

HIGHWAY WORK PROPOSAL

Wisconsin Department of Transportation
 DT1502 01/2020 s.66.0901(7) Wis. Stats

Proposal Number: **013**

<u>COUNTY</u>	<u>STATE PROJECT</u>	<u>FEDERAL</u>	<u>PROJECT DESCRIPTION</u>	<u>HIGHWAY</u>
Milwaukee	2984-26-73	WISC 2024353	C Milwaukee, Cherry St; Milwaukee River Bridge P40-864	LOC STR

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: \$410,000.00 Payable to: Wisconsin Department of Transportation	Attach Proposal Guaranty on back of this PAGE.
Bid Submittal Date: May 14, 2024 Time (Local Time): 11:00 am	Firm Name, Address, City, State, Zip Code <div style="text-align: center;">SAMPLE NOT FOR BIDDING PURPOSES</div> This contract is exempt from federal oversight.
Contract Completion Time October 31, 2025	
Assigned Disadvantaged Business Enterprise Goal 7%	

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

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

Subscribed and sworn to before me this date _____

 (Signature, Notary Public, State of Wisconsin)

 (Bidder Signature)

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

 (Print or Type Bidder Name)

 (Date Commission Expires)

 (Bidder Title)

Notary Seal

Type of Work:		For Department Use Only	
Excavation, Base, Asphaltic Surface, Curb and Gutter, Sidewalk, Bascule Bridge Rehabilitation.			
Notice of Award Dated		Date Guaranty Returned	

**PLEASE ATTACH
PROPOSAL GUARANTY HERE**

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.

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:

<https://wisconsin.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 PM local time on the Thursday before the letting. Check the department's web site after 5:00 PM 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 PM 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:

<https://wisconsin.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 department's web site listed above or by picking up the addenda at the Bureau of Highway Construction, 4th floor, 4822 Madison Yards Way, 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:
 4. Have a properly executed annual bid bond on file with the department.
 5. Have a digital ID on file with and enabled by Info Tech Inc. Using this digital ID will constitute the bidder's signature for proper execution of the bidding proposal.
- (2) In lieu of preparing, delivering, and submitting the proposal as specified in 102.6 and 102.9 of the standard specifications, submit the proposal on the internet as follows:
 1. Download the latest schedule of items reflecting all addenda from the Bid Express™ web site.
 2. Use Expedite™ software to enter a unit price for every item in the schedule of items.
 3. Submit the bid according to the requirements of Expedite™ software and the Bid Express™ web site. Do not submit a bid on a printout with accompanying diskette or CD ROM or a paper bid. If the bidder does submit a bid on a printout with accompanying diskette or a paper bid in addition to the internet submittal, the department will disregard the internet bid.
 4. Submit the bid before the hour and date the Notice to Contractors designates.
 5. Do not sign, notarize, and return the bidding proposal described in 102.2 of the standard specifications.
- (3) The department will not consider the bid accepted until the hour and date the Notice to Contractors designates.

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

- (1) Download the latest schedule of items from the Wisconsin pages of the Bid Express web site reflecting the latest addenda posted on the department's web site at:
<https://wisconsin.gov/Pages/doing-bus/contractors/hcci/bid-let.aspx>
 Use Expedite™ software to prepare and print the schedule of items. Provide a valid amount for all price fields. Follow instructions and review the help screens provided on the Bid Express™ web site to assure that the schedule of items is prepared properly.

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

Bidder Name

BN00

Proposals: 1, 12, 14, & 22

- (3) If bidding on more than one proposal in the letting, the bidder may include all proposals for that letting on one diskette or CD ROM. Include only submitted proposals with no incomplete or other files on the diskette or CD ROM.
- (4) The bidder-submitted printout of the Expedite™ generated schedule of items is the governing contract document and must conform to the requirements of section 102 of the standard specifications. If a printout needs to be altered, cross out the printed information with ink or typewriter and enter the new information and initial it in ink. If there is a discrepancy between the printout and the diskette or CD ROM, the department will analyze the bid using the printout information.

- (5) In addition to the reasons specified in section 102 of the standard specifications, proposals are irregular and the department may reject them for one or more of the following:
1. The check code printed on the bottom of the printout of the Expedite™ generated schedule of items is not the same on each page.
 2. The check code printed on the printout of the Expedite™ generated schedule of items is not the same as the check code for that proposal provided on the diskette or CD ROM.
 3. The diskette or CD ROM is not submitted at the time and place the department designates.

B 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)

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

(Signature of Attorney-in-Fact)

NOTARY FOR PRINCIPAL

(Date)

State of Wisconsin)
) ss.
_____ County)

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

(Signature, Notary Public, State of Wisconsin)

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

(Date Commission Expires)

Notary Seal

NOTARY FOR SURETY

(Date)

State of Wisconsin)
) ss.
_____ County)

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

(Signature, Notary Public, State of Wisconsin)

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

(Date Commission Expires)

Notary Seal

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

CERTIFICATE OF ANNUAL BID BOND

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)

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

Instructions for Certification

1. By signing and submitting this proposal, the prospective contractor is providing the certification set out below.
2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective contractor shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective contractor to furnish a certification or an explanation shall disqualify such person from participation in this transaction.
3. The certification in this clause is a material representation of fact upon which reliance was placed when the department determined to enter into this transaction. If it is later determined that the contractor knowingly rendered an erroneous certification in addition to other remedies available to the Federal Government the department may terminate this transaction for cause or default.
4. The prospective contractor shall provide immediate written notice to the department to whom this proposal is submitted if at any time the prospective contractor learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department to which this proposal is being submitted for assistance in obtaining a copy of those regulations.
6. The prospective contractor agrees by submitting this proposal that, should this contract be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department entering into this transaction.
7. The prospective contractor further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," which is included as an addendum to PR- 1273 - "Required Contract Provisions Federal Aid Construction Contracts," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
8. The contractor may rely upon a certification of a prospective subcontractor/materials supplier that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A contractor may decide the method and frequency by which it determines the eligibility of its principals. Each contractor may, but is not required to, check the Disapproval List (telephone # 608/266/1631).

9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
10. Except for transactions authorized under paragraph 6 of these instructions, if a contractor in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department may terminate this transaction for cause or default.

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

1. The prospective contractor certifies to the best of its knowledge and belief, that it and its principals:
 - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offense enumerated in paragraph (1)(b) of this certification; and
 - (d) Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective contractor is unable to certify to any of the statements in this certification, such prospective contractor shall attach an explanation to this proposal.

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STSP'S Revised January 5, 2024

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 2984-26-73, C Milwaukee, Cherry St, Milwaukee River Bridge P-40-0864, 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, 2024 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 (20240105)

2. Scope of Work.

The work under this contract shall consist of the rehabilitation of Structure P-40-864 including major rehabilitation of structural, mechanical, electrical, and architectural elements, roadway approach work, sidewalk and curb replacement, lighting and signal conduit, 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 10 calendar days after the engineer issues a written notice to do so.

Provide the start date to the engineer in writing within a month after executing the contract but at least 14 calendar days before the preconstruction conference. Upon approval, the engineer will issue the notice to proceed within 10 calendar days before the approved start date.

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

Do not begin construction activities prior to July 22, 2024.

The City of Milwaukee will be responsible for raising, lowering, and opening the existing bridge to river traffic, until the contractor is permitted to begin rehabilitation of the bridge.

Provide the proposed sequence of operations, methods of handling traffic, method of operation in the Milwaukee River so as to minimize interference with river traffic, plans for cleanup of the Milwaukee River should spills of oil, soil, or debris from the bridge rehabilitation or other types of pollutants be accidentally discharged into it, and a program of debris removal to prevent accumulation of unsightly debris in the water course in writing within fourteen days before the pre-construction conference. Submit revisions in traffic handling to the engineer for approval at least 48-hours in advance of making any changes in traffic operations. From July 22, 2024, through October 31, 2024, secure one bridge leaf in the down position and operate the other bridge leaf normally for the passage of vessels. From November 1, 2024, through April 1, 2025, both leaves will be secured in the down position and the bridge need not open for the passage of vessels.

Maintain utility service during construction, including but not limited to electricity and heat at the bridge.

Find and obtain a construction staging area.

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

For this contract, the following definitions apply:

Partial Acceptance Date– The calendar date shown in the proposal on or before which the bridge and approaches shall be ready for traffic and operator and maintenance training has been completed. See article Control of Work.

Substantial Completion Date – The calendar date shown in the proposal, on or before which the work included in the contract shall be completed and the 12-month warranty period begins. See article Control of Work.

Final Acceptance Date – The calendar date shown in the proposal, on or before which the work included in the contract shall be completed and the successful conclusion of the 12-month warranty period. See article Control of Work.

Provide and maintain all onsite security, storage, and safety fencing as part of mobilization for the project.

Maintain or provide where necessary, as directed by the engineer, pedestrian access to adjacent properties and businesses. Provide adequate temporary sidewalk and bridging between the curb and the right-of-way line over freshly paved concrete or other obstructions on the sidewalk area at entrances to buildings or as directed by the engineer. The cost of bridging shall be included in the unit bid price for Concrete Sidewalk 5-Inch.

Maintain vehicular access to all business and commercial properties at all times except as noted in the traffic control plans and specifications. The labor and materials required to restore concrete sidewalk, after saw cutting, will be deemed incidental to the bid item 690.0250, Sawing Concrete. Store drums, buckets and other containers related to construction operations in a secure area to prevent vandalism, spills, and unwanted dumping. If an abandoned container is discovered on the project site, notify the WDNR at (800) 943-0003.

Migratory Birds

Swallow or other migratory bird nests have been observed on the following structures; however, deterrent is not needed because (1) construction activities that may affect the underside or interior of structure(s) will not occur during the migratory bird nesting season, or (2) it has been determined that anticipated construction activities on the structure will not disturb active nests. If it is later determined during construction that the nests will be disturbed the contractor shall implement avoidance/deterrent measures or obtain a depredation permit. 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 from April 15 to August 31:

- Structure P-40-0864

Northern Long-eared Bat (*Myotis septentrionalis*)

Northern long-eared bats (NLEB) have the potential to inhabit the project limits because they roost in trees, bridges and culverts. 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).

Ensure all operators, employees, and subcontractors working in areas of known or presumed bat habitat are aware of environmental commitments and avoidance and minimization measures (AMMs) to protect both bats and their habitat.

Direct temporary lighting, if used, away from wooded areas during the bat active season April 1 to October 31, both dates inclusive.

Contractor means and methods to remove trees will not be allowed. If it is determined that trees with a 3-inch or greater diameter at breast height (dbh) need to be removed beyond contractor means and methods, notify the engineer to coordinate with the WisDOT REC to determine if consultation with United States Fish and Wildlife Service (USFWS) is required. The contractor must be aware that the WisDOT REC and/or USFWS may not permit modifications.

Tree Trimming

Mature trees are located in the northeast quadrant of the project. The tree itself falls within private property however branches encroach over the railing and sidewalk in that area. Prune branches within the air space of the work zone that may prohibit efficient construction adjacent to the trees. Take care to not damage the tree; engineer to approve pruning plan prior to work. Payment is incidental to the project. Prune conifers back to a visible lateral bud or branch.

Fish Spawning

There shall be no instream disturbance of the Milwaukee River at Station 2+42 as a result of construction activity under or for this contract, from March 1 to March 15 both dates inclusive, in order to avoid adverse impacts upon the spawning of fish.

Any change to this limitation will require submitting a written request by the contractor to the engineer, subsequent review and concurrence by the Department of Natural Resources in the request, and final approval by the engineer. The approval will include all conditions to the request as mutually agreed upon by WisDOT and DNR.

