov. Not every contractor's payroll system is capable of producing export files. For details, see Section 4.8 CPR Auto Submit (Data Mapping) on pages 49-50; 66-71 of the CRCS Payroll Manual at:

<http://wisconsindot.gov/Documents/doing-bus/civil-rights/labornwage/crcs-payroll-manual.pdf>

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

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

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

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

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

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

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

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

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

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

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

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

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

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

Non-discrimination Provisions

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. Compliance with Regulations: The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. Non-discrimination: The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. Information and Reports: The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance: In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

- a. Withholding payments to the contractor under the contract until the contractor complies; and/or
- b. Cancelling, terminating, or suspending a contract, in whole or in part.

6. Incorporation of Provisions: The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures Non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

SEPTEMBER 2002

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE
EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidder's attention is called to the "Employment Practices" and "Equal Opportunity Clause" set forth in the Required Contract Provisions, FHWA 1273.
2. The goals and timetables for minority and female participation expressed in percentage terms for the contractor's aggregate work force in each trade, on all construction work in the covered area, are as follows:

Goals for Minority Participation for Each Trade:

<u>County</u>	<u>%</u>	<u>County</u>	<u>%</u>	<u>County</u>	<u>%</u>
Adams	1.7	Iowa	1.7	Polk	2.2
Ashland	1.2	Iron	1.2	Portage	0.6
Barron	0.6	Jackson	0.6	Price	0.6
Bayfield	1.2	Jefferson	7.0	Racine	8.4
Brown	1.3	Juneau	0.6	Richland	1.7
Buffalo	0.6	Kenosha	3.0	Rock	3.1
Burnett	2.2	Kewaunee	1.0	Rusk	0.6
Calumet	0.9	La Crosse	0.9	St. Croix	2.9
Chippewa	0.5	Lafayette	0.5	Sauk	1.7
Clark	0.6	Langlade	0.6	Sawyer	0.6
Columbia	1.7	Lincoln	0.6	Shawano	1.0
Crawford	0.5	Manitowoc	1.0	Sheboygan	7.0
Dane	2.2	Marathon	0.6	Taylor	0.6
Dodge	7.0	Marinette	1.0	Trempealeau	0.6
Door	1.0	Marquette	1.7	Vernon	0.6
Douglas	1.0	Menominee	1.0	Vilas	0.6
Dunn	0.6	Milwaukee	8.0	Walworth	7.0
Eau Claire	0.5	Monroe	0.6	Washburn	0.6
Florence	1.0	Oconto	1.0	Washington	8.0
Fond du Lac	1.0	Oneida	0.6	Waukesha	8.0
Forest	1.0	Outagamie	0.9	Waupaca	1.0
Grant	0.5	Ozaukee	8.0	Waushara	1.0
Green	1.7	Pepin	0.6	Winnebago	0.9
Green Lake	1.0	Pierce	2.2	Wood	0.6

Goals for female participation for each trade: 6.9%

These goals are applicable to all the contractor's construction work, (whether or not it is federal or federally assisted), performed in the covered area. If the contractor performs construction work in the geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The contractor's compliance with the Executive Order and the Regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the contractor's goals shall be a violation of the contract, the Executive Order and the Regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of \$10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor, employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

As referred to in this section, the Director means:

Director
Office of Federal Contract Compliance Programs
Ruess Federal Plaza
310 W. Wisconsin Ave., Suite 1115
Milwaukee, WI 53202

The "Employer Identification Number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

4. As used in this notice, and in the contract resulting from solicitation, the "covered area" is the county(ies) in Wisconsin to which this proposal applies.

APRIL 2013

ADDITIONAL FEDERAL-AID PROVISIONS

NOTICE TO ALL BIDDERS

To report bid rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., Eastern Time. Anyone with knowledge of possible bid rigging, bidding collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

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/hcciDocs/contracting-info/ws4567.doc>

Cargo Preference Act Requirement

All Federal-aid projects shall comply with 46 CFR 381.7 (a) – (b) as follows:

(a) *Agreement Clauses*. “Use of United States-flag vessels:”

(1) Pursuant to Pub. L. 664 (43 U.S.C. 1241(b)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.

(2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.”

(b) *Contractor and Subcontractor Clauses*. “Use of United States-flag vessels: The contractor agrees—”

(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

Effective with February 2017 Letting

**WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF
TRANSPORTATION AND SYSTEM DEVELOPMENT**

SUPPLEMENTAL REQUIRED CONTRACT PROVISIONS

- I.** Prevailing Wage Rates, Hours of Labor, and Payment of Wages
- II.** Payroll Requirements
- III.** Postings at the Site of the Work
- IV.** Wage Rate Distribution
- V.** Additional Classifications

**I. PREVAILING WAGE RATES, HOURS OF LABOR AND PAYMENT OF
WAGES**

The U.S. Department of Labor (Davis-Bacon Minimum Wage Rates) attached hereto and made a part hereof furnishes the prevailing wage rates pursuant to Section 84.062 of the Wisconsin Statutes. These wage rates are the minimum required to be paid to the 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 84.062, Stats. Apprentices shall be paid at rates not less than those prescribed in their apprenticeship contract.

While the wage rates shown are the minimum rates required by the contract to be paid during its life, this is 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 16.856 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 base rate of pay. All work on Saturday, Sunday and the following holidays is to be paid at time and a half:

January 1

Last Monday in May

July 4

First Monday in September

Fourth Thursday in November

December 25

The day before if January 1, July 4 or December 25 falls on a Saturday, and

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, euclid 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.

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 84.062 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 and accessible place at the site of work:

- a. "NOTICE TO EMPLOYEES," which provides information required to be posted by the provisions of Section 84.062 of the Wisconsin Statutes.
- b. A copy of the U.S. Department of Labor (Davis-Bacon, Minimum Wage Rates).
- c. A copy of the contractor's Equal Employment Opportunity Policy.

All required documents shall be posted by the first day of work and be accurate and complete. Postings must be readable, in an area where they will be noticed, and maintained until the last day of work.

IV. WAGE RATE REDISTRIBUTION

A contractor or subcontractor performing work subject to a Davis-Bacon wage determination may discharge its minimum wage obligations for the payment of both straight time wages and fringe benefits by (1) paying both in cash, (2) making payments or incurring costs for bona fide fringe benefits, or (3) by a combination thereof. Thus, under the Davis-Bacon a contractor may offset an amount of monetary wages paid in excess of the minimum wage required under the determination to satisfy its fringe benefit obligations. *See* 40 USC 3142(d) and 29 CFR 5.31.

V. ADDITIONAL CLASSIFICATIONS

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5(a)(1)(ii)). The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination.

The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- a. The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- b. The classification is utilized in the area by the construction industry; and
- c. The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

General Decision Number: WI170010 10/06/2017 WI10

Superseded General Decision Number: WI20160010

State: Wisconsin

Construction Type: Highway

Counties: Wisconsin Statewide.

HIGHWAY, AIRPORT RUNWAY & TAXIWAY CONSTRUCTION PROJECTS (does not include bridges over navigable waters; tunnels; buildings in highway rest areas; and railroad construction)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017
1	02/03/2017
2	02/10/2017
3	02/24/2017
4	03/17/2017
5	03/31/2017
6	04/21/2017
7	04/28/2017
8	06/02/2017
9	06/23/2017
10	07/14/2017
11	07/21/2017
12	07/28/2017
13	08/11/2017
14	08/25/2017
15	09/08/2017
16	09/22/2017
17	10/06/2017

BRWI0001-002 06/01/2016

CRAWFORD, JACKSON, JUNEAU, LA CROSSE, MONROE, TREMPLEAU, AND VERNON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 31.84	20.95

BRWI0002-002 06/01/2016

ASHLAND, BAYFIELD, DOUGLAS, AND IRON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 37.04	19.70

BRWI0002-005 06/01/2016

ADAMS, ASHLAND, BARRON, BROWN, BURNETT, CALUMET, CHIPPEWA, CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE, FOND DU LAC, FOREST, GREEN LAKE, IRON, JEFFERSON, KEWAUNEE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, OCONTO, ONEIDA, OUTAGAMIE, POLK, PORTAGE, RUSK, ST CROIX, SAUK, SHAWANO, SHEBOYGAN, TAYLOR, VILAS, WALWORTH, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 35.07	20.51

BRWI0003-002 06/01/2016		
BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, AND OCONTO COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 32.22	20.57

BRWI0004-002 06/01/2016		
KENOSHA, RACINE, AND WALWORTH COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 36.59	21.49

BRWI0006-002 06/01/2016		
ADAMS, CLARK, FOREST, LANGLADE, LINCOLN, MARATHON, MENOMINEE, ONEIDA, PORTAGE, PRICE, TAYLOR, VILAS AND WOOD COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 33.04	19.75

BRWI0007-002 06/01/2016		
GREEN, LAFAYETTE, AND ROCK COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 33.53	20.95

BRWI0008-002 06/01/2016		
MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 36.98	20.62

BRWI0011-002 06/01/2016		
CALUMET, FOND DU LAC, MANITOWOC, AND SHEBOYGAN COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 32.22	20.57

BRWI0019-002 06/01/2016		
BARRON, BUFFALO, BURNETT, CHIPPEWA, DUNN, EAU CLAIRE, PEPIN, PIERCE, POLK, RUSK, ST. CROIX, SAWYER AND WASHBURN COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 31.98	20.81

BRWI0034-002 06/01/2015		
COLUMBIA AND SAUK COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 32.86	17.22

CARP0087-001 05/01/2016		
BURNETT (W. of Hwy 48), PIERCE (W. of Hwy 29), POLK (W. of Hwys 35, 48 & 65), AND ST. CROIX (W. of Hwy 65) COUNTIES		
	Rates	Fringes
Carpenter & Piledrivermen.....	\$ 36.85	18.39