4. Control of Work.

Modify standard spec 105.11 as follows:

105.11.1 Partial Acceptance

Replace as follows:

Partial acceptance will be made only when all elements of work associated with Structure P-40-864 are completed and the bridge is safely ready for through traffic. Those completed work elements will include:

- Railing and deck surfaces installed.
- Bascule span balanced.
- All signs, gates, signals and communication equipment functional.
- All span machinery installed and finally adjusted.
- Camera system installed, adjusted and tested.
- All lighting, including navigational and decorative lights, installed.
- All electrical controls installed. Span drives must be tuned and meet the required speed/time profiles. All limit switches must be adjusted to final locations. All operator interface screens and alarms must be functioning. Programmable logic controller program must be complete without need for any further adjustments. The electrical controls must have passed a witnessed functional test, including remote operations.
- Operator training.
- Maintenance training.
- Structure is otherwise fully functional and normal movable bridge operation restored.
- Roadway approaches and all associated work completed.

Prior to partial acceptance, all bridge operations will be conducted by the contractor.

105.11.2 Project Acceptance

105.11.2.1.3 Substantially Complete

Supplement standard spec 105.11.2.1.3(1) with the following:

A 30-day “break-in” period for bridge operation is required prior to substantial completion. Partial acceptance of the Structure will be required in order to initiate the “break-in” period. During the “break-in” period, the City of Milwaukee will operate the bridge a minimum of 5 operations every weekday for four consecutive weeks. Each day, at least one operation will use local control. The contractor is to be available to immediately respond to any problems that may arise during this period.

The project is substantially complete, and the engineer will no longer assess contract time if the contractor has completed all contract bid items and change order work and it has been demonstrated that the bridge functions without problems or defects under repeated use (“break-in” period) while being open to traffic. Adjustments, repairs, operating problems, reporting problems, defective equipment or incomplete final documentation will delay substantial completion. Problems deemed by the engineer to be significant, that limit the ability of the department to operate the bridge during the “break-in” period, will require that a new 30 day “break-in” period to be initiated.

Substantial completion will initiate the 12-month warranty period for the operation of the bridge that includes a warranty for all materials, manufactured or fabricated components, workmanship and control system programs provided under this contract. The warranty period extends for a period of 12-months after the date of substantial completion and extends beyond then if the contractor fails to perform to the response time requirements of the warranty.

105.11.2.3 Final Acceptance

Supplement as follows:

The project will not be accepted as final and progress payment retainage will not be reduced until successful completion of the 12-month warranty period.

Warranty

If any of the bridge systems or components provided or modified as a part of the contract fall out of adjustment or fail to function satisfactorily during the warranty period, take prompt action to replace or repair the work. If normal manufacturer's warranties have expired, it remains the contractor's responsibility to repair or replace defective components. Provide the city with any guarantees greater than 12 months that were included with manufactured items procured for this contract.

Respond, and coordinate resolution, within 4 hours of notification of an emergency and within 48 hours of non-emergency situations. An event will be considered an emergency if the bridge is inoperable or if a key safety feature has failed.

Modify standard spec 105.11.2.1.3(1) as follows:

The contractor will be liable for all cost incurred to the department if the bridge is non-operational during the 12-month warranty period. The contractor will be charged under administrative item 801.0104 Failure to Open Road to Traffic.

Modify standard spec 105.11.2.1.3(2) as follows:

During the warranty period subsequent to the 30-day break-in period and the contract deemed substantially complete, failure to respond and coordinate resolution within 48 hours after notification of an emergency or inadequate response or resolution to an emergency will permit the department the right to take corrective action.

5. Traffic.

Cherry Street over the Milwaukee River will be closed to through traffic during construction operations under this contract. Provide access to properties adjacent to the bridge and approaches except for minimum time necessary to undertake construction activities in the immediate vicinity of the property. Do not proceed with any operation until all traffic control devices for such work are in the proper location.

Maintain or provide where necessary pedestrian access to adjacent properties, businesses, and bus stops.

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

Do not park or store equipment vehicles or construction materials within the clear zone on any roadway carrying traffic during non-working hours except at locations and periods of time approved by the engineer.

If any bridge work will require the use of work barge and or falsework that will be in potential hazard to public navigation, appropriate safety signing, marking and lighting must be used according to U.S. Coast Guard standards and per the requirements of article "Construction Over or Adjacent to Navigable Waters."

All posting of parking restrictions required to facilitate construction operations must be approved by the city and will be provided by the City of Milwaukee, Infrastructure Services Division, or as directed by the engineer. Contact Mr. Cameron Potter at (414) 286-3276, at least three working days prior to the start of construction operations.

Notice to Others

Cherry Street is a local bus route. Notify the Milwaukee County Transit System of any closures a minimum of 14 day prior to the closure. Contact David Locher at (414) 343-1727 and Armond Sensabaugh at (414) 343-1728.

Provide 24 hours-a-day availability of equipment and forces to expeditiously restore lights, signs, or other traffic control devices that are damaged or disturbed, according to standard spec 643.3.1(6). The cost to maintain and restore the above items shall be considered incidental to the item as bid and no additional payment will be made.

Supply the name and telephone number of a local contact person for traffic control repair prior to or at the preconstruction conference.

Have available at all times sufficient experienced personnel to promptly install, remove and reinstall the required traffic control devices to reroute traffic during the construction operations.

In the event where emergency vehicles and equipment which provide fire, police, and rescue service for the public need access to properties, the contractor shall cooperate to the fullest extent in accommodating emergency access in the shortest possible time.

Traffic Control

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

Cherry Street, on which this project is located, will be closed to through traffic during construction operations under this contract. The contractor shall be responsible for the signing and maintaining of the road closure. The contractor will be responsible for signing and maintaining the detour route.

Traffic handling, and road closures under this contract shall conform to the plans. A change may only be made if approved by the engineer in advance.

The contractor shall maintain continuous access to the private entrances located near the project limits, during the life of the contract. Any closure of a private entrance shall be coordinated with the owner.

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

Detour

Cherry Street over the Milwaukee River will be closed during bridge rehabilitation work.

Vehicular traffic will be detoured as described below and as shown in the plans:

- Traffic will be detoured via N Doctor Martin Luther King Junior Drive, E Knapp Street, and N Water Street.

Bicycle and Pedestrian traffic will be detoured as described below and as shown in the plans:

- Traffic will be detoured via N Doctor Martin Luther King Junior Drive, E Juneau Avenue, and N Water Street.

6. Holiday and Special Event Work Restrictions.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying Cherry Street traffic during the following holiday and special event periods:

- From noon Friday, August 30, 2024 to 6:00 AM Tuesday, September 3, 2024 for Labor Day;
- From noon Wednesday, November 27, 2024 to 6:00 AM Monday, December 2, 2024 for Thanksgiving;
- From noon Tuesday, December 24, 2024 to 6:00 AM Thursday, December 26, 2024 for Christmas;
- From noon Friday, May 23, 2025 to 6:00 AM Tuesday, May 27, 2025 for Memorial Day.
- From noon Thursday, July 3, 2025 to 6:00 AM Monday, July 7, 2025 for Labor Day;
- From noon Friday, August 29, 2025 to 6:00 AM Tuesday, September 2, 2025 for Labor Day.

Do not remove any existing trees, street light poles, hydrants and other utility poles without the written approval of the engineer. Conduct an on-site visit prior to bidding to determine any special measures required for proper clearance between the trees, hydrants and poles and the construction equipment.

Inform property owners and tenants at least 48 hours prior to removing a driveway approach that serves a property. Schedule sidewalk and driveway approach removal and replacement so that the time lapse between removal and replacement is minimal. Notify Sam Denny, General Manager, (414) 316-5797 or sdenny@lpc.com for Schlitz Park and Lincoln Property Company.

If the contractor can make other access arrangements, agreed to in writing and signed by the contractor and the property owner serviced by the driveway, other sequencing will be allowed when approved by the engineer.

7. Utilities.

This contract does not come under the provision of Wisconsin Administrative Code Ch. Trans 220.

stp-107-066 (20080501)

The utility work plan includes additional detailed information regarding the location of known discontinued, relocated, or removed utility facilities. These can be requested during the bid preparation process or from the project engineer after the contract has been awarded and executed.

Milwaukee Water Works – Engineering (Water) has underground water main along Cherry Street, south of the Milwaukee River as shown below. Conflicts with water main are not anticipated.

STATION	OFFSET	TYPE
3+80	30' LT	Hydrant
4+75 to 5+25	15.1' RT	Underground
5+25	15.1' RT to 23.0' RT	Underground
5+24	19.2' RT	Valve

Milwaukee Metropolitan Sewerage District (Sewer) has sewer along Cherry Street as shown below. Manholes will require adjustments, see plans for locations.

STATION	OFFSET	TYPE
3+85	4.8' LT and 1.0' RT	Manhole
4+77	24.1' RT	Manhole
4+84	32.7' RT	Manhole
4+21	0'	Rectangular Cover
4+24	0'	Rectangular Cover
5+00 to 7+69	37.0' RT to 32.8' RT	Underground
4+77	129.7' RT	Manhole
7+68	128.3' RT	Manhole
4+77 to 7+68	129.0' RT	Underground
7+68 to 8+36	128.3' RT to 23.0' RT	Underground

WE Energies - Electric (Electric) has underground facilities along Cherry Street, south and north of the Milwaukee River as shown below. Two new above ground power service connection racks will be provided at each end of the bridge. During the demolition phase, the contractor shall install two power service connection racks as indicated on plans in coordination with the local utility. Upon installation of new power service conduits in bridge deck is finalized, the contractor shall pull power feeder conductors through the new conduits as indicated on plans. It is expected that the new power service racks will take 20-working days from coordination to installation and 10-working days to pull new conductors. Station and Offset information are indicated below.

STATION	OFFSET	TYPE
1+30	115' LT	West Side Power Service Connection Rack
4+68	8.5' LT	Manhole
4+80	40 LT	East Side Power Service Connection Rack
4+86	80.5' RT	Manhole
5+25	25.9' LT	Pedestal
4+68 to 4+86	8.5' LT to 80.5' RT	Underground
4+68 to 5+25	8.5' LT to 25.9' LT	Underground
4+75 to 5+25	25.3' LT to 25.9' LT	Underground
4+86 to 7+57	80.5' RT to 79.5' RT	Underground
4+68 to 5+34	8.5' LT to 25.6' RT	Underground
7+57 to 7+81	79.5' RT to 11.4 RT	Underground

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

There are wetlands within the right-of-way; however, impacts are not anticipated based on the proposed slope intercepts. Therefore, the department has not requested or obtained a U.S. Army Corps of Engineers Section 404 Permit for this project.

Methods of operations, including preparatory work, staging, site clean-up, storing materials, or causing impacts to wetlands or waters are not permitted. If the contractor requires work outside the proposed slope intercepts, based on their method of operation to construct the project, it is the contractor's responsibility to determine whether a U.S. Army Corps of Engineers Section 404 Permit is required. If a Section 404 Permit is necessary, obtain the permit prior to beginning construction operations requiring the permit. No time extensions as discussed in standard spec 108.10 will be granted for the time required to apply for and obtain the permit. The contractor must be aware that the Corps of Engineers may not grant the permit request.

Information on USACE Section 404 permits is available on the USACE's website:

<https://www.mvp.usace.army.mil/Missions/Regulatory.aspx>

stp-107-054 (20230629)

Section 408 Permit

The department has obtained a U.S. Army Corps of Engineers Section 408 Permit. Comply with the requirements of the permit in addition to requirements of the special provisions. A copy of the permit is available from the regional office by contacting Greg Hafeman at (262) 548-8677.

9. Information to Bidders, Water Work Access.

For transportation to and from floating equipment and temporary or permanent construction that is not readily accessible by other means, provide a six-passenger powerboat furnished with operator, for the exclusive use of the engineer and representatives of the department as may be essential for proper supervision and inspection of the work underway. Also provide and maintain suitable landing docks and steps at approved locations, so constructed as to permit safe and easy access to the boat under all stages of construction.

The boat shall be in good condition, seaworthy in all respects, and shall meet the approval of the engineer. The boat shall be equipped with proper fire extinguishers, life preservers, and other required facilities meeting Coast Guard Regulations. The boat shall be serviced and maintained by the contractor during the entire time of the contract unless otherwise directed by the engineer.

Provide adequate liability insurance, with a minimum coverage of \$500,000, and hold the department and its representative harmless from any and all damage to or caused by the boat while being operated. Provide the department with certificate of insurance for this coverage according to standard spec 107.26.

No separate payment will be made for furnishing the services and performing the work required herein, but the cost thereof shall be included in the unit prices bid for related work items.

10. Construction Over or Adjacent to Navigable Waters.

The Milwaukee River is classified as a federal navigable waterway under standard spec 107.19.

Supplement standard spec 107.19 with the following:

The draw of the Cherry Street Bridge over the Milwaukee River, will, from July 22, 2024, through October 31, 2024, secure one bridge leaf in the down position and operate the other bridge leaf normally for the passage of vessels. From November 1, 2024, through April 1, 2025, both leaves will be secured in the down position and the bridge need not open for the passage of vessels. The contractor may request approval for deviations in timing of the river closure. Approval by the U.S. Coast Guard is not guaranteed.

The Coast Guard has determined that the project will not require a Coast Guard permit as there would be no changes to 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 (OBR), Ninth Coast Guard District, 1240 East 9th Street, Room 2019, Cleveland, Ohio 44199-2060, telephone (216) 902-6084, fax (216) 902-6088 at least 30 days in advance of any construction over the waterway, and seasonally (every 3 months) after initial coordination, for the duration of construction, or as directed by the U.S. Coast Guard, for the duration of construction. Allow an additional 5 days for mail processing once the package has been received by at the U.S. Coast Guard facility. Primary contacts at the U.S Coast Guard are:

Name:	Phone:	Email:
Lee Soule	(216) 902-6085	Lee.D.Soule@uscg.mil
Blair Stanifer	(216) 902-6086	William.B.Stanifer@uscg.mil

Provide the Coast Guard with a schedule and timeframe for rehabilitation of the bascule bridge 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 rehabilitation of the bridge 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 will have to 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.

During non-working hours any barges must be moored outside the bascule span navigable waterway and lighted according to navigation rules. Scaffolding/containment hung from the underside of the bridge within the navigable waterway shall not suspend more than 2 feet below low steel under one leaf of the bridge and shall be lighted with steady burning amber lights on the bottom and four corners during non-working hours. Containment that extends from the bottom of the bridge down to the water will only be allowed during working hours, 24/7 containment from the bridge to the waterline will not be allowed.

Note: If contractor proposes to use barges supported by spud poles driven into the riverbed for construction, the contractor shall avoid spudding of barges in areas with high levels of sediment contamination. It would be preferred for barges to remain in one location during the entirety of the project. If this is not feasible, barge movements and associated spudding/re-spudding must be minimized to the greatest practicable extent to limit potential migration of contaminated riverbed sediments. If spudding/re-spudding of barges is occurring, the contractor must monitor spud depth when lowered to minimize penetration into the streambed. When repeatedly spudding in the same location monitor spuds to ensure they are not routinely sinking deeper than previously noted. If they are, move locations and continue to monitor. Contractor must maintain spuds at the lowest possible depth while moving after raising spuds to keep any adhered streambed material as close to the bottom as possible. Contractor must **not** drag spuds on the streambed while moving barges. Contractor must raise spuds slowly to prevent excavation of the streambed by suction and allow time for any adhered streambed material to release off the spuds prior to moving. Record when and where spuds were dropped with depths during construction.

Before beginning the project, the contractor must coordinate with DOT and DNR to determine appropriate locations for barge spudding near the bridge to avoid areas with high levels of sediment contamination.

Barge spudding/re-spudding that impacts the stream bed is considered an in-water disturbance and must adhere to in-stream disturbance timeout period, with no work occurring between March 1 to June 15, with both dates inclusive of this timeout period.

Due to the presence of unique fisheries, no barges will be placed at the north-west downstream quadrant of the Cherry Street Bridge. (Cherry Street and Manpower Place)

Provide signage in the navigable waterway upstream and downstream from Cherry Street Bascule Bridge in the Milwaukee River navigable waterway to provide notice to mariners of bridge work ahead.

Costs for furnishing, maintaining, moving, and installing lights and signs required in these special provisions are incidental to the contract.

11. 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 before 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. Guidelines from the Wisconsin Department of Natural Resources for disinfection are available at:

<http://dnr.wi.gov/topic/invasives/disinfection.html>

Use the following inspection and removal procedures:

- Before leaving the contaminated site, wash machinery and ensure that the machinery is free of all soil and other substances that could possibly contain exotic invasive species;
- Drain all water from boats, trailers, bilges, live wells, coolers, bait buckets, engine compartments, and any other area where water may be trapped;
- Inspect boat hulls, propellers, trailers and other surfaces. Scrape off any attached mussels, remove any aquatic plant materials (fragments, stems, leaves, seeds, or roots), and dispose of removed mussels and plant materials in a garbage can before leaving the area or invested waters; and
- Disinfect your boat, equipment and gear by either:
 - 4.1. Washing with ~212 F water (steam clean), or
 - 4.2. Drying thoroughly for five days after cleaning with soap and water and/or high pressure water, or
 - 4.3. 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)

12. 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 7:00 AM the following day, unless prior written approval is obtained from the engineer.

stp-107-001 (20060512)

13. 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, in Standard Specifications for Highway and Structure Construction, and as may be 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 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 operator 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 4 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 4 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 1 to 3 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 engineer's 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 Training, Manuals and Spare Parts 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, parts lists, and "As-Built Drawings" in the costs of the bid items with which the submittals are associated. However, Operation and Maintenance manuals are paid for under the item Training Manuals and Spare Parts.

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.

14. Bridge Machinery – General.

A Description

A.1 General

This section describes the general requirements for the work to be completed for the bridge's mechanical operating and stabilizing systems. Provide bridge machinery that meets the requirements of AASHTO LRFD Movable Highway Bridge Design Specifications, Third Edition, 2023, hereafter referred to as AASHTO Movable, and these contract documents.

The Bridge Machinery work for this project consists of the following items of work:

1. Span Drive Machinery Refurbishment
1. Center Lock Refurbishment
2. Heel Block Refurbishment
3. Trunnion and Trunnion Bearing Refurbishment

The cost of work for the bridge's mechanical operating and stabilizing systems is included under the bid items for the above listed items of work.

A.2 Manufacturer's Product Data

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

Include in the submittal, 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.3 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. Provide fits and finishes as specified according to ANSI B46.1 and ANSI B4.1.

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, the method of lubrication, location and type of all lubrication, and vent fittings. 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:

AASHTO	American Association of State Highway Transportation Officials
ABMA	American Bearing Manufacturers Association
AGMA	American Gear Manufacturers Association
AISI	American Iron and Steel Institute
ANSI	American National Standard Institute
ASME	American Society of Mechanical Engineers
ASTM	ASTM International
AWS	American Welding Society
NEMA	National Electrical Manufacturers Association
NLGI	National Lubricating Grease Institute
OSHA	Occupational Safety and Health Act
SAE	Society of Automotive Engineers Standard
Specifications	State of Wisconsin Standard Specifications for Highway and Structure Construction, 2017 edition
SSPC	Steel Structures Painting Council

Furnish assembly and erection drawings with identifying marks and essential dimensions for locating parts and assemblies. The use of opposite hand or mirror image assembly 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 according to article "Shop drawings and Submittals". 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.

A.4 Operation and Maintenance Manuals

Furnish complete descriptive literature, catalogue cuts, reduced size shop drawings and other information required for proper operation and maintenance for the bridge machinery systems. Work related to this is further described in the special provision "Training, Manuals and Spare Parts".

A.5 Quality Assurance

A.5.1 Standard Products

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 use 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.5.2 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.5.3 Codes and Standards

Furnish all items for each of the machinery related pay items in compliance with the applicable requirements of the latest standards and codes of, but not limited to, those organizations designated above. 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.5.4 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 millwrights or experienced machinists 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 machinery 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 millwrights and experienced 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.5.5 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.5.6 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 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.5.7 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 to the department. 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 Steel Castings

Provide steel castings that are true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blow holes, and other defects. Sandblast or otherwise effectively clean castings of scale and sand, to present a smooth, clean, and uniform surface. Finish all edges of castings with rounded corners and provide ample fillets on all inside angles. Provide adequate material allowance for all surfaces requiring finish for machining to finish dimensions. Finish all surfaces of castings in contact with other metal to 125 micro-inches 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. Provide machined bosses 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. Weld minor defects, which do not impair the strength, by an approved process, with the approval of the engineer, and inspect by magnetic particle examination.

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. Reject steel castings that do not have adequate thickness to "clean up" during machining.

Retain and deliver all patterns to the engineer. Make all patterns for castings neat, strong and durable of thoroughly seasoned, first-class pattern lumber. Proportion the pattern to suit the shrinkage of the particular metal to be cast from them and allow adequate thickness for tool finish mating with other components. Round the outstanding unfinished edges of all ribs, bases, etc., to a radius of one-fourth the thickness of the ribs, bases, etc., and fit inside corners with wood or leather fillets with a radius of at least one-half the thickness of the thinnest member forming the corner.

Provide all patterns with lifting and rapping plates, set flush with their surfaces. Provide a metal plate bearing the letters "CHERRY STREET BRIDGE" in sharp gothic style, at least three-fourths inch high in each pattern outside of the casting region.

Stain patterns black on surfaces unfinished on castings, red on surfaces tool finished, and yellow or clear shellac on core points. Varnish the patterns before use with first-class pattern shellac, and repair after final use. Clean and varnish again before delivery to the engineer.

All patterns shall be subject to inspection and approval by the engineer before castings are made from them and again on final delivery to the engineer.

B.2 Steel Forgings

Use annealed forgings where possible. Reduce to size all forged shafts from a single bloom or ingot until perfect homogeneity is secured. For all forged shafts provide a bloom or ingot cross-sectional area of at least three times that required after finishing. Forge material only at temperature greater than or equal to a red-heat. Provide forged rounds for shafts that are true, straight, and free from all injurious flaws, seams, or cracks. Prior to heat treatment, bore a hole lengthwise through the forging for shafts with a finish diameter greater than eight inches. Provide forgings with adequate material allowance for machining to finish dimensions. Reject all shafts with areas that do not clean up after machining. Inspect forgings with ultrasonic evaluation per the conditions of ASTM A668 supplement requirement S7 and Practice A388. Submit all test results to the engineer. For forgings that are to be welded to plate steel, ensure that the forgings meet the requirements of ASTM A668 supplement requirement S4 for low carbon content.

B.3 Shafting and Pins

Furnish shafts that are accurately finished, round, smooth, and straight; and when turned to different diameters, provide rounded fillets at shoulders and chamfers at shaft ends. At the journal-bearing areas on shafts and pins provide surfaces that are accurately turned, ground, and polished with no trace of tool marks or scratches on the journal surface or adjoining shoulder fillets. Finish journal surfaces to the limits specified in AASHTO Movable.

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. For shafts with holes, install plugs prior to final assembly at each end of shaft.

B.4 Fasteners

B.4.1 General

Sub-drill 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.

Furnish positive locks for all nuts. Provide double nuts for all connections requiring occasional opening or adjustment. For connections with single nuts, provide lock washers made of tempered steel and conforming to the SAE regular dimensions. Provide lock washers of material that meets the SAE tests for temper and toughness.

Use beveled washers 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.

Provide bolts, nuts, and cap screws that conform to the coarse thread series and 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, furnish finished bosses or spot-faced seats. Provide square bolt heads for recesses in castings. Spot face all bolt holes through unfinished surfaces for the head and nut, square with the axis of the bolts.

B.4.2 Turned Bolts (Machinery to Machinery Supports)

Use turned bolts for all connections of machinery to supports. Provide turned bolts that conform to the requirements of ASTM Specifications ASTM F3125 Gr. A449. Provide nuts, and hardened washers that conform to the requirements of ASTM Specifications A563, and F436, respectively. Turn the diameter of the shank such that it is 1/16-inch larger than the diameter of the threads. Supply a surface finish of 63 micro-inches as measured under ANSI B46.1. Use hexagonal heads and nuts according to the heavy series specified in ANSI B18.2.1. Use two nuts or one nut and a lock-washer on turned bolts. Lock washers will only be permitted if approved by the engineer. Carefully ream holes for turned bolts in mating structure to provide for an ANSI B4.1 LC6 fit with the body of the bolt.