CARP0252-002 06/01/2016		

ADAMS, BARRON, BAYFIELD (Eastern 2/3), BROWN, BUFFALO, BURNETT (E. of Hwy 48), CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DANE, DODGE, DOOR, DUNN, EAU CLAIRE, FLORENCE (except area bordering Michigan State Line), FOND DU LAC, FOREST, GRANT, GREEN, GREEN LAKE, IOWA, IRON, JACKSON, JEFFERSON, JUNEAU, KEWAUNEE, LA CROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE (except N.E. corner), MARQUETTE, MENOMINEE, MONROE, OCONTO, ONEIDA, OUTAGAMIE, PEPIN, PIERCE (E. of Hwys 29 & 65), POLK (E. of Hwys 35, 48 & 65), PORTAGE, PRICE, RICHLAND, ROCK, RUSK, SAUK, SAWYER, SHAWANO, SHEBOYGAN, ST CROIX (E. of Hwy 65), TAYLOR, TREMPLEAU, VERNON, VILAS, WALWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
CARPENTER		
CARPENTER.....	\$ 33.56	18.00
MILLWRIGHT.....	\$ 35.08	18.35
PILEDRIIVER.....	\$ 34.12	18.00

CARP0252-010 06/01/2016

ASHLAND COUNTY

	Rates	Fringes
Carpenters		
Carpenter.....	\$ 33.56	18.00
Millwright.....	\$ 35.08	18.35
Pile Driver.....	\$ 34.12	18.00

CARP0264-003 06/01/2016

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WAUKESHA, AND WASHINGTON COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 35.78	22.11

CARP0361-004 05/01/2016

BAYFIELD (West of Hwy 63) AND DOUGLAS COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 34.57	18.16

CARP2337-001 06/01/2016

ZONE A: MILWAUKEE, OZAUKEE, WAUKESHA AND WASHINGTON

ZONE B: KENOSHA & RACINE

	Rates	Fringes
PILEDRIIVERMAN		
Zone A.....	\$ 31.03	22.69
Zone B.....	\$ 31.03	22.69

ELEC0014-002 06/01/2017

ASHLAND, BARRON, BAYFIELD, BUFFALO, BURNETT, CHIPPEWA, CLARK (except Maryville, Colby, Unity, Sherman, Fremont, Lynn & Sherwood), CRAWFORD, DUNN, EAU CLAIRE, GRANT, IRON, JACKSON, LA CROSSE, MONROE, PEPIN, PIERCE, POLK, PRICE, RICHLAND, RUSK, ST CROIX, SAWYER, TAYLOR, TREMPLEAU, VERNON, AND WASHBURN COUNTIES

	Rates	Fringes
Electricians:.....	\$ 33.01	19.69

ELEC0014-007 06/05/2017

REMAINING COUNTIES

	Rates	Fringes
Teledata System Installer		
Installer/Technician.....	\$ 25.81	14.01
Low voltage construction, installation, maintenance and removal of teledata facilities (voice, data, and video) including outside plant, telephone and data inside wire, interconnect, terminal equipment, central offices, PABX, fiber optic cable and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area networks), LAN (local area networks), and ISDN (integrated systems digital network).		

ELEC0127-002 06/01/2017

KENOSHA COUNTY

	Rates	Fringes
Electricians:.....	\$ 38.50	30%+10.57

ELEC0158-002 06/05/2017

BROWN, DOOR, KEWAUNEE, MANITOWOC (except Schleswig), MARINETTE (Wausaukee and area South thereof), OCONTO, MENOMINEE (East of a line 6 miles West of the West boundary of Oconto County), SHAWANO (Except Area North of Townships of Aniwa and Hutchins) COUNTIES

	Rates	Fringes
Electricians:.....	\$ 31.48	19.18

ELEC0159-003 06/05/2017

COLUMBIA, DANE, DODGE (Area West of Hwy 26, except Chester and Emmet Townships), GREEN, LAKE (except Townships of Berlin, Seneca, and St. Marie), IOWA, MARQUETTE (except Townships of Neshkoka, Crystal Lake, Newton, and Springfield), and SAUK COUNTIES

	Rates	Fringes
Electricians:.....	\$ 37.75	20.96

ELEC0219-004 06/01/2016

FLORENCE COUNTY (Townships of Aurora, Commonwealth, Fern, Florence and Homestead) AND MARINETTE COUNTY (Township of Niagara)

	Rates	Fringes
Electricians:		
Electrical contracts over \$180,000.....	\$ 32.38	18.63
Electrical contracts under \$180,000.....	\$ 30.18	18.42

ELEC0242-005 06/04/2017

DOUGLAS COUNTY

	Rates	Fringes
Electricians:.....	\$ 35.90	25.64

ELEC0388-002 05/30/2016

ADAMS, CLARK (Colby, Freemont, Lynn, Mayville, Sherman, Sherwood, Unity), FOREST, JUNEAU, LANGLADE, LINCOLN, MARATHON, MARINETTE (Beecher, Dunbar, Goodman & Pembine), MENOMINEE (Area West of a line 6 miles West of the West boundary of Oconto County), ONEIDA, PORTAGE, SHAWANO (Aniwa and Hutchins), VILAS AND WOOD COUNTIES

	Rates	Fringes
Electricians:.....	\$ 30.69	26.00% +10.05

ELEC0430-002 06/01/2017		

RACINE COUNTY (Except Burlington Township)

	Rates	Fringes
Electricians:.....	\$ 37.32	21.07

ELEC0494-005 06/01/2017		

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Electricians:.....	\$ 37.51	24.42

ELEC0494-006 06/01/2017		

CALUMET (Township of New Holstein), DODGE (East of Hwy 26 including Chester Township), FOND DU LAC, MANITOWOC (Schleswig), and SHEBOYGAN COUNTIES

	Rates	Fringes
Electricians:.....	\$ 32.06	21.88

ELEC0494-013 06/01/2015		

DODGE (East of Hwy 26 including Chester Twp, excluding Emmet Twp), FOND DU LAC (Except Waupuin), MILWAUKEE, OZAUKEE, MANITOWOC (Schleswig), WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Sound & Communications		
Installer.....	\$ 16.47	14.84
Technician.....	\$ 26.00	17.70

Installation, testing, maintenance, operation and servicing of all sound, intercom, telephone interconnect, closed circuit TV systems, radio systems, background music systems, language laboratories, electronic carillon, antenna distribution systems, clock and program systems and low-voltage systems such as visual nurse call, audio/visual nurse call systems, doctors entrance register systems. Includes all wire and cable carrying audio, visual, data, light and radio frequency signals. Includes the installation of conduit, wiremold, or raceways in existing structures that have been occupied for six months or more where required for the protection of the wire or cable, but does not mean a complete conduit or raceway system. work covered does not include the installation of conduit, wiremold or any raceways in any new construction, or the installation of power supply outlets by means of which external electric power is supplied to any of the foregoing equipment or products

ELEC0577-003 06/01/2017

CALUMET (except Township of New Holstein), GREEN LAKE (N. part including Townships of Berlin, St Marie, and Seneca), MARQUETTE (N. part including Townships of Crystal Lake, Neshkoro, Newton, and Springfield), OUTAGAMIE, WAUPACA, WAUSHARA, AND WINNEBAGO COUNTIES

	Rates	Fringes
Electricians:.....	\$ 31.15	18.22

ELEC0890-003 06/01/2017		

DODGE (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE,

RACINE (Burlington Township), ROCK AND WALWORTH COUNTIES

	Rates	Fringes
Electricians:.....	\$ 33.25	19.34

ELEC0953-001 07/01/2015		

	Rates	Fringes
Line Construction:		
(1) Lineman.....	\$ 42.14	32% + 5.00
(2) Heavy Equipment Operator.....	\$ 40.03	32% + 5.00
(3) Equipment Operator.....	\$ 33.71	32% + 5.00
(4) Heavy Groundman Driver..	\$ 26.78	14.11
(5) Light Groundman Driver..	\$ 24.86	13.45
(6) Groundsman.....	\$ 23.18	32% + 5.00

ENGI0139-005 06/05/2017		

	Rates	Fringes
Power Equipment Operator		
Group 1.....	\$ 39.27	22.05
Group 2.....	\$ 38.77	22.05
Group 3.....	\$ 38.27	22.05
Group 4.....	\$ 38.01	22.05
Group 5.....	\$ 37.72	22.05
Group 6.....	\$ 31.82	22.05

HAZARDOUS WASTE PREMIUMS:

EPA Level "A" protection - \$3.00 per hour
 EPA Level "B" protection - \$2.00 per hour
 EPA Level "C" protection - \$1.00 per hour

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, tower cranes, and derricks with or without attachments with a lifting capacity of over 100 tons; or cranes, tower cranes, and derricks with boom, leads and/or jib lengths measuring 176 feet or longer.

GROUP 2: Cranes, tower cranes and derricks with or without attachments with a lifting capacity of 100 tons or less; or cranes, tower cranes, and derricks with boom, leads, and/or jibs lengths measuring 175 feet or under and Backhoes (excavators) weighing 130,000 lbs and over; caisson rigs; pile driver; dredge operator; dredge engineer; Boat Pilot.

GROUP 3: Mechanic or welder - Heavy duty equipment; cranes with a lifting capacity of 25 tons or under; concrete breaker (manual or remote); vibratory/sonic concrete breaker; concrete laser screed; concrete slipform paver; concrete batch plant operator; concrete pvt. spreader - heavy duty (rubber tired); concrete spreader & distributor; automatic subgrader (concrete); concrete grinder & planing machine; concrete slipform curb & gutter machine; slipform concrete placer; tube finisher; hydro blaster (10,000 psi & over); bridge paver; concrete conveyor system; concrete pump; Rotec type Conveyor; stabilizing mixer (self-propelled); shoulder widener; asphalt plant engineer; bituminous paver; bump cutter & grooving machine; milling machine; screed (bituminous paver); asphalt heater, planer & scarifier; Backhoes (excavators) weighing under 130,000 lbs; grader or motor patrol; tractor (scraper, dozer, pusher, loader); scraper - rubber tired (single or twin engine); endloader; hydraulic backhoe (tractor type); trenching machine; skid rigs; tractor, side boom (heavy); drilling or boring machine (mechanical heavy); roller over 5 tons; percussion or rotary drilling machine; air track; blaster; loading machine (conveyor); tugger; boatmen; winches & A-frames; post driver; material hoist.

GROUP 4: Greaser, roller steel (5 tons or less); roller (pneumatic tired) - self propelled; tractor (mounted or towed compactors & light equipment); shouldering machine; self-propelled chip spreader; concrete spreader; finishing machine; mechanical float; curing machine; power subgrader; joint sawer (multiple blade) belting machine; burlap

machine; texturing machine; tractor endloader (rubber tired) - light; jeep digger; forklift; mulcher; launch operator; fireman, environmental burner

GROUP 5: Air compressor; power pack; vibrator hammer and extractor; heavy equipment, leadman; tank car heaters; stump chipper; curb machine operator; Concrete proportioning plants; generators; mudjack operator; rock breaker; crusher or screening plant; screed (milling machine); automatic belt conveyor and surge bin; pug mill operator; Oiler, pump (over 3 inches); Drilling Machine Tender.

GROUP 6: Off-road material hauler with or without ejector.

IRON0008-002 06/01/2017

BROWN, CALUMET, DOOR, FOND DU LAC, KEWAUNEE, MANITOWOC, MARINETTE, OCONTO, OUTAGAMI, SHAWANO, SHEBOYGAN, AND WINNEBAGO COUNTIES:

	Rates	Fringes
IRONWORKER.....	\$ 31.24	26.97
Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.		

IRON0008-003 06/01/2017

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH (N.E. 2/3), WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 33.19	26.97
Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.		

IRON0383-001 06/01/2017

ADAMS, COLUMBIA, CRAWFORD, DANE, DODGE, FLORENCE, FOREST, GRANT, GREENE, (Excluding S.E. tip), GREEN LAKE, IOWA, JEFFERSON, JUNEAU, LA CROSSE, LAFAYETTE, LANGLADE, MARATHON, MARQUETTE, MENOMINEE, MONROE, PORTAGE, RICHLAND, ROCK (Northern area, vicinity of Edgerton and Milton), SAUK, VERNON, WAUPACA, WAUSHARA, AND WOOD COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 34.50	23.82

IRON0498-005 06/01/2016

GREEN (S.E. 1/3), ROCK (South of Edgerton and Milton), and WALWORTH (S.W. 1/3) COUNTIES:

	Rates	Fringes
IRONWORKER.....	\$ 36.29	30.77

IRON0512-008 05/01/2017

BARRON, BUFFALO, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, JACKSON, PEPIN, PIERCE, POLK, RUSK, ST CROIX, TAYLOR, AND TREMPLEAU COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 36.50	26.45

IRON0512-021 05/01/2017

ASHLAND, BAYFIELD, BURNETT, DOUGLAS, IRON, LINCOLN, ONEIDA,
PRICE, SAWYER, VILAS AND WASHBURN COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 32.04	26.45

LABO0113-002 06/05/2017		

MILWAUKEE AND WAUKESHA COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 26.80	21.34
Group 2.....	\$ 26.95	21.34
Group 3.....	\$ 27.15	21.34
Group 4.....	\$ 27.30	21.34
Group 5.....	\$ 27.45	21.34
Group 6.....	\$ 23.29	21.34

LABORERS CLASSIFICATIONS

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer;
Demolition and Wrecking Laborer; Guard Rail, Fence, and
Bridge Builder; Landscaper; Multiplate Culvert Assembler;
Stone Handler; Bituminous Worker (Shoveler, Loader, and
Utility Man); Batch Truck Dumper or Cement Handler;
Bituminous Worker (Dumper, Ironer, Smoother, and Tamper);
Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler
(Pavement); Vibrator or Tamper Operator (Mechanical Hand
Operated); Chain Saw Operator; Demolition Burning Torch
Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter
(Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster and Powderman

GROUP 6: Flagperson; traffic control person

LABO0113-003 06/05/2017

OZAUKEE AND WASHINGTON COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 26.05	21.34
Group 2.....	\$ 26.15	21.34
Group 3.....	\$ 26.20	21.34
Group 4.....	\$ 26.40	21.34
Group 5.....	\$ 26.25	21.34
Group 6.....	\$ 23.14	21.34

LABORERS CLASSIFICATIONS

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer;
Demolition and Wrecking Laborer; Guard Rail, Fence, and
Bridge Builder; Landscaper; Multiplate Culvert Assembler;
Stone Handler; Bituminous Worker (Shoveler, Loader, and
Utility Man); Batch Truck Dumper or Cement Handler;
Bituminous Worker (Dumper, Ironer, Smoother, and Tamper);
Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler
(Pavement); Vibrator or Tamper Operator (Mechanical Hand
Operated);

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter
(Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster; powderman

GROUP 6: Flagperson and Traffic Control Person

LABO0113-011 06/05/2017

KENOSHA AND RACINE COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 25.86	21.34
Group 2.....	\$ 26.01	21.34
Group 3.....	\$ 26.21	21.34
Group 4.....	\$ 26.18	21.34
Group 5.....	\$ 26.51	21.34
Group 6.....	\$ 23.00	21.34

LABORERS CLASSIFICATIONS:

GROUP 1: General laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence, and Bridge Builder; Landscaper; Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, and Utility Man); Batch Truck Dumper or Cement Handler; Bituminous worker (Dumper, Ironer, Smoother, and Tamper); Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster and Powderman

GROUP 6: Flagman; traffic control person

* LABO0140-002 06/05/2017

ADAMS, ASHLAND, BARRON, BAYFIELD, BROWN, BUFFALO, BURNETT, CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DODGE, DOOR, DOUGLAS, DUNN, EAU CLAIRE, FLORENCE, FOND DU LAC, FOREST, GRANT, GREEN, GREEN LAKE, IRON, JACKSON, JUNEAU, IOWA, JEFFERSON, KEWAUNEE, LA CROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, MONROE, OCONTO, ONEIDA, OUTAGAMIE, PEPIN, PIERCE, POLK, PORTAGE, PRICE, RICHLAND, ROCK, RUSK, SAUK, SAWYER, SHAWANO, SHEBOYGAN, ST. CROIX, TAYLOR, TREMPLEAU, VERNON, VILLAS, WALWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 30.71	16.79
Group 2.....	\$ 30.81	16.79
Group 3.....	\$ 30.86	16.79
Group 4.....	\$ 31.06	16.79
Group 5.....	\$ 30.91	16.79
Group 6.....	\$ 27.34	16.79

LABORER CLASSIFICATIONS

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence, and Bridge Builder; Landscaper; Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, and Utility Man); Batch Truck Dumper or Cement Handler; Bituminous Worker (Dumper, Ironer, Smoother and Tamper); Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator, Demolition Burning Torch

Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter
(Curb, Sidewalk and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster; powderman

GROUP 6: Flagperson; Traffic Control

* LABO0464-003 06/05/2017

DANE COUNTY

	Rates	Fringes
LABORER		
Group 1.....	\$ 30.99	16.79
Group 2.....	\$ 31.09	16.79
Group 3.....	\$ 31.14	16.79
Group 4.....	\$ 31.34	16.79
Group 5.....	\$ 31.19	16.79
Group 6.....	\$ 27.34	16.79

LABORERS CLASSIFICATIONS:

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer;
Demolition and Wrecking Laborer; Guard Rail, Fence, and
Bridge Builder; Landscaper; Multiplate Culvert Assembler;
Stone Handler; Bituminous Worker (Shoveler, Loader, and
Utility Man); Batch Truck Dumper or Cement Handler;
Bituminous Worker (Dumper, Ironer, Smoother, and Tamper);
Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler
(Pavement); Vibrator or Tamper Operator (Mechanical Hand
Operated); Chain Saw Operator; Demolition Burning Torch
Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter
(Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster; Powderman

GROUP 6: Flagperson and Traffic Control Person

PAIN0106-008 05/02/2016

ASHLAND, BAYFIELD, BURNETT, AND DOUGLAS COUNTIES

	Rates	Fringes
Painters:		
New:		
Brush, Roller.....	\$ 29.86	16.35
Spray, Sandblast, Steel....	\$ 30.46	16.35
Repaint:		
Brush, Roller.....	\$ 28.36	16.35
Spray, Sandblast, Steel....	\$ 28.96	16.35

* PAIN0108-002 06/01/2017

RACINE COUNTY

	Rates	Fringes
Painters:		
Brush, Roller.....	\$ 33.74	18.95
Spray & Sandblast.....	\$ 34.74	18.95

PAIN0259-002 05/01/2008

BARRON, CHIPPEWA, DUNN, EAU CLAIRE, PEPIN, PIERCE, POLK, RUSK,
SAWYER, ST. CROIX, AND WASHBURN COUNTIES

	Rates	Fringes
PAINTER.....	\$ 24.11	12.15

PAIN0259-004 05/01/2015

BUFFALO, CRAWFORD, JACKSON, LA CROSSE, MONROE, TREMPLEALEAU, AND
VERNON COUNTIES

	Rates	Fringes
PAINTER.....	\$ 22.03	12.45

PAIN0781-002 06/01/2017

JEFFERSON, MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Painters:		
Bridge.....	\$ 30.60	22.80
Brush.....	\$ 30.25	22.80
Spray & Sandblast.....	\$ 31.00	22.80

PAIN0802-002 06/01/2017

COLUMBIA, DANE, DODGE, GRANT, GREEN, IOWA, LAFAYETTE, RICHLAND,
ROCK, AND SAUK COUNTIES

	Rates	Fringes
PAINTER		
Brush.....	\$ 28.25	17.72

PREMIUM PAY:
 Structural Steel, Spray, Bridges = \$1.00 additional per
 hour.