B.4.3 High Strength Bolts (Machinery Supports to Steel Structure)

Use high strength bolts for connections of supports to steel bridge structure. Provide bolts, nuts, and hardened washers that conform to the requirements of ASTM Specifications F3125 Gr. A449, A563, and F436, respectively. Drill holes for bolts 1/32 inch larger than the diameter of the bolt. All high strength bolts, nuts, and washers shall be zinc coated with a Class 50 mechanically deposited zinc coating according to the requirements of ASTM B695.

B.4.4 Anchor Bolts (Machinery Supports to Concrete Structure)

Use embedded stainless steel bolts that conform to ASTM F593 for connecting machinery supports to concrete structures. Use stainless steel nuts that conform to the requirements of ASTM F594, and stainless steel washers. Use double nuts on all anchor bolt connections.

B.4.5 Socket Head Screws

Where socket-head cap screws are used, provide screws that conform to ANSI B18.3, made of cadmium-plated heat-treated alloy steel, and furnished with a self-locking nylon pellet embedded in the threaded section. Provide set screws of the headless, safety type; threads of the coarse thread series; and cut points. Do not use set screws to transmit torque nor as the fastening or stop for any equipment that contributes to the stability or operation of the bridge.

B.5 Keys and Keyways

Provide square and rectangular keys and keyways that meet ANSI B.17.1, except where specified herein. Provide closed-end, milled keyways in the shaft to hold all keys in place. Provide clearance between keyways and bearings. Where one key is used, provide a key with an ANSI B4.1 LC4 fit with the keyway. Where two keys are used locate them 120 degrees apart and provide an ANSI B17.1 Class 2 fit between keys and keyways. Finish keys and keyways to a roughness value of 63 micro-inches as measured under ANSI B46.1.

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

B.6 Bearings and Bushings

For new bearings select anti-friction bearings to provide for an ABMA rated L-10 life of 40,000 hours. Use pillow block bearings, adapter mounted, self-aligning, fixed or expansion versions as required. Use cast steel housings capable of withstanding the design loads in any direction, including radial up-lift. 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 in the field. Provide units that are grease lubricated and have provision for re-lubrication through fittings in the housings. Provide triple lip shaft seals, mounted in the housings, capable of retaining the lubricant and preventing the entry of water and foreign materials.

For rehabilitated bearings, provide bronze bushings of ASTM B22 Alloy UNS C91100. Finish machine the outside diameters of the bushings to provide an ANSI Class LC-1 fit with their associated housing bores, unless specified otherwise in the Plans or herein. 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. Liners shall be rolled bronze or brass. At least 1/8 inch of the liner thickness shall be of laminated construction capable of adjustment in increments of 0.003 of an inch. Polish bushing-bores to a surface texture of 16 micro-inches according to ANSI B46.1 and provide an ANSI B4.1 RC6 fit between bushing and shaft. Provide grease grooves that have smooth edges that blend smoothly in the bearing surface. Provide entry holes for the grease fittings that intersect and lie completely within the grooves. Provide machine cut grease grooves.

B.7 Shims

Provide stainless steel shims required for leveling and alignment conforming to ASTM A240, Type 304, sub-drilled for all bolts that pass through and trimmed to the dimensions of the assembled unit. Final drill and ream the shims at assembly with the components and structures. Provide shim packs capable for adjustment from 0 inches to twice the nominal shim pack dimension. Provide sufficient thicknesses to permit 1/64 inch variations of the shim allowance plus one full allowance shim. Corrosion resistant precision thickness shims will be permitted if desired by the contractor. Shims with slots or slotted holes will not be permitted.

B.8 Welding

Perform all welding required or designated in the plans in conformance with the appropriate American Welding Society Specification D1.5. Ultrasonically inspect all welds used to fabricate machinery per AWS D1.5 for compression welds. Stress relieve all weldments. 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 welding procedures with the working drawings to the engineer for approval.

B.9 Machinery Base Supports and Brackets

Provide machinery base supports that are constructed of welded steel plate. Select plates of proper thickness to allow for final machining. Indicate initial and final machined thicknesses on shop drawings.

Mill top and bottom surfaces of all machinery base supports after fabrication to provide a uniform surface. All surfaces requiring milling shall have adequate material allowance for milling to the minimum finish dimensions as required by AASHTO Movable or as shown on the Plans.

Hot-dip galvanize and paint with the approved two-coat paint system all machinery supports and brackets after fabrication.

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

Examine all fillet welds and partial penetration groove welds by the magnetic-particle method according to the requirements of Section 6 of AASHTO/AWS D1.5. Examine all complete joint penetration groove welds in butt joints by radiographic testing. Examine all complete penetration groove welds in T-joints and corner joints by ultrasonic testing.

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.

B.10 Machinery Guards

Provide machinery guards for all moving parts readily accessible to personnel, including but not limited to the following:

1. Couplings
2. Unused shaft extensions
3. Brakes
4. Instrument drives and limit switches

Design and fabricate machinery guards, including new ones for the main drive pinions of each of the four racks, according to ANSI B15.1. Provide new galvanized steel guards for the main drive pinions having the same configuration as the existing ones and having stainless steel hinges and pins.

Fabricate guards from expanded metal and structural shapes to withstand a load of 350 pounds applied vertically without any permanent deformations. Provide finger tightened fasteners, hinged covers and other features to enable removal by one person and for easy access toward maintenance and inspection. Bolt the guards to the machinery supports, adjacent structural steel or supporting concrete. The machinery guards are not shown on the Plans. Provide complete details of all machinery guards on shop drawings.

Unless otherwise indicated or specified, provide machinery guards of AISI Type 316 stainless steel, minimum 12-gauge. Removal of the guard shall not require disassembly of any machinery component.

Locate removable covers to provide access to lubrication fittings enclosed by the guard.

Machinery guards shall be provided with removable hinged or bolted covers for access to lubrication fittings enclosed by the guard. Phenolic nameplates shall be provided on these covers with lubrication instructions.

B.11 Epoxy Grout and Sealant for Supports on Concrete Surface.

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.12 Lubrication

B.12.1 General

Standardization of the lubrication for the mechanical and electrical systems is required. Coordinate with all the system suppliers to ensure that the type of lubricant supplied shall be kept to as few as possible.

B.12.2 Lubrication Fittings

Provide all bearings and other grease lubricated machinery components with ¼ NPS giant button head lubrication fittings with ball check, unless indicated on plans.

Locate the fittings to conveniently facilitate lubrication. Connect the lubrication ports to central stations using ¼ 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.12.3 Lubrication Charts

Furnish three copies on laminated sheet or mylar (size 11 inches by 17 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.

Submit the lubrication chart to the engineer for review and approval as a working drawing according to this Special Provision. Final lubrication chart shall not be made until the chart has been approved by the engineer.

B.13 Spare Parts

Provide two complete sets of seals for each type of antifriction bearing. See additional requirements for spare parts in specific sections.

C Construction

C.1 Shop Fabrication

Provide the department no less than 10 working days' notice before beginning work at foundries, forge and machine shops so that inspections and tests may be arranged. Provide the department with the names and locations of casting, forging and machining suppliers; 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 Guarantees and Warranties

Assign to the department all manufacturer's 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.

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 city.

C.5 Shipment and Storage

C.5.1 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 co-mingle 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.5.2 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. Tag all individual spares with clear identification using the part number 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.6 Erection

C.6.1 General

Erection and adjustment of machinery shall be by millwrights or experienced machinists with demonstrated skill in this type of work and meeting the experience and qualification requirements listed earlier.

C.6.2 Alignment and Bolting

Erect and assemble the machinery according to part number and match marks, and according to manufacturer's 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 ¼ inch undersized, sub-drilled 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.6.3 Coatings

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

C.7 Painting

C.7.1 General

Clean and paint all unfinished surfaces of machinery and equipment as required by the department using a system listed on Wisconsin Department of Transportation master list of pre-approved 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.

Hot-dip galvanize and paint structural steel components with the two coat system specified.

C.7.2 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.7.3 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.7.4 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.8 Contractor' 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 bascule span is balanced as required.

The department's representative shall accompany the contractor during his final inspection to determine if the bridge is ready for field testing.

C.9 Field Testing

When the bridge is ready for field testing, notify the engineer no less than 15 days before scheduling the tests. Inform all 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 bascule 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. Span Drive Machinery
2. Center Lock Machinery
3. Heel Block Support

For each main motor, open and close the bridge ten times consecutively without problems prior to final acceptance. Lowering of each bascule leaf without electrical power is also required to be demonstrated.

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.

D (Vacant)

E Payment

The cost of work required by Bridge Machinery-General is included in the bridge machinery bid items.

15. Abatement of Asbestos Containing Material P-40-864, Item 203.0211.S.

A Description

This special provision describes abating asbestos containing material on structures.

B (Vacant)

C Construction

Aileen Zebrowski, License Number All-273059, inspected Structure P-40-864 for asbestos on July 6 and July 9, 2021, Regulated Asbestos Containing Material (RACM) was found on this structure in the following locations and quantities:

Sample #	Location	Description	Texture	Result (Point Count Takes Precedence Over PLM)	Homogenous Code	Area (sq ft)
4A-ET-B	East Tower - Basement	Blue Partition	Compact	18% Chrysotile	MgyPart	416
5A-ET-B	East Tower - Basement	Gray Pipe Wrap Over Cellulose	Compressed	10% Chrysotile	TgyPoC	34
6A-ET-B	East Tower - Basement	Gray Joint & Plaster	Compressed	8% Chrysotile	TgyJ-P	3
14A-ET-B	East Tower - Basement	White Ceiling Patch	Compressed	18% Chrysotile	MwCPatch	2
19A-WT-B	West Tower - Basement	Gray Joint & Plaster	Compressed	15% Chrysotile	TgyJ-P	3

The RACM on this structure must be abated by a licensed abatement contractor. A copy of the inspection report is included in the bid package or available from Jonathan Thomas, PE, Structural Design Manager, City of Milwaukee DPW, 841 North Broadway, Room 907, Milwaukee, WI 53202; (414) 286-0463; Jonathan.thomas@milwaukee.gov. According to NR447 and DHS159, ensure that DNR or DHS receives a completed Notification of Demolition and/or Renovation (DNR Form 4500-113 (R 3/20), or subsequent revision) via U.S. mail, hand-delivery, or using the online notification system at least 10 working days before beginning any construction or demolition. Pay all associated fees. Provide a copy of the completed 4500-113 form and the abatement report to Greg Hafeman, (262) 548-8677, greg.hafeman@dot.wi.gov and via email to dothazmatunit@dot.wi.gov or via US mail to DOT BTS-ESS attn: Hazardous Materials Specialist, 5 South S.513.12, PO Box 7965, Madison, WI 53707-7965. In addition, comply with all local or municipal asbestos requirements.

Use the following information to complete WisDNR form 4500-113:

- Site Name: Structure P-40-0864, West Cherry Street over the Milwaukee River
- Site Address: Cherry Street, Section 20 / T7N / R 22
- Ownership Information: City of Milwaukee Department of Public Works, 200 E Wells Street, Milwaukee, WI 53202
- Contact: Jonathan Thomas
- Phone: (414) 286-0463
- Age: 84 years. This structure was constructed in 1940.
- Area: 2262 SF of deck

Insert the following paragraph in Section 6.g.:

- If asbestos not previously identified is found or previously non-friable asbestos becomes crumbled, pulverized, or reduced to a powder, stop work immediately, notify the engineer, and the engineer will notify the department's Bureau of Technical Services at (608) 266-1476 for an emergency response as specified in standard spec 107.24. Keep material wet until it is abated or until it is determined to be non-asbestos containing material.