PAIN0802-003 06/01/2017

ADAMS, BROWN, CALUMET, CLARK, DOOR, FOND DU LAC, FOREST, GREEN
LAKE, IRON, JUNEAU, KEWAUNEE, LANGLADE, LINCOLN, MANITOWOC,
MARATHON, MARINETTE, MARQUETTE, MENOMINEE, OCONTO, ONEIDA,
OUTAGAMIE, PORTAGE, PRICE, SHAWANO, SHEBOYGAN, TAYLOR, VILAS,
WAUSHARA, WAUPACA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
PAINTER.....	\$ 24.89	12.05

PAIN0934-001 06/01/2017

KENOSHA AND WALWORTH COUNTIES

	Rates	Fringes
Painters:		
Brush.....	\$ 33.74	18.95
Spray.....	\$ 34.74	18.95
Structural Steel.....	\$ 33.89	18.95

PAIN1011-002 06/01/2017

FLORENCE COUNTY

	Rates	Fringes
Painters:.....	\$ 24.86	12.23

PLAS0599-010 06/01/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER		
Area 1.....	\$ 39.46	17.17
Area 2 (BAC).....	\$ 35.07	19.75
Area 3.....	\$ 35.61	19.40

Area 4.....	\$ 34.70	20.51
Area 5.....	\$ 36.27	18.73
Area 6.....	\$ 32.02	22.99

AREA DESCRIPTIONS

AREA 1: BAYFIELD, DOUGLAS, PRICE, SAWYER, AND WASHBURN COUNTIES

AREA 2: ADAMS, ASHLAND, BARRON, BROWN, BURNETT, CALUMET, CHIPPEWA, CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE, FOND DU LAC, FOREST, GREEN LAKE, IRON, JEFFERSON, KEWAUNEE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, OCONTO, ONEIDA, OUTAGAMIE, POLK, PORTAGE, RUSK, ST CROIX, SAUK, SHAWANO, SHEBOYGAN, TAYLOR, VILAS, WALWORTH, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

AREA 3: BUFFALO, CRAWFORD, EAU CLAIRE, JACKSON, JUNEAU, LA CROSSE, MONROE, PEPIN, PIERCE, RICHLAND, TREMPEREAU, AND VERNON COUNTIES

AREA 4: MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

AREA 5: DANE, GRANT, GREEN, IOWA, LAFAYETTE, AND ROCK COUNTIES

AREA 6: KENOSHA AND RACINE COUNTIES

TEAM0039-001 06/01/2017

	Rates	Fringes
TRUCK DRIVER		
1 & 2 Axles.....	\$ 27.40	20.48
3 or more Axles; Euclids Dumptor & Articulated, Truck Mechanic.....	\$ 27.55	20.48

WELL DRILLER.....	\$ 16.52	3.70

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular

rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial

contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

General Decision Number: WI170015 10/06/2017 WI15

Superseded General Decision Number: WI20160015

State: Wisconsin

Construction Type: Heavy

Counties: Wisconsin Statewide.

HEAVY CONSTRUCTION PROJECTS (Excluding Tunnel, Sewer, and Water Lines).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017
1	02/03/2017
2	02/10/2017
3	02/24/2017
4	03/17/2017
5	03/31/2017
6	04/14/2017
7	04/28/2017
8	06/02/2017
9	06/23/2017
10	07/14/2017
11	07/21/2017
12	07/28/2017
13	08/11/2017
14	08/25/2017
15	09/08/2017
16	09/22/2017
17	10/06/2017

BOIL0107-001 01/01/2017

	Rates	Fringes
BOILERMAKER		
Boilermaker.....	\$ 35.65	29.89
Small Boiler Repair (under 25,000 lbs/hr).....	\$ 26.91	16.00

BRWI0001-002 06/01/2016

CRAWFORD, JACKSON, JUNEAU, LA CROSSE, MONROE, TREMPLEAU, AND
VERNON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 31.84	20.95

BRWI0002-002 06/01/2016

ASHLAND, BAYFIELD, DOUGLAS, AND IRON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 37.04	19.70

BRWI0002-005 06/01/2016

ADAMS, ASHLAND, BARRON, BROWN, BURNETT, CALUMET, CHIPPEWA,
CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE, FOND DU LAC,
FOREST, GREEN LAKE, IRON, JEFFERSON, KEWAUNEE, LANGLADE,
LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE,

OCONTO, ONEIDA, OUTAGAMIE, POLK, PORTAGE, RUSK, ST CROIX, SAUK,
 SHAWANO, SHEBOYGAN, TAYLOR, VILAS, WALWORTH, WAUPACA, WAUSHARA,
 WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 35.07	20.51

BRWI0003-002 06/01/2016		

BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, AND OCONTO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 32.22	20.57

BRWI0004-002 06/01/2016		

KENOSHA, RACINE, AND WALWORTH COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 36.59	21.49

BRWI0006-002 06/01/2016		

ADAMS, CLARK, FOREST, LANGLADE, LINCOLN, MARATHON, MENOMINEE,
 ONEIDA, PORTAGE, PRICE, TAYLOR, VILAS AND WOOD COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 33.04	19.75

BRWI0007-002 06/01/2016		

GREEN, LAFAYETTE, AND ROCK COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 33.53	20.95

BRWI0008-002 06/01/2016		

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 36.98	20.62

BRWI0009-001 06/01/2016		

GREEN LAKE, MARQUETTE, OUTAGAMIE, SHAWANO, WAUPACA, WASHARA,
 AND WINNEBAGO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 32.22	20.57

BRWI0011-002 06/01/2016		

CALUMET, FOND DU LAC, MANITOWOC, AND SHEBOYGAN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 32.22	20.57

BRWI0013-002 06/01/2016		

DANE, GRANT, IOWA, AND RICHLAND COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 33.49	20.99

BRWI0019-002 06/01/2016		

BARRON, BUFFALO, BURNETT, CHIPPEWA, DUNN, EAU CLAIRE, PEPIN,
 PIERCE, POLK, RUSK, ST. CROIX, SAWYER AND WASHBURN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 31.98	20.81

BRWI0021-002 06/01/2015		
DODGE AND JEFFERSON COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 33.58	16.65

BRWI0034-002 06/01/2015		
COLUMBIA AND SAUK COUNTIES		
	Rates	Fringes
BRICKLAYER.....	\$ 32.86	17.22

CARP0087-001 05/01/2016		
BURNETT (W. of Hwy 48), PIERCE (W. of Hwy 29), POLK (W. of Hwys 35, 48 & 65), AND ST. CROIX (W. of Hwy 65) COUNTIES		
	Rates	Fringes
Carpenter & Piledrivermen.....	\$ 36.85	18.39

CARP0252-002 06/01/2016		
ADAMS, BARRON, BAYFIELD (Eastern 2/3), BROWN, BUFFALO, BURNETT (E. of Hwy 48), CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DANE, DODGE, DOOR, DUNN, EAU CLAIRE, FLORENCE (except area bordering Michigan State Line), FOND DU LAC, FOREST, GRANT, GREEN, GREEN LAKE, IOWA, IRON, JACKSON, JEFFERSON, JUNEAU, KEWAUNEE, LA CROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE (except N.E. corner), MARQUETTE, MENOMINEE, MONROE, OCONTO, ONEIDA, OUTAGAMIE, PEPIN, PIERCE (E. of Hwys 29 & 65), POLK (E. of Hwys 35, 48 & 65), PORTAGE, PRICE, RICHLAND, ROCK, RUSK, SAUK, SAWYER, SHAWANO, SHEBOYGAN, ST CROIX (E. of Hwy 65), TAYLOR, TREMPLEAU, VERNON, VILAS, WALWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES		
	Rates	Fringes
CARPENTER		
CARPENTER.....	\$ 33.56	18.00
MILLWRIGHT.....	\$ 35.08	18.35
PILEDRIIVER.....	\$ 34.12	18.00

CARP0252-010 06/01/2016		
ASHLAND COUNTY		
	Rates	Fringes
Carpenters		
Carpenter.....	\$ 33.56	18.00
Millwright.....	\$ 35.08	18.35
Pile Driver.....	\$ 34.12	18.00

CARP0264-003 06/01/2016		
KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WAUKESHA, AND WASHINGTON COUNTIES		
	Rates	Fringes
CARPENTER.....	\$ 35.78	22.11

CARP0361-004 05/01/2016		
BAYFIELD (West of Hwy 63) AND DOUGLAS COUNTIES		

	Rates	Fringes
CARPENTER.....	\$ 34.57	18.16

CARP2337-001 06/01/2016

ZONE A: MILWAUKEE, OZAUKEE, WAUKESHA AND WASHINGTON

ZONE B: KENOSHA & RACINE

	Rates	Fringes
PILEDRIVERMAN		
Zone A.....	\$ 31.03	22.69
Zone B.....	\$ 31.03	22.69

CARP2337-003 06/01/2016

	Rates	Fringes
MILLWRIGHT		
Zone A.....	\$ 29.98	21.53
Zone B.....	\$ 29.98	21.53

ZONE DEFINITIONS

ZONE A: MILWAUKEE, OZAUKEE, WAUKESHA AND WASHINGTON COUNTIES

ZONE B: KENOSHA & RACINE COUNTIES

ELEC0014-002 06/01/2017

ASHLAND, BARRON, BAYFIELD, BUFFALO, BURNETT, CHIPPEWA, CLARK (except Maryville, Colby, Unity, Sherman, Fremont, Lynn & Sherwood), CRAWFORD, DUNN, EAU CLAIRE, GRANT, IRON, JACKSON, LA CROSSE, MONROE, PEPIN, PIERCE, POLK, PRICE, RICHLAND, RUSK, ST CROIX, SAWYER, TAYLOR, TREMPLEAU, VERNON, AND WASHBURN COUNTIES

	Rates	Fringes
Electricians:.....	\$ 33.01	19.69

ELEC0014-007 06/05/2017

REMAINING COUNTIES

	Rates	Fringes
Teledata System Installer		
Installer/Technician.....	\$ 25.81	14.01

Low voltage construction, installation, maintenance and removal of teledata facilities (voice, data, and video) including outside plant, telephone and data inside wire, interconnect, terminal equipment, central offices, PABX, fiber optic cable and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area networks), LAN (local area networks), and ISDN (integrated systems digital network).

ELEC0127-002 06/01/2017

KENOSHA COUNTY

	Rates	Fringes
Electricians:.....	\$ 38.50	30%+10.57

ELEC0158-002 06/05/2017

BROWN, DOOR, KEWAUNEE, MANITOWOC (except Schleswig), MARINETTE(Wausuakee and area South thereof), OCONTO, MENOMINEE (East of a ine 6 miles West of the West boundary of Oconto County), SHAWANO (Except Area North of Townships of Aniwa and Hutchins) COUNTIES

	Rates	Fringes
Electricians:.....	\$ 31.48	19.18

ELEC0159-003 06/05/2017		
COLUMBIA, DANE, DODGE (Area West of Hwy 26, except Chester and Emmet Townships), GREEN, LAKE (except Townships of Berlin, Seneca, and St. Marie), IOWA, MARQUETTE (except Townships of Neshkoka, Crystal Lake, Newton, and Springfield), and SAUK COUNTIES		
	Rates	Fringes
Electricians:.....	\$ 37.75	20.96

ELEC0219-004 06/01/2016		
FLORENCE COUNTY (Townships of Aurora, Commonwealth, Fern, Florence and Homestead) AND MARINETTE COUNTY (Township of Niagara)		
	Rates	Fringes
Electricians:		
Electrical contracts over \$180,000.....	\$ 32.38	18.63
Electrical contracts under \$180,000.....	\$ 30.18	18.42

ELEC0242-005 06/04/2017		
DOUGLAS COUNTY		
	Rates	Fringes
Electricians:.....	\$ 35.90	25.64

ELEC0388-002 05/30/2016		
ADAMS, CLARK (Colby, Freemont, Lynn, Mayville, Sherman, Sherwood, Unity), FOREST, JUNEAU, LANGLADE, LINCOLN, MARATHON, MARINETTE (Beecher, Dunbar, Goodman & Pembine), MENOMINEE (Area West of a line 6 miles West of the West boundary of Oconto County), ONEIDA, PORTAGE, SHAWANO (Aniwa and Hutchins), VILAS AND WOOD COUNTIES		
	Rates	Fringes
Electricians:.....	\$ 30.69	26.00% +10.05

ELEC0430-002 06/01/2017		
RACINE COUNTY (Except Burlington Township)		
	Rates	Fringes
Electricians:.....	\$ 37.32	21.07

ELEC0494-005 06/01/2017		
MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES		
	Rates	Fringes
Electricians:.....	\$ 37.51	24.42

ELEC0494-006 06/01/2017		
CALUMET (Township of New Holstein), DODGE (East of Hwy 26 including Chester Township), FOND DU LAC, MANITOWOC (Schleswig), and SHEBOYGAN COUNTIES		
	Rates	Fringes
Electricians:.....	\$ 32.06	21.88

ELEC0494-013 06/01/2015

DODGE (East of Hwy 26 including Chester Twp, excluding Emmet Twp), FOND DU LAC (Except Waupun), MILWAUKEE, OZAUKKEE, MANITOWOC (Schleswig), WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Sound & Communications		
Installer.....	\$ 16.47	14.84
Technician.....	\$ 26.00	17.70

Installation, testing, maintenance, operation and servicing of all sound, intercom, telephone interconnect, closed circuit TV systems, radio systems, background music systems, language laboratories, electronic carillon, antenna distribution systems, clock and program systems and low-voltage systems such as visual nurse call, audio/visual nurse call systems, doctors entrance register systems. Includes all wire and cable carrying audio, visual, data, light and radio frequency signals. Includes the installation of conduit, wiremold, or raceways in existing structures that have been occupied for six months or more where required for the protection of the wire or cable, but does not mean a complete conduit or raceway system. work covered does not include the installation of conduit, wiremold or any raceways in any new construction, or the installation of power supply outlets by means of which external electric power is supplied to any of the foregoing equipment or products

ELEC0577-003 06/01/2017

CALUMET (except Township of New Holstein), GREEN LAKE (N. part including Townships of Berlin, St Marie, and Seneca), MARQUETTE (N. part including Townships of Crystal Lake, Neshkoro, Newton, and Springfield), OUTAGAMIE, WAUPACA, WAUSHARA, AND WINNEBAGO COUNTIES

	Rates	Fringes
Electricians:.....	\$ 31.15	18.22

ELEC0890-003 06/01/2017

DODGE (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE, RACINE (Burlington Township), ROCK AND WALWORTH COUNTIES

	Rates	Fringes
Electricians:.....	\$ 33.25	19.34

ELEC0953-001 07/01/2015

	Rates	Fringes
Line Construction:		
(1) Lineman.....	\$ 42.14	32% + 5.00
(2) Heavy Equipment Operator.....	\$ 40.03	32% + 5.00
(3) Equipment Operator.....	\$ 33.71	32% + 5.00
(4) Heavy Groundman Driver..	\$ 26.78	14.11
(5) Light Groundman Driver..	\$ 24.86	13.45
(6) Groundsman.....	\$ 23.18	32% + 5.00

ENGI0139-001 06/01/2017

KENOSHA, MILWAUKEE, OZAUKKEE, RACINE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Power Equipment Operator		
Group 1.....	\$ 44.11	21.15
Group 2.....	\$ 43.61	21.15
Group 3.....	\$ 43.11	21.15

Group 4.....	\$ 42.42	21.15
Group 5.....	\$ 39.94	21.15
Group 6.....	\$ 34.79	21.15

HAZARDOUS WASTE PREMIUMS:

EPA Level "A" Protection: \$3.00 per hour
 EPA Level "B" Protection: \$2.00 per hour
 EPA Level "C" Protection: \$1.00 per hour

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, Tower Cranes, Pedestal Tower Cranes and Derricks with or w/o attachments with a lifting capacity of over 100 tons; or Cranes, Tower Cranes, Pedestal Tower Cranes and Derricks with boom, leads, and/or jib lengths measuring 176 feet or longer; Self-Erecting Tower Cranes over 4000 lbs lifting capacity; All Cranes with Boom Dollies; Boring Machines (directional); Master Mechanic. \$0.50 additional per hour per 100 tons or 100 ft of boom over 200 ft or lifting capacity of crane over 200 tons to a maximum of 300 tons or 300 ft. Thereafter an increase of \$0.01 per ft or ton, whichever is greater.

GROUP 2: Cranes, Tower Cranes, Pedestal Tower Cranes and Derricks with or without attachments with a lifting capacity of 100 tons or less; or Cranes, Tower Cranes Portable Tower Cranes, Pedestal Tower Cranes and Derricks with boom, leadsand/or jib lengths measuring 175 feet or less; Backhoes (excavators) 130,000 lbs and over; Caisson Rigs; Pile Drivers; Boring Machines (vertical or horizontal), Versi-Lift, Tri-Lift, Gantry 20,000 lbs & over.

GROUP 3: Backhoe (excavator) under 130,000 lbs;Self-erecting Tower Crane 4000 lbs & under lifting capacity;Traveling Crane (bridge type); Skid Rigs; Dredge Operator; Mechanic; Concrete Paver (over 27E); Concrete Spreader and Distributor; Forklift/ Telehandler (machinery- moving / steel erection); Hydro Blaster, 10,000 psi and over

GROUP 4: Material Hoists; Stack Hoists; Hydraulic Backhoe (tractor or truck mounted); Hydraulic Crane, 5 tons or under (tractor or truck mounted); Hoist (tuggers 5 tons & over); Hydro-Excavators/Daylighters; Concrete Pumps Rotec type Conveyors; Tractor/Bulldozer/End Loader (over 40 hp); Motor Patrol; Scraper Operator; Sideboom; Straddle Carrier; Welder; Bituminous Plant and Paver Operator; Roller over 5 tons; Rail Leveling Machine (Railroad); Tie Placer; Tie Extractor; Tie Tamper; Stone Leveler; Rotary Drill Operator and Blaster; Percussion Drill Operator; Air Track Drill and/or Hammers; Gantrys (under 20,000 lbs); Tencher (wheel type or chain type having 8 inch or larger bucket); Milling Machine; Off-Road Material Haulers.

GROUP 5: Backfiller; Concrete Auto Breaker (large); Concrete Finishing Machines (road type); Rubber Tired Roller; Concrete Batch Hopper; Concrete Conveyor Systems; Grout Pumps; Concrete Mixers (14S or over); Screw Type Pumps and Gypsum Pumps; Tractor, Bulldozer, End Loader (under 40 hp); Trencher (chain type, bucket under 8 inch); Industrial Locomotives; Rollers under 5 tons; Stump Grinder/Chipper (Large); Timber Equipment; Firemen (pile drivers and derricks); Personnel Hoist, Telehandler over 8000 lbs; Robotic Tool Carrier with or without attachments

GROUP 6: Tampers - Compactors (riding type); Assistant Engineer; A-Frames and Winch Trucks; Concrete Auto Breaker; Hydrohammers (small); Brooms and Sweepers; Hoist (tuggers under 5 tons); Boats (Tug, Safety, Work Barges, Launch); Shouldering Machine Operator; Prestress Machines; Screed Operator; Stone Crushers and Screening Plants; Screed Operators (milling machine), Farm or Industrial Tractor Mounted Equipment; Post Hole Digger; Fireman (asphalt plants); Air Compressors over 400 CFM; Generators, over 150 KW; Augers (vertical and horizontal); Air, Electric, Hydraulic Jacks (slipform); Skid Steer Loaders (with or without attachments); Boiler Operators (temporary heat); Refrigeration Plant/Freeze Machines; Power Pack Vibratory/Ultra Sound Drivers and Extractors; Welding Machines; Heaters (mechanical); Pumps; Winches (small electric); Oiler and Greaser; Rotary Drill Tender; Conveyor; Forklifts/Telehandler 8000 lbs & under;

Elevators: Automatic Hoists; Pumps (well points);
Combination Small Equipment Operators

ENGI0139-003 06/05/2017

REMAINING COUNTIES

	Rates	Fringes
Power Equipment Operator		
Group 1.....	\$ 39.72	20.95
Group 2.....	\$ 38.47	20.95
Group 3.....	\$ 37.17	20.95
Group 4.....	\$ 36.64	20.95
Group 5.....	\$ 34.57	20.95
Group 6.....	\$ 33.04	20.95

HAZARDOUS WASTE PREMIUMS:

EPA Level "A" Protection: \$3.00 per hour
EPA Level "B" Protection: \$2.00 per hour
EPA Level "C" Protection: \$1.00 per hour

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, Tower Cranes and Derricks with or without attachments with a lifting capacity of over 100 tons; Cranes, Tower Cranes, and Derricks with boom, leads and/or jib lengths 176 ft or longer.

GROUP 2: Backhoes (Excavators) weighing 130,00 lbs and over; Cranes, Tower Cranes and Derricks with or without attachments with a lifting capacity of 100 tons or less; Cranes, Tower Cranes, and Derricks with boom, leads, and/or jib lengths 175 ft or less; Caisson Rigs; Pile Driver

GROUP 3: Backhoes (Excavators) weighing under 130,000 lbs; Travelling Crane (bridge type); Milling Machine; Concrete Paver over 27 E; Concrete Spreader and Distributor; Concrete Laser Screed; Concrete Grinder and Planing Machine; Slipform Curb and Gutter Machine; Boring Machine (Directional); Dredge Operator; Skid Rigs; over 46 meter Concrete Pump.