D Measurement

The department will measure Abatement of Asbestos Containing Material (Structure) by each structure, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
203.0211.S	Abatement of Asbestos Containing Material P-40-864	EACH

Payment is full compensation for submitting necessary forms; removing all asbestos; and for properly disposing of all waste materials.

16. Removing Poles, Item 204.9060.S.

A Description

This special provision describes removing existing steel, and/or aluminum poles as indicated on plans. Stockpiling, protecting, and then coordinating pickup of removed poles by the City of Milwaukee. All work shall be according to standard spec 651.

B Materials

Existing poles, including luminaire(s), bracket arm(s), clamp(s), conduit, cabling, and any other equipment mounted to the poles.

C Construction

Disconnect and strip all cables and wiring that are mounted on or inside the pole and carefully remove the bracket arm(s), clamp(s), luminaire(s), and other non-street lighting materials from the pole. Then remove pole and backfill resulting hole, for backfilling follow standard spec 206.2.

Salvaging Materials

Only the following Poles: Wood, steel, and aluminum.

Bracket arm(s), Bracket Arm Clamp(s) and hardware.

LED luminaires, and decorative luminaires.

All ballasts (High Pressure Sodium & LED "OV20")

Breakaway transformer Pedestal(s)

Side Pole Mounted Wiring Pedestal(s) (Green in Color)

Carefully remove materials designated for salvage to avoid damage. Place salvaged materials in neat piles outside construction limits but within the right-of-way, at locations the street lighting Field Supervisor or Street Lighting Engineer approves. Stockpile materials designated for salvage without contaminating the material with dirt or foreign matter.

Protect and store the removed and salvaged street lighting equipment until pickup can be coordinated with the City of Milwaukee. Coordinate pickup of all the materials. Call three working days in advance, Monday through Friday, to coordinate with Neal Karweik, (414) 286-5943 office / (414) 708-4245 cell.

Disposing of Materials

Materials for Disposing of safely:

- Concrete pole(s)
- Stone and brick
- Conduit and Cabling
- High- and Low-Pressure Sodium Luminaires
- And other material not designated for salvage.

Follow the Wisconsin State Law when disposing of HID luminaires appropriately away from the project area. Contractor is responsible for filling out all necessary paperwork for disposing of materials.

Wisconsin State law, as well as laws in many other states, prohibits the disposal of lamps and bulbs that contain heavy metals, such as mercury, in sanitary landfills. This ban includes fluorescent (linear and U-tube), compact fluorescent (CFL), mercury vapor, metal halide, high- pressure sodium and low-pressure sodium lamps. They must be recycled or disposed of as hazardous waste. The lamps should not be broken to prevent the release of mercury and are best stored in the packaging the replacement bulbs come in until being recycled.

HID lamp ballasts contain PCB or polychlorinated biphenyls which are regulated as a hazardous waste and cannot be disposed of in landfills per Wisconsin State law. Ballasts that do not contain PCB are marked "NO PCB" and can be recycled (preferable) or disposed of in a landfill. If ballasts are not marked, it must be treated as if it contains PCB. If ballasts are leaking, they require special handling. Contact your local hazardous waste response coordinator for assistance.

D Measurement

The department will measure Removing Poles as each individual pole or stub, 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
204.9060.S.310.	Removing Poles	EACH

Payment is full compensation for disconnecting any necessary wiring, removing the poles and equipment mounted on the poles; temporarily storing the pole and any equipment attached to it, excavating, backfilling, and disposals; and for coordinating pickup of salvaged material.

stp-204-025 (20230113)

17. Removing Aerial Cable, Item 204.9090.S.

A Description

The work under this item consists of removing temporary overhead service lines as shown on the plans; including all associated guy wires, anchors, and electrical wire; and removing materials from the site.

B (Vacant)

C Construction

Contractor shall properly dispose of materials off site.

D Measurement

The department will measure Removing Aerial Cable by linear foot pole to pole.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
204.9090.S	Removing Aerial Cable	LF

Payment is full compensation for all work and disposal of materials.

stp-204-025 (20230113)

18. Preformed Elastomeric Compression Joint Sealer.

Add the following to standard spec 502.3.6.3.2:

(7) The compression joint material provided shall have properties matching EMSEAL Bridge Expansion Joint System or approved equal. Galvanized steel sidewalk cover plates with a slip-resistant surface are incidental to the bid item Compression Joint Sealer Preformed Elastomeric 2-Inch.

19. Removing Bearings, P-40-864, Item 506.7050.S.

A Description

This special provision describes raising the girders and removing the existing bearings, as the plans show.

B (Vacant)

C Construction

Raise the structure's girders and remove the existing bearings as the plans show.

Obtain prior approval from the engineer for the method of jacking the girders and of supporting them as required.

D Measurement

The department will measure Removing Bearings, P-40-864 by the unit for each bearing removed, 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
506.7050.S	Removing Bearings, P-40-864	EACH

Payment is full compensation for raising the bridge girders; and for removing the old bearings.

Cost of furnishing and installing the bearings will be paid for under separate bid items.

stp-506-035 (20130615)

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

A Description

This special provision describes repairing structural cracks in piers using the epoxy injection method and coring 2 inch diameter core samples the repaired cracks.

Conform to standard spec 509 as modified in this special provision.

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 ±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:

- 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.
- 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)

21. Preparation and Coating of Top Flanges, P-40-864, Item 517.0901.S.

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 before 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 containers 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 P-40-864 as a single unit for each structure, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
517.0901.S	Preparation and Coating of Top Flanges P-40-864	EACH

Payment is full compensation for preparing and cleaning the designated surfaces; and for furnishing and applying the coating.

stp-517-010 (20210708)

22. Concrete Staining, P-40-864, Item 517.1010.S.

A Description

This special provision describes providing a two coat concrete stain on the exposed concrete surfaces of structures as the plans show.

B Materials

B.1 Mortar

Use mortar for sack rubbing the concrete surfaces as given in standard spec 502.3.7.5 or use one of the following products:

Preblended, Packaged Type II Cement:	Tri-Mix by TK Products
	ThoroSeal Pearl Gray by Thoro Products

The mortar shall contain one of the following acrylic bonding admixtures mixed and applied according to manufacturer's recommendations:

Acrylic Bonding Admixture:	TK-225 by TK Products
	Achro 60 by Thoro Products
	Achro Set by Master Builders

B.2 Concrete Stain

Use concrete stain manufactured for use on exterior concrete surfaces, consisting of a base coat and a pigmented sealer finish coat. Use the following products, or equal as approved by the department, as part of the two coat finish system:

Tri-Sheen Concrete Surfacer, Smooth by TK Products
Tri-Sheen Acrylic by TK Products
TK-1450 Natural Look Urethane Anti-Graffiti Primers by TK Products
Safe-Cure & Seal EPX by Chem Masters
H&C Concrete Stain Solid Color Water Based by Sherwin-Williams

B.3 Concrete Color

The department will select one of the following colors for the stain to be used:

Federal Color 13522
Federal Color 33448

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, before staining.

C.2 Preparation of Concrete Surfaces

Provide a sack rubbed finish as specified in 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

Before 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, before 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, P-40-864 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	Concrete Staining, P-40-864	SF

Payment is full compensation for furnishing and applying the two coat system; for preparing the concrete surface; and for preparing the sample panels.

23. 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 3 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 equipment to allow the inspector to closely observe all affected surfaces. The scaffolding, with appropriate safety devices, shall meet the approval of the engineer.

stp-517-005 (20150630)

24. Structure Repainting Recycled Abrasive, P-40-864, Item 517.1801.S.

A Description

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

A.1 Areas to be Cleaned and Painted

All structural metal surfaces of:

- Structure P-40-864 31,450 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 the plans show according to Federal Standard Number AMS Standard 16314. 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 before any application of paint.

C Construction

C.1 Surface Preparation

Before 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 before 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 7ug/cm², 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 before paint application. If rust bloom occurs before 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 before 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 Recycled 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, P-40-864 as a single unit for each structure, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
517.1801.S	Structure Repainting Recycled Abrasive, P-40-864	EACH

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 (20210708)

25. Negative Pressure Containment and Collection of Waste Materials, P-40-864, Item 517.4501.S.

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 labeling and storing waste material in approved hazardous waste containers.

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 before 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, P-40-864 as a single unit for each structure, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
517.4501.S	Negative Pressure Containment and Collection of Waste Materials, P-40-864	EACH

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 (20230113)

26. Labeling and Disposal of Waste Material.

The EPA ID number for Structure P-40-864 is WIR000183632

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.

Fill out form DT 1231, <https://wisconsin.gov/Documents/formdocs/dt1231.docx> and email it to the waste management contractor, the region environmental coordinator, and the DOT Hazmat unit mailbox (dothazmatunit@dot.wi.gov) a minimum of 10 working days in advance to request container drop-off or pickup. Using the form, provide the waste management contractor with the project ID, structure number, EPA ID, and the agreed-upon location for container staging. Contact information for the waste management contractor is located on the WisDOT Internet site at:

<https://wisconsin.gov/Documents/doing-bus/eng-consultants/cnslt-rsrcs/environment/hazwaste-contacts.pdf>

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 (20230113)

HAZARDOUS WASTE
WW-5257580999-001-01-0

STORAGE LABEL

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

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

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

DATE ACCUMULATED: 07/01/2005

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.

27. 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.

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 (20230113)

28. Fence Safety, Item 616.0700.S.

A Description

This special provision describes providing plastic fence at locations the plans show.

B Materials

Furnish notched conventional metal "T" or "U" shaped fence posts.

Color:	International orange (UV stabilized)
Roll Height:	4 feet
Mesh Opening:	1 inch min to 3 inch max
Resin/Construction:	High density polyethylene mesh
Tensile Yield:	Avg. 2000 lb per 4 ft. width (ASTM D638)
Ultimate Tensile Strength:	Avg. 3000 lb per 4 ft. width (ASTM D638)
Elongation at Break (%):	Greater than 100% (ASTM D638)
Chemical Resistance:	Inert to most chemicals and acids

C Construction

Drive posts into the ground 12 to 18 inches. Space posts at 7 feet.

Use a minimum of three wire ties to secure the fence at each post. Weave tension wire through the top row of strands to provide a top stringer that prevents sagging.

Overlap two rolls at a post and secure with wire ties.

D Measurement

The department will measure Fence Safety by the linear foot along the base of the fence, center-to-center of posts, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
616.0700.S	Fence Safety	LF

Payment is full compensation for furnishing and installing fence and posts; maintaining the fence and posts in satisfactory condition; and for removing and disposing of fence and posts at project completion.

stp-616-030 (20160607)

29. Nighttime Work Lighting-Stationary.

A Description

This special provision describes furnishing portable lighting as necessary to complete nighttime work. Nighttime operations consist of work specifically scheduled to occur after sunset and before sunrise.

B (Vacant)

C Construction

C.1 General

This provision shall apply when providing, maintaining, moving, and removing portable light towers and equipment-mounted lighting fixtures for nighttime stationary work operations, for the duration of nighttime work on the contract.

At least 14 days before the nighttime work, furnish a lighting plan to the engineer for review and acceptance. Address the following in the plan:

1. Layout, including location of portable lighting – lateral placement, height, and spacing. Clearly show on the layout the location of all lights necessary for every aspect of work to be done at night.
2. Specifications, brochures, and technical data of all lighting equipment to be used.
3. The details on how the luminaires will be attached.
4. Electrical power source information.
5. Details on the louvers, shields, or methods to be employed to reduce glare.
6. Lighting calculations. Provide illumination with average to minimum uniformity ratio of 5:1 or less throughout the work area.
7. Detail information on any other auxiliary equipment.

C.2 Portable Lighting

Provide portable lighting that is sturdy and free standing and does not require any guy wires, braces, or any other attachments. Furnish portable lighting capable of being moved as necessary to keep up with the construction project. Position the portable lighting and trailers to minimize the risk of being impacted by traffic on the roadway or by construction traffic or equipment. Provide lightning protection for the portable lighting. Portable lighting shall withstand up to 60 mph wind velocity.