GROUP 4: Hydraulic Backhoe (tractor or truck mounted); Hydraulic Crane, 10 tons or less; Tractor, Bulldozer, or End Loader (over 40 hp); Motor Patrol; Scraper Operator; Bituminous Plant and Paver Operator; Screed-Milling Machine; Roller over 5 tons; Concrete pumps 46 meter and under; Grout Pumps; Rotec type machine; Hydro Blaster, 10,000 psi and over; Rotary Drill Operator; Percussion Drilling Machine; Air Track Drill with or without integral hammer; Blaster; Boring Machine (vertical or horizontal); Side Boom; Trencher, wheel type or chain type having 8 inch or larger bucket; Rail Leveling Machine (Railroad); Tie Placer; Tie Extractor; Tie Tamper; Stone Leveler; Straddle Carrier; Material Hoists; Stack Hoist; Man Hoists; Mechanic and Welder; Off Road Material Haulers.

GROUP 5: Tractor, Bulldozer, or Endloader (under 40 hp); Tampers -Compactors, riding type; Stump Chipper, large; Roller, Rubber Tire; Backfiller; Trencher, chain type (bucket under 8 inch); Concrete Auto Breaker, large; Concrete Finishing Machine (road type); Concrete Batch Hopper; Concrete Conveyor Systems; Concrete Mixers, 14S or over; Pumps, Screw Type and Gypsum; Hydrohammers, small; Brooms and Sweepers; Lift Slab Machine; Roller under 5 tons; Industrial Locomotives; Fireman (Pile Drivers and Derricks); Pumps (well points); Hoists, automatic; A-Frames and Winch Trucks; Hoists (tuggers); Boats (Tug, Safety, Work Barges and Launches); Assistant Engineer

GROUP 6: Shouldering Machine Operator; Farm or Industrial Tractor mounted equipment; Post Hole Digger; Auger (vertical and horizontal); Skid Steer Loader with or without attachments; Robotic Tool Carrier with or without attachments; Power Pack Vibratory/Ultra Sound Driver and Extractor; Fireman (Asphalt Plants); Screed Operator; Stone Crushers and Screening Plants; Air, Electric, Hydraulic Jacks (Slip Form); Prestress Machines; Air Compressor, 400 CFM or over; Refrigeration Plant/Freeze Machine; Boiler

Operators (temporary heat); Forklifts; Welding Machines;
Generators; Pumps over 3"; Heaters, Mechanical; Combination
small equipment operator; Winches, small electric; Oiler;
Greaser; Rotary Drill Tender; Conveyor; Elevator Operator

IRON0008-002 06/01/2017

BROWN, CALUMET, DOOR, FOND DU LAC, KEWAUNEE, MANITOWOC,
MARINETTE, OCONTO, OUTAGAMI, SHAWANO, SHEBOYGAN, AND WINNEBAGO
COUNTIES:

	Rates	Fringes
IRONWORKER.....	\$ 31.24	26.97

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor
Day, Thanksgiving Day & Christmas Day.

IRON0008-003 06/01/2017

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH (N.E. 2/3),
WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 33.19	26.97

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor
Day, Thanksgiving Day & Christmas Day.

IRON0383-001 06/01/2017

ADAMS, COLUMBIA, CRAWFORD, DANE, DODGE, FLORENCE, FOREST,
GRANT, GREENE, (Excluding S.E. tip), GREEN LAKE, IOWA,
JEFFERSON, JUNEAU, LA CROSSE, LAFAYETTE, LANGLADE, MARATHON,
MARQUETTE, MENOMINEE, MONROE, PORTAGE, RICHLAND, ROCK (Northern
area, vicinity of Edgerton and Milton), SAUK, VERNON, WAUPACA,
WAUSHARA, AND WOOD COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 34.50	23.82

IRON0512-008 05/01/2017

BARRON, BUFFALO, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, JACKSON,
PEPIN, PIERCE, POLK, RUSK, ST CROIX, TAYLOR, AND TREMPLEAU
COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 36.50	26.45

IRON0512-021 05/01/2017

ASHLAND, BAYFIELD, BURNETT, DOUGLAS, IRON, LINCOLN, ONEIDA,
PRICE, SAWYER, VILAS AND WASHBURN COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 32.04	26.45

LABO0113-002 06/05/2017

MILWAUKEE AND WAUKESHA COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 26.80	21.34
Group 2.....	\$ 26.95	21.34
Group 3.....	\$ 27.15	21.34
Group 4.....	\$ 27.30	21.34

Group 5.....	\$ 27.45	21.34
Group 6.....	\$ 23.29	21.34

LABORERS CLASSIFICATIONS

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence, and Bridge Builder; Landscaper; Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, and Utility Man); Batch Truck Dumper or Cement Handler; Bituminous Worker (Dumper, Ironer, Smoother, and Tamper); Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster and Powderman

GROUP 6: Flagperson; traffic control person

LABO0113-003 06/05/2017

OZAUKEE AND WASHINGTON COUNTIES

	Rates	Fringes
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LABORER

Group 1.....	\$ 26.05	21.34
Group 2.....	\$ 26.15	21.34
Group 3.....	\$ 26.20	21.34
Group 4.....	\$ 26.40	21.34
Group 5.....	\$ 26.25	21.34
Group 6.....	\$ 23.14	21.34

LABORERS CLASSIFICATIONS

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence, and Bridge Builder; Landscaper; Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, and Utility Man); Batch Truck Dumper or Cement Handler; Bituminous Worker (Dumper, Ironer, Smoother, and Tamper); Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated);

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster; powderman

GROUP 6: Flagperson and Traffic Control Person

LABO0113-011 06/05/2017

KENOSHA AND RACINE COUNTIES

	Rates	Fringes
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LABORER

Group 1.....	\$ 25.86	21.34
Group 2.....	\$ 26.01	21.34
Group 3.....	\$ 26.21	21.34
Group 4.....	\$ 26.18	21.34
Group 5.....	\$ 26.51	21.34
Group 6.....	\$ 23.00	21.34

LABORERS CLASSIFICATIONS:

GROUP 1: General laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence, and Bridge Builder; Landscaper; Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, and Utility Man); Batch Truck Dumper or Cement Handler; Bituminous worker (Dumper, Ironer, Smoother, and Tamper); Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster and Powderman

GROUP 6: Flagman; traffic control person

* LABO0140-002 06/05/2017

ADAMS, ASHLAND, BARRON, BAYFIELD, BROWN, BUFFALO, BURNETT, CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DODGE, DOOR, DOUGLAS, DUNN, EAU CLAIRE, FLORENCE, FOND DU LAC, FOREST, GRANT, GREEN, GREEN LAKE, IRON, JACKSON, JUNEAU, IOWA, JEFFERSON, KEWAUNEE, LA CROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, MONROE, OCONTO, ONEIDA, OUTAGAMIE, PEPIN, PIERCE, POLK, PORTAGE, PRICE, RICHLAND, ROCK, RUSK, SAUK, SAWYER, SHAWANO, SHEBOYGAN, ST. CROIX, TAYLOR, TREMPLEAU, VERNON, VILLAS, WALWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 30.71	16.79
Group 2.....	\$ 30.81	16.79
Group 3.....	\$ 30.86	16.79
Group 4.....	\$ 31.06	16.79
Group 5.....	\$ 30.91	16.79
Group 6.....	\$ 27.34	16.79

LABORER CLASSIFICATIONS

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence, and Bridge Builder; Landscaper; Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, and Utility Man); Batch Truck Dumper or Cement Handler; Bituminous Worker (Dumper, Ironer, Smoother and Tamper); Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator, Demolition Burning Torch Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster; powderman

GROUP 6: Flagperson; Traffic Control

* LABO0464-003 06/05/2017

DANE COUNTY

	Rates	Fringes
LABORER		
Group 1.....	\$ 30.99	16.79

Group 2.....	\$ 31.09	16.79
Group 3.....	\$ 31.14	16.79
Group 4.....	\$ 31.34	16.79
Group 5.....	\$ 31.19	16.79
Group 6.....	\$ 27.34	16.79

LABORERS CLASSIFICATIONS:

GROUP 1: General Laborer; Tree Trimmer; Conduit Layer; Demolition and Wrecking Laborer; Guard Rail, Fence, and Bridge Builder; Landscaper; Multiplate Culvert Assembler; Stone Handler; Bituminous Worker (Shoveler, Loader, and Utility Man); Batch Truck Dumper or Cement Handler; Bituminous Worker (Dumper, Ironer, Smoother, and Tamper); Concrete Handler

GROUP 2: Air Tool Operator; Joint Sawyer and Filler (Pavement); Vibrator or Tamper Operator (Mechanical Hand Operated); Chain Saw Operator; Demolition Burning Torch Laborer

GROUP 3: Bituminous Worker (Raker and Luteman); Formsetter (Curb, Sidewalk, and Pavement); Strike Off Man

GROUP 4: Line and Grade Specialist

GROUP 5: Blaster; Powderman

GROUP 6: Flagperson and Traffic Control Person

PAIN0106-008 05/02/2016

ASHLAND, BAYFIELD, BURNETT, AND DOUGLAS COUNTIES

	Rates	Fringes
Painters:		
New:		
Brush, Roller.....	\$ 29.86	16.35
Spray, Sandblast, Steel....	\$ 30.46	16.35
Repaint:		
Brush, Roller.....	\$ 28.36	16.35
Spray, Sandblast, Steel....	\$ 28.96	16.35

* PAIN0108-002 06/01/2017

RACINE COUNTY

	Rates	Fringes
Painters:		
Brush, Roller.....	\$ 33.74	18.95
Spray & Sandblast.....	\$ 34.74	18.95

PAIN0259-002 05/01/2008

BARRON, CHIPPEWA, DUNN, EAU CLAIRE, PEPIN, PIERCE, POLK, RUSK, SAWYER, ST. CROIX, AND WASHBURN COUNTIES

	Rates	Fringes
PAINTER.....	\$ 24.11	12.15

PAIN0259-004 05/01/2015

BUFFALO, CRAWFORD, JACKSON, LA CROSSE, MONROE, TREMPLEAU, AND VERNON COUNTIES

	Rates	Fringes
PAINTER.....	\$ 22.03	12.45

PAIN0781-002 06/01/2017

JEFFERSON, MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
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Painters:

Bridge.....	\$ 30.60	22.80
Brush.....	\$ 30.25	22.80
Spray & Sandblast.....	\$ 31.00	22.80

PAIN0802-002 06/01/2017COLUMBIA, DANE, DODGE, GRANT, GREEN, IOWA, LAFAYETTE, RICHLAND,
ROCK, AND SAUK COUNTIES

	Rates	Fringes
PAINTER		
Brush.....	\$ 28.25	17.72

PREMIUM PAY:

Structural Steel, Spray, Bridges = \$1.00 additional per
hour.-----
PAIN0802-003 06/01/2017ADAMS, BROWN, CALUMET, CLARK, DOOR, FOND DU LAC, FOREST, GREEN
LAKE, IRON, JUNEAU, KEWAUNEE, LANGLADE, LINCOLN, MANITOWOC,
MARATHON, MARINETTE, MARQUETTE, MENOMINEE, OCONTO, ONEIDA,
OUTAGAMIE, PORTAGE, PRICE, SHAWANO, SHEBOYGAN, TAYLOR, VILAS,
WAUSHARA, WAUPACA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
PAINTER.....	\$ 24.89	12.05

PAIN0934-001 06/01/2017

KENOSHA AND WALWORTH COUNTIES

	Rates	Fringes
Painters:		
Brush.....	\$ 33.74	18.95
Spray.....	\$ 34.74	18.95
Structural Steel.....	\$ 33.89	18.95

PAIN1011-002 06/01/2017

FLORENCE COUNTY

	Rates	Fringes
Painters:.....	\$ 24.86	12.23

PLAS0599-010 06/01/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER		
Area 1.....	\$ 39.46	17.17
Area 2 (BAC).....	\$ 35.07	19.75
Area 3.....	\$ 35.61	19.40
Area 4.....	\$ 34.70	20.51
Area 5.....	\$ 36.27	18.73
Area 6.....	\$ 32.02	22.99

AREA DESCRIPTIONS

AREA 1: BAYFIELD, DOUGLAS, PRICE, SAWYER, AND WASHBURN
COUNTIESAREA 2: ADAMS, ASHLAND, BARRON, BROWN, BURNETT, CALUMET,
CHIPPEWA, CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE,
FOND DU LAC, FOREST, GREEN LAKE, IRON, JEFFERSON, KEWAUNEE,
LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE,
MARQUETTE, MENOMINEE, OCONTO, ONEIDA, OUTAGAMIE, POLK,
PORTAGE, RUSK, ST CROIX, SAUK, SHAWANO, SHEBOYGAN, TAYLOR,
VILAS, WALWORTH, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD
COUNTIESAREA 3: BUFFALO, CRAWFORD, EAU CLAIRE, JACKSON, JUNEAU, LA
CROSSE MONROE, PEPIN, PIERCE, RICHLAND, TREMPLEAU, AND

VERNON COUNTIES

AREA 4: MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

AREA 5: DANE, GRANT, GREEN, IOWA, LAFAYETTE, AND ROCK COUNTIES

AREA 6: KENOSHA AND RACINE COUNTIES

PLUM0011-003 05/15/2017

ASHLAND, BAYFIELD, BURNETT, DOUGLAS, IRON, SAWYER, AND WASHBURN COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 40.02	19.53

PLUM0075-002 06/01/2016

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 40.27	21.47

PLUM0075-004 06/01/2016

DODGE (Watertown), GREEN, JEFFERSON, LAFAYETTE, AND ROCK COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 40.52	21.47

PLUM0075-009 06/01/2016

COLUMBIA, DANE, IOWA, MARQUETTE, RICHLAND AND SAUK COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 38.82	20.12

PLUM0111-007 06/01/2016

MARINETTE COUNTY (Niagara only)

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 32.19	21.28

PLUM0118-002 06/01/2016

KENOSHA, RACINE, AND WALWORTH COUNTIES

	Rates	Fringes
Plumber and Steamfitter.....	\$ 40.95	19.95

PLUM0400-003 05/30/2016

ADAMS,BROWN, CALUMET, DODGE (except Watertown), DOOR, FOND DU LAC, GREEN LAKE,KEWAUNEE, MANITOWOC, MARINETTE (except Niagara), MENOMINEE, OCONTO, OUTAGAMIE, SHAWANO, SHEBOYGAN, WAUPACA, WAUSHARA, AND WINNEBAGO COUNTIES

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 34.39	17.65

PLUM0434-002 05/28/2017

BARON, BUFFALO, CHIPPEWA, CLARK, CRAWFORD, DUNN, EAU CLAIRE, FLORENCE, FOREST, GRANT, JACKSON, JUNEAU, LA CROSSE, LANGLADE, LINCOLN, MARATHON, MONROE, ONEIDA, PEPIN, PIERCE, POLK, PORTAGE, PRICE, RUSK, ST. CROIX, TAYLOR, TREMPLEAU, VERNON,

VILAS, AND WOOD COUNTIES

	Rates	Fringes
PIPEFITTER.....	\$ 39.30	17.52

PLUM0601-003 06/04/2017		

DODGE (Watertown), GREEN, JEFFERSON, LAFAYETTE, MILWAUKEE,
OZAUKEE, ROCK, WASHINGTON AND WAUKESHA COUNTIES

	Rates	Fringes
PIPEFITTER.....	\$ 43.86	24.14

PLUM0601-009 06/04/2017		

COLUMBIA, DANE, IOWA, MARQUETTE, RICHLAND AND SAUK COUNTIES

	Rates	Fringes
PIPEFITTER.....	\$ 47.08	20.89

TEAM0039-002 06/01/2017		

	Rates	Fringes
TRUCK DRIVER		
1 & 2 Axle Trucks.....	\$ 27.40	20.48
3 or more axles; Euclids or Dumptr, Articulated Truck, Mechanic.....	\$ 27.55	20.48

SUWI2011-001 11/16/2011		

	Rates	Fringes
WELL DRILLER.....	\$ 16.52	

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate

(weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

March 2017

**NOTICE TO BIDDERS
WAGE RATE DECISION**

The wage rate decision of the Department of Labor which has been incorporated in these advertised specifications is incomplete in that the classifications may be omitted from the Department of Labor's decision.

Since the bidder is responsible, independently, for ascertaining area practice with respect to the necessity, or lack of necessity, for the use of these classifications in the prosecution of the work contemplated by this project, no inference may be drawn from the omission of these classifications concerning prevailing area practices relative to their use. Further, this omission will not, per se, be construed as establishing any governmental liability for increased labor cost if it is subsequently determined that such classifications are required.

There may be omissions and/or errors in the federal wage rates. The bidder is responsible for evaluating and determining the correct applicable rate.

If a project includes multiple types of construction (highway, bridge over navigable water, sanitary sewer and water main, building) and there is not a separate wage determination for this type of work included in the proposal, use the wage determination that is in the proposal.



Proposal Schedule of Items

Page 1 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0002	203.0600.S Removing Old Structure Over Waterway With Minimal Debris (station) 001. 40+36.34	LS	LUMP SUM	_____.
0004	204.0100 Removing Pavement	222.000 SY	_____.	_____.
0006	204.0115 Removing Asphaltic Surface Butt Joints	205.000 SY	_____.	_____.
0008	204.0150 Removing Curb & Gutter	42.000 LF	_____.	_____.
0010	204.0155 Removing Concrete Sidewalk	172.000 SY	_____.	_____.
0012	205.0100 Excavation Common	111.000 CY	_____.	_____.
0014	305.0120 Base Aggregate Dense 1 1/4-Inch	90.000 TON	_____.	_____.
0016	415.0410 Concrete Pavement Approach Slab	182.000 SY	_____.	_____.
0018	455.0605 Tack Coat	5.000 GAL	_____.	_____.
0020	460.2000 Incentive Density HMA Pavement	40.000 DOL	1.00000	40.00
0022	460.5223 HMA Pavement 3 LT 58-28 S	27.000 TON	_____.	_____.
0024	460.5224 HMA Pavement 4 LT 58-28 S	21.000 TON	_____.	_____.
0026	502.0100 Concrete Masonry Bridges	107.000 CY	_____.	_____.
0028	502.3100 Expansion Device (structure) 001. B-40-544	LS	LUMP SUM	_____.
0030	502.3200 Protective Surface Treatment	465.000 SY	_____.	_____.
0032	502.4205 Adhesive Anchors No. 5 Bar	169.000 EACH	_____.	_____.



Proposal Schedule of Items

Page 2 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0034	505.0600 Bar Steel Reinforcement HS Coated Structures	21,460.000 LB	_____.	_____.
0036	506.3005 Welded Stud Shear Connectors 7/8x4-Inch	496.000 EACH	_____.	_____.
0038	506.3015 Welded Stud Shear Connectors 7/8x6-Inch	264.000 EACH	_____.	_____.
0040	509.0302 Preparation Decks Type 2	21.000 SY	_____.	_____.
0042	509.1000 Joint Repair	69.000 SY	_____.	_____.
0044	509.1500 Concrete Surface Repair	339.000 SF	_____.	_____.
0046	509.5100.S Polymer Overlay	625.000 SY	_____.	_____.
0048	509.9025.S Epoxy Injection Crack Repair	408.000 LF	_____.	_____.
0050	509.9026.S Cored Holes 2-Inch Diameter	2.000 EACH	_____.	_____.
0052	516.0500 Rubberized Membrane Waterproofing	11.000 SY	_____.	_____.
0054	517.0600 Painting Epoxy System (structure) 001. B-40-544	LS	LUMP SUM	_____.
0056	517.0900.S Preparation and Coating of Top Flanges (structure) 001. B-40-544	LS	LUMP SUM	_____.
0058	517.1010.S Concrete Staining (structure) 001. B-40-544	5,373.000 SF	_____.	_____.
0060	517.1800.S Structure Repainting Recycled Abrasive (structure) 001. B-40-544	LS	LUMP SUM	_____.
0062	517.3000.S Structure Overcoating Cleaning and Priming (structure) 001. B-40-544	LS	LUMP SUM	_____.