If portable generators are used as a power source, furnish adequate power to operate all required lighting equipment without any interruption during the nighttime work. Provide wiring that is weatherproof and installed according to local, state, federal (NECA and OSHA) requirements. Equip all power sources with a ground-fault circuit interrupter to prevent electrical shock.

C.3 Light Level and Uniformity

Position (spacing and mounting height) the luminaires to provide illumination with an average to minimum uniformity ratio of 5:1 or less throughout the work area.

Illuminate the area as necessary to incorporate construction vehicles, equipment, and personnel activities.

C.4 Glare Control

Design, install, and operate all lighting supplied under these specifications to minimize or avoid glare that interferes with all traffic on the roadway or that causes annoyance or discomfort for properties adjoining the roadway. Locate, aim, and adjust the luminaires to provide the adequate level of illumination and the specified uniformity in the work area without the creation of objectionable glare.

Provide louvers, shields, or visors, as needed, to reduce any objectionable levels of glare. As a minimum, ensure the following requirements are met to avoid objectionable glare on the roadways open to traffic in either direction or for adjoining properties:

1. Aim tower-mounted luminaires, either parallel or perpendicular to the roadway, so as to minimize light aimed toward approaching traffic.
2. Aim all luminaires such that the center of beam axis is no greater than 60 degrees above vertical (straight down).

If lighting does not meet above-mentioned criteria, adjust the lighting within 24 hours.

C.5 Continuous Operation

Provide and have available sufficient fuel, spare lamps, generators, and qualified personnel to ensure that the lights will operate continuously during nighttime operation. In the event of any failure of the lighting system, discontinue the operation until the adequate level of illumination is restored. Move and remove lighting as necessary.

D (Vacant)

E Payment

Costs for furnishing a lighting plan, and for providing, maintaining, moving, and removing portable lighting, tower mounted lighting, and equipment-mounted lighting required under this special provision are incidental to the contract.

stp-643-010 (20100709)

30. Construction Staking Electrical Installations (Project), Item 650.8501.

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 pull boxes / vaults are both stationed to the center with the conduit stationed at the ends. See drawing details for any additional information.

31. Lamp, Ballast, LED, Switch Disposal by Contractor, Item 659.5000.S.

A Description

This special provision describes the detachment and packaging of lamps, ballasts, LEDs, and mercury containing switches (e.g., overhead roadway lighting, underdeck bridge, wall packs, pedestrian signals, traffic control stop lights and warning flashers, fluorescent bulbs, and thermostats) removed under this contract for disposal as hazardous materials.

For Lamp, Ballast, LED, Switch Disposal by Contractor, coordinate removal from the work site by the department's hazardous waste disposal vendor. Disposal will be billed to the department by the hazardous waste disposal vendor.

For Lamp, Ballast, LED, Switch Disposal by department, coordinate removal from the work site and delivery to the designated location for disposal by the department.

B Materials

B.1 Disposal by Contractor

Items removed under this contract will be considered the property of the department for waste generator identification. The contractor is responsible for coordinating with the department's hazardous waste vendor for disposal:

<https://wisconsin.gov/Documents/doing-bus/eng-consultants/cnslt-rsrcs/environment/hazwaste-contacts.pdf>

C Construction

C.1 Removal

Arrange for the de-energizing of luminaires after receiving approval from the engineer that the existing luminaires can be removed. Do not remove luminaires that cannot be replaced with proposed LED units and operational within the same workday. The new LED units need to be operational prior to sunset of the same workday.

Detach and remove luminaires and lamps from the existing traffic signal poles or respective structure. Avoid breaking fixtures whenever possible.

Lamps, ballasts, LED, and switches will become property of the department, and will be disposed of in an environmentally sound manner.

C.2 Packaging of Hazardous Materials

Provide a secure, level location removed from the travelled way for storage of the material for disposal.

Pack intact fixtures in the packaging of the new lamps used to replace them, or packaging affording the equivalent protection. Place in full, closed stackable cartons.

Pile cartons no more than four high if palletized and secure cartons with shrink wrap to prevent shifting or falling of the loads. Clearly mark each pallet with the words "Universal Waste Lamps" or "Universal Waste Ballasts", the date, and the number of fixtures on each pallet.

Pack broken fixtures into (min.) 6 mil thick plastic bags and place inside sturdy cardboard boxes or the equivalent. Mark the outer packaging with the term "Broken Fixtures/Lamps", the date and the number of broken fixtures clearly marked on the box.

The hazardous waste vendor will not accept fixtures improperly packaged. The vendor will reject any fixtures not removed as part of a contract pay item or otherwise required under this contract.

Pack ballasts and mercury containing switches in appropriate containers.

C.3 Disposal by Contractor

Complete the lamp and ballast inventory (<https://wisconsin.gov/Documents/doing-bus/eng-consultants/cnslt-rsrcs/environment/dotlampballastinventory.dotx>) and contact the hazardous waste vendor to coordinate pickup and disposal at a location specified by the contractor. Consolidate all pallets and boxes from one project at a single location. Contact the hazardous waste vendor to set up an appointment for pickup. The hazardous waste vendor requires a minimum of one week advance notice to schedule pickup.

D Measurement

The department will measure Lamp, Ballast, LED, Switch Disposal by Contractor as each individual unit removed and received by the hazardous waste vendor, properly packaged and acceptably completed, matching the total number of units provided on the inventory form. The department will not measure broken fixtures that exceed a total of 10 percent of all fixtures to be disposed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
659.5000.S	Lamp, Ballast, LED, Switch Disposal by Contractor	EACH

Payment is full compensation for detachment, handling, packaging, labeling and scheduling disposal with the hazardous waste vendor; and scrapping and disposal of all other materials.

32. Concrete Removal and Replacement at Machinery Floor, Item SPV.0025.001.

A Description

This special provision describes removing and replacing portions of the concrete floor on the machinery level of the bascule piers; partial removal of steel members that are entirely or partially encased in the concrete floor; repairing steel members; and providing a concrete base for machinery supports as the plans show conforming to standard spec 203, 502, 506, 509 and as hereinafter provided.

B Materials

Furnish Grade A concrete conforming to standard spec 501 and standard spec 502.

Use epoxy coated steel reinforcement conforming to standard spec 505 and as shown on the plans.

C Construction

C.1 Concrete Removal

Remove concrete to the depth and horizontal limits shown on the plans.

Make a 1/2-inch-deep saw cut at the limits of concrete removal before removing the concrete. Use removal equipment that causes no damage to the portion of the concrete floor and steel members remaining in place.

Remove all concrete from surfaces of structural steel members that are to remain to the extent that subsequent cleaning operations will remove any concrete residue. For portions of concrete anchored by material welded to structural steel, grind the welds flush with the steel surface.

Dispose of old concrete, steel and debris removed away from the bridge site.

Clean all unpainted steel surfaces that are exposed by the removal of concrete and apply a coat of zinc rich primer to the cleaned steel surfaces.

C.2 Steel Removal

Remove exposed machinery support steel framing to the limits shown on the plans.

Neatly cut the steel framing without weakening or damaging the portions of the steel to remain.

Cut re-entrant cuts to a radius of not less than 1 inch.

Grind smooth cut edges of the remaining steel framing that will remain exposed and not be covered by new concrete.

C.3 Placing Concrete

Clean the surfaces receiving new concrete by brooming and using water pressure to remove particles and dust and keep continuously wet for two hours before placing concrete. Immediately before placing concrete, coat the entire surface receiving the new concrete with neat cement as specified in standard spec 509.2.

C.4 Temporary Shoring

Provide temporary shoring of "Bent B" and "Bent C" of each bascule leaf during removal and replacement of the concrete pedestals beneath the baseplates of their supporting columns.

D Measurement

The department will measure Concrete Removal and Replacement at Machinery Floor by the cubic foot of concrete placed, acceptably completed. Only the volume of new concrete will be measured for payment.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0025.001	Concrete Removal and Replacement at Machinery Floor	CF

Payment is full compensation for concrete removal; for furnishing and placing new concrete; for cutting and removing steel members that are entirely or partially encased in concrete; and to provide temporary shoring of the columns of "Bent B" and "Bent C" of each bascule leaf during replacement of the concrete pedestals beneath the baseplates of their supporting columns.

33. Counterweight Concrete Modification, Item SPV.0025.002.

A Description

This special provision describes placing concrete into areas of the counterweight of each bascule leaf that have been previously removed to restore the counterweight pockets to their original detailed shape; forming and casting concrete balance blocks to the counterweight as required conforming to sections 502 and 506 as modified in this special provision.

B Materials

Furnish Grade A concrete conforming to standard spec 501 and standard spec 502.

Use epoxy coated reinforcement conforming to standard spec 506.

To obtain a close estimate of the average unit weight of the concrete that will be added to the counterweights for use in span balance calculations, make a trial batch and cast 10 unit weight test blocks from it. Cast unit weight test blocks that measure at least 8" x 8" x 12" and all having the exact same size. Use forms for the test blocks that are rigid and impervious. Provide concrete for the test blocks that contains the same materials and air content as that of the proposed mix design for the concrete to be used in the counterweight repair. After the concrete is poured into the test block forms, vibrate it to the same extent that the counterweight concrete will be vibrated in the counterweight. After vibrating, strike off the tops prior to initial set. Cure the test blocks in their forms for two days with the tops uncovered. During this time, store the blocks under shelter in the open air. After two days, remove the forms and weigh the blocks. Use a scale having an accuracy of 0.01 pound to weigh the blocks. Accurately measure all 3 dimensions and record the weights of the individual blocks, the calculated unit weight of the individual blocks, and the calculated average unit weight of the set of blocks to the nearest 0.01 pounds per cubic foot. Calibrate the scale by weighing a reference object prior to weighing the test blocks. Use the average unit weight obtained from the test blocks in the span balance computations.

C Construction

Place all new concrete and reinforcement steel according to the details and dimensions shown on the counterweight repair plans.

Blast clean exposed reinforcement that will remain and apply zinc-rich paint to their cleaned surfaces. Install anchors and additional epoxy coated reinforcement for the areas of added concrete as shown on the plans. Remove all unsound concrete from counterweight surfaces against which new concrete is to be placed.

For use in preparing counterweight calculations, prior to pouring counterweight concrete obtain concrete unit weight measurements from trial batches for the proposed concrete mix.

Immediately prior to the placement of new material, air-clean and thoroughly wet all receiving surfaces and apply epoxy-bonding agent to the surfaces. Do not place any material if the ambient air, or the concrete surface temperature, is at or below 45° F.

D Measurement

The department will measure Counterweight Concrete Modification by the cubic foot of concrete placed based on approved dimensions for added poured concrete, 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. 0025.02	Counterweight Concrete Modification	CF

Payment is full compensation for forming, furnishing; and placing and curing concrete and concrete balance blocks for the counterweights.

The department will pay separately for furnishing and installing adhesive anchors and reinforcing steel where new concrete will be placed, placing steel balance plates into counterweight pockets, and preparing span balance calculations.

34. Waterline Concrete Surface Repair, Item SPV.0025.003.

A Description

This special provision describes performing concrete surface repairs at, or below, the waterline conforming to standard spec 502 and 509 and as hereinafter provided.

B Materials

Use epoxy coated steel reinforcement conforming to standard spec 505 and as shown on the plans.

Provide masonry anchors according to standard spec 502.

C Construction

Remove all concrete to the horizontal and vertical limits the plans show, and the engineer directs. Make a 1/2-inch-deep saw cut at the limits of the surface repair before removal of the deteriorated concrete. Remove concrete to sound concrete or to 1-inch behind the existing reinforcing steel, whichever is deeper.

Provide a watertight working enclosure and dewater the enclosure before removal of the deteriorated concrete.

Take necessary precautions while removing deteriorated concrete to preserve existing reinforcing steel.

Blast clean, realign, and retie existing reinforcing steel to be re-used, as the engineer considers necessary and apply a zinc-rich primer.

D Measurement

The department will measure Waterline Concrete Surface Repair by the cubic foot of replacement concrete that is provided and placed based on the horizontal and vertical limits shown and the actual average depth of removal and placement. Only new concrete will be measured for payment.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0025.003	Waterline Concrete Surface Repair	CF

Payment is full compensation for furnishing and placement of reinforcement and masonry anchors will be paid for separately.

The department will pay separately for removal and replacement of unsound concrete beyond the limits shown on the plans for this bid item.

35. Bascule Girder Stiffener Angle Repairs, Item SPV.0060.001.

A Description

This special provision describes removing and replacing deteriorated lower portions of steel stiffener angles attached to the webs of the front arms of the bascule girders as shown on the plans and specified herein.

B Materials

Furnish steel angles, plates and connection hardware conforming to standard spec 506. Use high strength structural steel conforming to ASTM A 709, grade 50. Fabricate replacement sections of steel angles and fill plates as shown on the plans. After complete fabrication, zinc-coat the new sections according to ASTM A123. Blast clean steel to a condition of SSPC-SP 6 before applying zinc coating.

C Construction

Perform this work according to the applicable provision of standard spec 506.

Neatly remove deteriorated portions of stiffeners by flame-cutting or sawing. Grind smooth any rough and non-straight edges created by the removal process. Remove rivets attaching bascule girder web and lower flange angle to portions of stiffeners to be replaced.

Dispose of removed steel.

Attach replacement elements as shown on the plans by bolting and by welding as shown in the plans with an AWS certified welder. Provide documentation of welder certification.

Clean areas of galvanized coating damaged by welding to bare metal and apply touchup galvanizing repair coating.

After completion of repairs, paint replacement steel elements according to and as part of the bridge repainting work.

After completion of repairs, paint replacement steel elements according to and as part of the bridge repainting work.

D Measurement

The department will measure Bascule Girder Stiffener Angle Repairs by each individual stiffener angle, acceptably completed.

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.0060.001	Bascule Girder Stiffener Angle Repairs	EACH

Payment is full compensation removing deteriorated portions of steel angles including their connecting rivets; furnishing and installing replacement elements including connecting bolt, welds and fill plates; and for removing and disposing of the existing deteriorated steel as shown on the plans.

The department will pay separately for painting of the replacement steel elements as part of the pay item Structure Repainting Recycled Abrasive.

36. Loading Girder Base Repairs, Item SPV.0060.002.

A Description

This special provision describes removing deteriorated portions of outstanding legs of loading girder steel stiffening angles at their interface with the concrete machinery floor within the bascule piers and furnishing and installing replacement repair plates as shown on the plans.

B Materials

Furnish steel plates conforming to standard spec 506. Use high strength structural steel conforming to ASTM A 709, grade 50. Zinc-coat the new steel plates according to ASTM A123. Blast clean steel to a condition of SSPC-SP 6 before applying zinc coating.

C Construction

Perform this work according to standard spec 506 and as shown on the plans.

Dispose of removed steel.

Attach new sections of plate as shown on the plans by welding with an AWS certified welder. Provide documentation of welder certification. Clean areas of galvanized coating damaged by welding to bare metal and apply touchup galvanizing repair coating.

Remove any corroded metal from surrounding metal of girder areas to be repaired and abrasive blast or power tool clean to bare metal prior to welding new repair plates.

After completion of repairs, paint replacement steel elements according to and as part of the bridge re-painting work.

D Measurement

The department will measure Loading Girder Base Repairs as one each per bascule pier which includes all individual single angles that are repaired within the bascule pier, acceptably completed.

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. 0060.002	Loading Girder Base Repairs	EACH

Payment is full compensation for removing the deteriorated steel; furnishing and erecting of new steel plates; and for removing and disposing of the existing deteriorated steel and to furnish and weld the new plates as described above and as shown on the plans.

The department will pay separately for removal of surrounding concrete to enable performance of this work the pay item Concrete Removal and Replacement at Machinery Floor.

The department will pay separately for painting of the replacement steel elements as part of the pay item Structure Repainting Recycled Abrasive.

37. Bascule Girder Trunnion Web Stiffener Replacements, Item SPV.0060.003.

A Description

This special provision describes removing and replacing deteriorated and pack-rusted steel stiffener angles and fill plates attached to the portion of the bascule girder web surrounding the trunnion shaft as shown on the plans and specified herein.

B Materials

Conform to standard spec 506. Use high strength structural steel conforming to ASTM A709, grade 50. Furnish and fabricate replacement sections of steel angles, fill plates and high strength structural bolts as shown on the plans. After complete fabrication, zinc-coat the new sections according to ASTM A123. Blast clean steel to a condition of SSPC-SP 6 prior to applying zinc coating.

Furnish high-strength bolts and hardware conforming to standard spec 506.2.5. Use bolts with a diameter no smaller than the rivets they replace.

C Construction

Perform all work according to standard spec 506 and hereinafter provided. Remove rivets attaching stiffeners to the girder webs.

Attach new steel angles with high strength bolts using existing girder web holes from removed rivets. Ensure holes in replacement elements correspond to location of existing rivet holes by field verifying dimensions shown on plans.

Remove only one set of four stiffener angles at a time and replace the set before removing another.

Dispose of removed steel.

After completion of repairs, paint replacement steel elements according to the bridge repainting work.

D Measurement

The department will measure Bascule Girder Trunnion Web Stiffener Replacements by each set of four stiffener angles removed and replaced, acceptably completed. One set consists of two pairs of angles. One pair is on each side of the bascule girder web, with common connectors between them.

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. 0060.003	Bascule Girder Trunnion Web Stiffener Replacements	EACH

Payment is full compensation removing existing angles, fill plates and connecting rivets; furnishing and installing new steel and connection bolts; and for removing and disposing of the existing deteriorated steel.

The department will pay separately for painting of the replacement steel elements as part of the pay item Structure Repainting Recycled Abrasive.

38. Uplift Column Base Repairs, Item SPV.0060.004.

A Description

This special provision describes removing deteriorated portions of uplift columns and associated diagonal braces at their interface with the concrete floor in the machinery room and counterweight areas of the bascule piers and furnishing and installing replacement portions as shown on the plans.

B Materials

Furnish steel plates conforming to standard spec 506. Use high strength structural steel conforming to ASTM A709, grade 50. Zinc-coat the new repair plates, according to ASTM A123. Blast clean steel according to SSPC-SP 6 before applying zinc coating.

C Construction

Perform this work according to standard spec 506 and as shown on the plans and directed by the engineer.

For each repair location provide repair plates on the outside faces of column or diagonal flanges and on the web faces of same members.

Attach new sections of plate by welding with an AWS certified welders. Provide documentation of welder certification. Clean areas of galvanized coating damaged by welding to bare metal and apply touchup galvanizing repair coating.

Remove any corroded metal from surrounding metal of columns and diagonals to be repaired. Abrasive blast or power tool clean the areas to bare metal prior to welding new repair plates.

Dispose of removed steel.

After completion of repairs, paint replacement steel elements according to the bridge repainting work.

D Measurement

The department will measure Uplift Column Base Repairs by each individual column base or diagonal member that is repaired, acceptably completed.

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. 0060.004	Uplift Column Base Repairs	EACH

Payment is full compensation removing the deteriorated steel; furnishing and erecting of new steel plates; and for removing and disposing of the existing deteriorated steel and to furnish and weld the new plates as described above and as shown on the plans.

The department will pay separately for removal of surrounding concrete to enable performance under the pay item Concrete Removal and Replacement at Machinery Floor.

The department will pay separately for painting of the replacement steel elements as part of the pay item Structure Repainting Recycled Abrasive.

39. Stiffener Replacements at Pinion Bearing Support, Item SPV.0060.005.

A Description

This special provision describes removing pairs of deteriorated steel stiffener angles – one on each side of the web of the vertical structural member supporting pinion bearings with common riveted connections and replacing them with a new pair of angles and bolted connections as shown on the plans.

B Materials

Conform to standard spec 506. Furnish and fabricate replacement sections of steel angles and high strength structural bolts as shown on the plans. After fabrication, zinc-coat the new steel angles according to ASTM A123. Blast clean steel to a condition of SSPC-SP 6 before applying zinc coating. Provide new angles of the same size as those removed. Use high strength structural steel conforming to ASTM A709, grade 50.

Provide galvanized high strength bolts conforming to ASTM A325, nuts conforming to ASTM A563 and flat washers. Provide connection hardware that conforms to all applicable provisions of standard spec 506.2.5. Provide replacement bolts with a diameter no smaller than the rivets they replace.

C Construction

Perform all work according to standard spec 506 and hereinafter provided. Remove rivets attaching the stiffener angles to the web of the vertical structural member supporting the pinion bearings.

Dispose of removed steel.

Attach new steel angles with high strength bolts using existing girder web holes from removed rivets. Ensure holes in replacement elements correspond to location of existing rivet holes by field verifying dimensions.

After completion of repairs, paint replacement steel elements according to the bridge repainting work.

D Measurement

The department will measure Stiffener Replacements at Pinion Bearing Support by each set of two stiffener angles removed and replaced, acceptably completed.

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. 0060.005	Stiffener Replacements at Pinion Bearing Support	EACH

Payment is full compensation for removing the common rivets supporting each pair of deteriorated stiffener angles, removing, and disposing of the old angles, and furnishing and installing new angles and connecting bolts.

The department will pay separately for painting of the replacement steel elements as part of the pay item Structure Repainting Recycled Abrasive.

40. Ladder and Railing Repairs, Item SPV.0060.006.

A Description

This special provision describes removing and replacing deteriorated bottom portions of service railing posts within the bascule piers and repairing the ladder in each bascule pier providing access to the counterweight pit by removing the deteriorated upper and lower portions of each and providing and attaching new replacement sections as shown on the plans.

B Materials

Conform to standard spec 506. Fabricate replacement sections of posts and steel ladder sections using structural steel plate, shapes, and 2-inch diameter pipe as shown on the plans. After complete fabrication, zinc-coat the replacement sections, according to ASTM A123. Blast clean steel according to SSPC-SP 6 before applying zinc coating.

C Construction

Neatly remove the deteriorated lower portions of railing posts and ladders by flame-cutting or sawing. Grind smooth any rough and non-straight edges created by the removal process.

Remove the portion of existing anchorages extending above the concrete surface. Cut existing anchors 2-inches beneath the concrete surface and patch with repair mortar.

Attach new sections to remaining existing portions as shown on the plans by welding with an AWS certified welder. Provide documentation of welder certification. Clean areas of galvanized coating damaged by welding to bare metal and apply touchup galvanizing repair coating.

Remove any corroded metal from surrounding metal of columns to be repaired and abrasive blast or power tool clean to bare metal prior to welding new repair plates.

Attach the base plates of the new lower portions of railing, and the new upper portions of the ladder to existing concrete using 3/4" diameter adhesive anchors. Locate holes for anchors in new base plates and angles such that installation of them will not conflict with remaining portion of old anchors.

After completion of repairs, paint entire rail and ladder elements according to the bridge repainting work.

D Measurement

The department will measure Ladder and Railing Repairs by each set consisting of all railing bases and both upper and lower portions of ladder repaired within each bascule pier, acceptably completed. For each bascule pier location, a "set" has been estimated as one ladder repaired at the upper and lower ends of the ladder, and four railing bases.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0060.006	Ladder and Railing Repairs	EACH

Payment is full compensation for providing, fabricating, zinc coating, transporting and installing railing post replacement sections and steel ladder sections; for removing deteriorated existing portions of posts and ladder portions and their concrete anchorages.

The department will pay separately for furnishing and installing new 3/4-inch adhesive anchors under the separate pay item Adhesive Anchor 3/4-Inch.

The department will pay separately for painting of the replacement steel elements as part of the pay item Structure Repainting Recycled Abrasive.

41. Rivet Removal and Replacement, Item SPV.0060.007.

A Description

This special provision describes removing deteriorated rivets and furnishing and installing replacement high strength steel bolts at locations determined by the engineer where existing rivets are heavily deteriorated and are not required to be removed as part of replacing structural members, plates and other steel elements of the bridge.