Proposal Schedule of Items

Page 3 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0064	517.4500.S Negative Pressure Containment and Collection of Waste Materials (structure) 001. B-40-544	LS	LUMP SUM	_____.
0066	517.6001.S Portable Decontamination Facility	1.000 EACH	_____.	_____.
0068	601.0331 Concrete Curb & Gutter 31-Inch	108.000 LF	_____.	_____.
0070	601.0600 Concrete Curb Pedestrian	40.000 LF	_____.	_____.
0072	602.0410 Concrete Sidewalk 5-Inch	1,800.000 SF	_____.	_____.
0074	602.0515 Curb Ramp Detectable Warning Field Natural Patina	40.000 SF	_____.	_____.
0076	611.8115 Adjusting Inlet Covers	1.000 EACH	_____.	_____.
0078	619.1000 Mobilization	1.000 EACH	_____.	_____.
0080	623.0200 Dust Control Surface Treatment	200.000 SY	_____.	_____.
0082	637.2220 Signs Type II Reflective SH	69.000 SF	_____.	_____.
0084	642.5201 Field Office Type C	1.000 EACH	_____.	_____.
0086	643.0420 Traffic Control Barricades Type III	10,648.000 DAY	_____.	_____.
0088	643.0705 Traffic Control Warning Lights Type A	21,296.000 DAY	_____.	_____.
0090	643.0900 Traffic Control Signs	16,456.000 DAY	_____.	_____.
0092	643.5000 Traffic Control	1.000 EACH	_____.	_____.
0094	646.1020 Marking Line Epoxy 4-Inch	500.000 LF	_____.	_____.



Proposal Schedule of Items

Page 4 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0096	650.4500 Construction Staking Subgrade	105.000 LF	_____.	_____.
0098	650.5500 Construction Staking Curb Gutter and Curb & Gutter	108.000 LF	_____.	_____.
0100	650.6500 Construction Staking Structure Layout (structure) 001. B-40-544	LS	LUMP SUM	_____.
0102	650.7000 Construction Staking Concrete Pavement	40.000 LF	_____.	_____.
0104	650.8500 Construction Staking Electrical Installations (project) 001. 2195-03-70	LS	LUMP SUM	_____.
0106	650.9000 Construction Staking Curb Ramps	4.000 EACH	_____.	_____.
0108	652.0210 Conduit Rigid Nonmetallic Schedule 40 1-Inch	294.000 LF	_____.	_____.
0110	652.0220 Conduit Rigid Nonmetallic Schedule 40 1 1/2-Inch	98.000 LF	_____.	_____.
0112	652.0225 Conduit Rigid Nonmetallic Schedule 40 2-Inch	321.000 LF	_____.	_____.
0114	652.0230 Conduit Rigid Nonmetallic Schedule 40 2 1/2-Inch	55.000 LF	_____.	_____.
0116	652.0235 Conduit Rigid Nonmetallic Schedule 40 3-Inch	10.000 LF	_____.	_____.
0118	654.0101 Concrete Bases Type 1	3.000 EACH	_____.	_____.
0120	657.6005 Anchor Assemblies Light Poles on Structures	13.000 EACH	_____.	_____.
0122	658.0500 Pedestrian Push Buttons	4.000 EACH	_____.	_____.



Proposal Schedule of Items

Page 5 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0124	690.0150 Sawing Asphalt	110.000 LF	_____.	_____.
0126	690.0250 Sawing Concrete	200.000 LF	_____.	_____.
0128	715.0415 Incentive Strength Concrete Pavement	500.000 DOL	1.00000	500.00
0130	715.0502 Incentive Strength Concrete Structures	762.000 DOL	1.00000	762.00
0132	ASP.1T0A On-the-Job Training Apprentice at \$5.00/HR	2,000.000 HRS	5.00000	10,000.00
0134	ASP.1T0G On-the-Job Training Graduate at \$5.00/HR	3,600.000 HRS	5.00000	18,000.00
0136	SPV.0035 Special 501. LIGHTWEIGHT CONCRETE MASONRY	20.000 CY	_____.	_____.
0138	SPV.0060 Special 001. INLET SCREEN TYPE M	5.000 EACH	_____.	_____.
0140	SPV.0060 Special 003. ADJUSTING WATER BOXES	4.000 EACH	_____.	_____.
0142	SPV.0060 Special 004. UTILITY LINE OPENING	2.000 EACH	_____.	_____.
0144	SPV.0060 Special 201. PEDESTAL BASES BLACK	5.000 EACH	_____.	_____.
0146	SPV.0060 Special 202. TRAFFIC SIGNAL STANDARDS ALUMINUM 3.5-FT BLACK	4.000 EACH	_____.	_____.
0148	SPV.0060 Special 203. TRAFFIC SIGNAL STANDARDS ALUMINUM 13-FT BLACK	1.000 EACH	_____.	_____.
0150	SPV.0060 Special 301. FIBERGLASS/POLYMER CONCRETE PULL BOX 13-INCH x 24-INCH x 24-INCH	2.000 EACH	_____.	_____.



Proposal Schedule of Items

Page 6 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0152	SPV.0060 Special 302. FIBERGLASS/POLYMER CONCRETE PULL BOX 17-INCH x 30-INCH x 24-INCH	2.000 EACH	_____.	_____.
0154	SPV.0060 Special 303. INSTALLING CITY-FURNISHED CONCRETE LIGHT POLE BASE	3.000 EACH	_____.	_____.
0156	SPV.0060 Special 304. INSTALLING CONDUIT INTO EXISTING MANHOLE	1.000 EACH	_____.	_____.
0158	SPV.0060 Special 401. ADJUSTING TES MANHOLE COVER	4.000 EACH	_____.	_____.
0160	SPV.0060 Special 501. BEARING MAINTENANCE (B-40-544)	32.000 EACH	_____.	_____.
0162	SPV.0060 Special 502. REPLACING HIGH STRENGTH BOLTS	385.000 EACH	_____.	_____.
0164	SPV.0060 Special 503. JUNCTION BOX 8x8x6-INCH	1.000 EACH	_____.	_____.
0166	SPV.0060 Special 504. RIVERWALK EXPANSION JOINT	2.000 EACH	_____.	_____.
0168	SPV.0060 Special 505. RIVERWALK EXPANSION JOINT WITH COVER PLATE	2.000 EACH	_____.	_____.
0170	SPV.0085 Special 501. COUNTERWEIGHT BALLAST	20,000.000 LB	_____.	_____.
0172	SPV.0085 Special 502. BRIDGE STRUCTURAL STEEL	31,325.000 LB	_____.	_____.
0174	SPV.0090 Special 001. CONSTRUCTION STAKING CONCRETE SIDEWALK	305.000 LF	_____.	_____.
0176	SPV.0090 Special 002. CONSTRUCTION STAKING UPPER LAYER	105.000 LF	_____.	_____.



Proposal Schedule of Items

Page 7 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0178	SPV.0090 Special 003. MARKING CROSSWALK EPOXY 12-INCH	100.000 LF	_____.	_____.
0180	SPV.0090 Special 004. MARKING CROSSWALK EPOXY 24-INCH	96.000 LF	_____.	_____.
0182	SPV.0090 Special 005. MARKING YIELD LINE EPOXY 36-INCH	24.000 LF	_____.	_____.
0184	SPV.0090 Special 006. MARKING LINE PREFORMED PLASTIC 4-INCH	55.000 LF	_____.	_____.
0186	SPV.0090 Special 007. MARKING CROSSWALK PREFORMED PLASTIC 12-INCH	100.000 LF	_____.	_____.
0188	SPV.0090 Special 008. MARKING LINE PREFORMED PLASTIC 24-INCH	96.000 LF	_____.	_____.
0190	SPV.0090 Special 009. MARKING YIELD LINE PREFORMED PLASTIC 36-INCH	24.000 LF	_____.	_____.
0192	SPV.0090 Special 501. MARINE DOCK FENDERS	324.000 LF	_____.	_____.
0194	SPV.0090 Special 502. 2 LINE ALUMINUM RAILING	323.000 LF	_____.	_____.
0196	SPV.0090 Special 503. REMOVE, REPAIR, PAINT, AND REINSTALL EXISTING TUBULAR RAILING	373.000 LF	_____.	_____.
0198	SPV.0090 Special 504. 1-INCH FIBERGLASS REINFORCED EPOXY CONDUIT	50.000 LF	_____.	_____.
0200	SPV.0105 Special 201. RECTANGULAR RAPID FLASHING BEACON SYSTEM	LS	LUMP SUM	_____.
0202	SPV.0105 Special 501. BUMPER BEAMS	LS	LUMP SUM	_____.



Proposal Schedule of Items

Page 8 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0204	SPV.0105 Special 502. COUNTERWEIGHT MACHINERY	LS	LUMP SUM	_____.
0206	SPV.0105 Special 503. EQUALIZER MACHINERY	LS	LUMP SUM	_____.
0208	SPV.0105 Special 504. SPAN GUIDES	LS	LUMP SUM	_____.
0210	SPV.0105 Special 505. BRIDGE ELECTRICAL WORK	LS	LUMP SUM	_____.
0212	SPV.0105 Special 506. PACKAGED ENGINE GENERATOR	LS	LUMP SUM	_____.
0214	SPV.0105 Special 507. GENERATOR MECHANICAL WORK	LS	LUMP SUM	_____.
0216	SPV.0105 Special 508. BRIDGE HYDRAULIC SYSTEM	LS	LUMP SUM	_____.
0218	SPV.0105 Special 509. FIELD VERIFICATION SURVEY	LS	LUMP SUM	_____.
0220	SPV.0105 Special 510. COUNTERWEIGHT BALANCING CALCULATIONS	LS	LUMP SUM	_____.
0222	SPV.0105 Special 511. TEMPORARY LIFT SPAN SHORING	LS	LUMP SUM	_____.
0224	SPV.0105 Special 512. LIFT SPAN ROADWAY JOINT	LS	LUMP SUM	_____.
0226	SPV.0105 Special 513. LIFT SPAN SIDEWALK JOINT	LS	LUMP SUM	_____.
0228	SPV.0105 Special 514. REFURBISHING EXISTING NAME PLATES	LS	LUMP SUM	_____.
0230	SPV.0105 Special 515. NAME PLATE	LS	LUMP SUM	_____.



Proposal Schedule of Items

Page 9 of 9

Proposal ID: 20171212012 Project(s): 2195-03-70

Federal ID(s): WISC 2018009

SECTION: 0001

Contract Items

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0232	SPV.0165 Special 501. FIBERGLASS SIDEWALK FLOOR PLATES	1,776.000 SF	_____.	_____.
0234	SPV.0165 Special 502. METAL PLATES FOR BIKE LANES	443.000 SF	_____.	_____.
0236	SPV.0180 Special 001. JOINT SEALING	200.000 SY	_____.	_____.
Section: 0001			Total:	_____.
			Total Bid:	_____.

PLEASE ATTACH SCHEDULE OF ITEMS HERE