B Materials

Furnish high-strength bolts and hardware conforming to standard spec 506.2.5. Use bolts with a diameter no smaller than the rivets they replace.

All bolts forward of the main drive pinions and on the outboard side of the bascule girders shall be button head style to replicate the look of the removed rivets. These shall also be galvanized and conform to ASTM A325. Orient bolts with the button heads on the prominently visible side. Bolts behind the vertical planes of the main drive pinions need not be button head style.

C Construction

Ensure connected metal elements are not damaged by rivet removal operations. Install replacement bolts conforming to standard spec 506.3.

D Measurement

The department will measure Rivet Removal and Replacement by each rivet removed and replaced by a bolt where not required as part of replacing structural members, plates, and other steel elements of the bridge, acceptably completed. An estimated quantity of 500 rivets has been included for this item for the bidding purposes.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0060.007	Rivet Removal and Replacement	EACH

Payment is full compensation for removing rivets where shown on the plans and replacing them with bolts at locations directed by the engineer; including furnishing of the replacement bolts, nuts and washers.

Rivets removed and replaced as part of replacing structural members, plates, and other steel elements of the bridge will be paid for separately under other bid items.

42. Heel Block Refurbishment, Item SPV.0060.008.

A Description

This article covers all apparatus, material and labor required to properly detail, furnish, manufacture, ship, install, adjust, test, paint and put into approved working order all parts of the specified bascule girder heel block systems.

The components to be removed includes the following:

- Fabric pads, wood blocks, steel angles, and support plates.
- All associated hardware.

The new Heel Block components to be furnished and installed includes the following:

- Two strike weldments per bascule leaf (four total)
- Two support plates per bascule leaf (four total)
- Two heel shoes per bascule leaf (four total)
- All associated shims and hardware required for a complete system

The contract documents are diagrammatic in showing certain physical relationships which must be arranged within the mechanical work. Coordinate mechanical work with structural work as well as bridge closures and restrictions to vehicular and navigational traffic. Schedule and arrange mechanical work in a neat, well-organized manner.

B Materials

Materials used to fabricate the new heel block components shall be as shown on the plans and according to the requirements specified in Bridge Machinery – General provisions. Galvanize and paint steel components.

C Construction

C.1 General

Remove existing heel block assemblies in a manner not to damage existing bridge components.

Standard spec 506.3 applies to this item. Construct according to the requirements defined herein, and in the plans and the provisions of the AASHTO Movable Specifications. Where a conflict exists between documents, the requirements of the plans and specifications will govern over those of the AASHTO Movable Specifications.

C.2 Setting of Heel Blocks

Ensure mating surfaces of both heel blocks are in even full bearing when the final-adjusted bascule span is in the fully closed position.

C.6 Erection

Erect and assemble heel blocks according to part numbers and match marks. Adjust all parts for precise alignment by means of shims and pull parts tightly against supporting members by use of clamps, temporary bolts, or other approved means before drilling and reaming holes for connecting bolts.

Perform final shimming of the heel block assemblies before final shimming of the center locks.

C.7 Protection for Shipment

Coat all finished metal surfaces as soon as practical, after machining, with an approved rust-inhibiting compound. Completely protect parts from weather, dirt and foreign materials during manufacture and store indoors while awaiting erection. Assembled units having finished mounting surfaces shall have those surfaces thoroughly coated with rust-inhibitor and shall be skidded or crated for protection during handling, shipment and storage. Bag mounting hardware and other small parts for shipment. Provide and secure tags, recording the part number, to each part with wire or plastic ties prior to shipment.

D Measurement

The department will measure Heel Block Refurbishment 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.0060.008	Heel Block Refurbishment	EACH

Payment is full compensation for furnishing and install the heel block refurbishment.

43. Machinery Enclosures, Item SPV.0060.009.

A Description

This special provision describes fabricating and installing a new machinery enclosure system along the front face of the bascule pier. The enclosure system is comprised of polycarbonate structural sheeting on steel framing and flanking end sections comprised of galvanized steel plate sections. Also included are closure plates and connecting material between the ends of the overhead bridge deck supporting beams. The enclosure system for each pier includes a section comprised of polycarbonate sheeting on steel framing.

B Materials

B.1 Structural Supporting Framing Members

Provide galvanized structural steel framing to support the wall panels of the enclosure system as shown on the plans. Provide galvanized A-325 bolts for connecting framing members to one another. Paint the structural framing members using the same paint system as that for the new bascule superstructure steel.

Provide epoxied anchor bolts for attaching supporting steel framing elements of the enclosure system to the curb.

B.2 Steel Enclosure Plate

Provide steel plate for that designated portion of the enclosure shown in the plans. Provide plate of the thickness shown on the plans. Use high strength structural steel conforming to ASTM A709, grade 36 or higher.

Hot-dip galvanize all steel enclosure plate. Brush blast the galvanized surfaces and provide the same intermediate and top coat of paint to steel enclosure plate using the same paint system as that for other new steel furnished for the bridge.

B.3 Polycarbonate Structural Sheeting

Provide polycarbonate sheeting for that designated portion of the enclosure shown in the plans.

Provide shatter resistant, extruded polycarbonate cellular sheet with minimum thickness of 5/8 inch for that portion of the enclosure shown in the plans. Provide sheet with UV- stabilized co-extruded outer layer and triple wall configuration with x-brace inner structure. Provide base material mass approximately 0.737 lb. per square foot. Provide sheeting with a clear color. Provide PolyCarb 16RDC as manufactured by

Gallina, USA, Polygal Titan as manufactured by Polygal Plastics Industries, Lexan Thermoclear as manufactured by General Electric Co., or an approved equal.

Provide sheeting classified as CC-1 for extent of burning per ASTM D-635 and having a smoke density rating no greater than 450 when tested according to ASTM E-84.

Provide sheeting having a light transmission rating of approximately 80 percent.

Provide extruded profiles and trim as recommended by the manufacturer to seal, make weather-tight and neatly finish all edges and joints between pieces.

Provide neoprene sealing washers having the following properties:

- Min. tensile strength of 2500 psi
- Elongation at rupture min. 350%
- Max. compression 35%
- Tear resistance min. 214 N/cm

B.4 Caulk

Furnish and install caulking at all locations where necessary to ensure a weather-tight system and as directed by the engineer.

Furnish and install exterior caulk that is one part polyurethane sealant meeting the requirements of ASTM C920, (Type M, Grade NS, Class 25 Type 2 Class A). Provide exterior caulking of color approved by the engineer to match or complement colors of materials on either side of the joint. Provide non staining sealant backer rods and/or bond breakers, as recommended by the sealant manufacturer, which are compatible with joint substrates, sealant, primers, and other joint fillers.

C Construction

C.1 Field Measurements and Coordination with other Bridge Elements

The general layout and arrangement of the enclosure system is shown in the plans. The limits and dimensions for its various components shown are approximate, based on original bridge design plans and subject to variation. Before fabricating any elements of the enclosure system, obtain field measurements of all actual existing surrounding structural, mechanical and electrical elements to be accommodated by the enclosure system. Coordinate layout of enclosure system components with details and dimensions of existing operating machinery components to remain and new components to be provided.

C.2 Polycarbonate Structural Sheeting

Install polycarbonate sheeting in front of the machinery over the extent shown on the Plans. Attach the polycarbonate sheeting to the structural steel enclosure framing with 1/4-inch stainless steel bolts. Include locking nuts, double washers, and a sealing washer on each bolt. Install bolts with the heads at the outside face of the enclosure. Splice panels as per manufacturer's requirements. Fasten splices at 1 foot maximum centers. Cap exposed points of fasteners with plastic protectors.

Install the flashing as required at the top and bottom of the removable panels. Attach the stainless steel flashing as shown on the Plans with 1/4-inch stainless steel bolts and nuts with double washers placed at 1-foot maximum centers.

Submit to the engineer for review and approval complete construction drawings, shop details, installation drawings, catalog data, manufacturer's literature, etc. Complete submittals required include, but are not limited to, polycarbonate sheeting, flashing, hardware, steel framing, and other pertinent items.

Neatly finish installation of polycarbonate sheeting and metal work. Correct any defective work to the satisfaction of the engineer at no additional expense to the state.

D Measurement

The department will measure Machinery Enclosures as a single complete unit for each of the two bascule piers, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0060.009	Machinery Enclosures	EACH

Payment is full compensation for furnishing and installing all materials and manufactured products as shown on the plans for complete enclosure systems, including furnishing the sliding door system.

The department will pay separately for applying of paint over galvanized enclosure steel under the item for painting of new steel Painting Epoxy System.

44. Access Hatch, Item SPV.0060.010.

A Description

This special provision describes furnishing and installing a factory manufactured entry hatch system in each sidewalk of the east bascule leaf to provide access to the centerlock machinery below and access hatch in each pier at machinery level floor to access the pit. This work also includes providing and installing EMSEAL joint material around the perimeter of the exterior of the frame.

B Materials

Provide an access hatch system with the dimensions shown on the plans and meeting the following requirements:

- A system constructed with a channel frame for use in exterior applications that is resistant to water entering the access opening.
- A channel frame made of extruded aluminum with ability to be bolted to steel support framing around the perimeter.
- A channel frame with a 1-1/2" drain coupling located in one corner.
- A cover that is single-pivoting.
- A cover comprised of 1/4-inch thick aluminum having a raised diamond pattern for slip resistance
- A cover capable of supporting an AASHTO H-20 wheel load with a maximum deflection of 1/150th of its span
- A system that is pre-assembled from the manufacturer.
- A cover whose operation is smooth and easy with controlled operation throughout the entire arc of opening and closing.
- A cover whose operation is not affected by temperature.
- An entire system, including all hardware components, that is highly corrosion resistant. Hardware that is Type 316 stainless steel throughout.
- Hinges specifically designed for horizontal installation and through-bolted to the cover with tamperproof Type 316 stainless steel lock bolts and through-bolted to the frame with Type 316 stainless steel bolts and locknuts.
- Lifting mechanisms with the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed 1/4" gusset support plate. Springs and spring tubes shall be Type 316 stainless steel.
- A cover that firmly locks down when closed and does not vibrate when vehicles cross the bridge.
- A removable exterior turn/lift handle with a spring loaded ball detent to open the cover with a latch release protected by a flush, gasketed, removable screw plug.
- A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
- Hinges that are heavy forged Type 316 stainless steel, having a minimum 1/4" diameter Type 316 stainless steel pin, that pivot so the cover does not protrude into the channel frame.

- A cover equipped with a hold open arm which automatically locks the cover in the open position.
- A factory finish that is mill finish aluminum with bituminous coating applied to the exterior of the frame.

In addition to the commercially manufactured hatch system, provide and install EMSEAL joint material around the perimeter of the exterior of the frame between it and the rough opening in the sidewalk to provide protection to cut edges of the fiberglass sidewalk plates. The rectangular collar shall have beveled edges, be of welded construction with mitered corners and be secured down through the top of the walking surface with countersunk head stainless steel machine screws.

C Construction

Install the access hatch system per the manufacturer’s specifications. Provide a copy of the manufacturer’s specifications to the engineer 14 days prior to installation of the hatch system.

Deliver and store hatch systems in manufacture’s original packaging until ready to install.

Use an installer having a minimum of 2 years’ experience installing similar products.

Install system in strict accordance with manufacturer’s instructions and approved submittals. Locate the units level, plumb, and in proper alignment with adjacent work. Test units for proper function and adjust until proper operation is achieved. Repair any of the surface finish damaged during installation.

D Measurement

The department will measure Access Hatch as each individual completed 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.0060.010	Access Hatch	EACH

Payment is full compensation for furnishing and installing a complete access hatch system including EMSEAL joint material around the hatch in each sidewalk and in each pier and for furnishing all necessary connections to the surrounding structural framing members of the sidewalk and pier floor at machinery level.

45. Architectural Exterior Bridge LED Lighting SPV.0060.011.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for furnishing and installing an LED lighting system on the exterior of the Cherry St. Bridge Structure as described herein, as shown on the plans, and as directed by the engineer.

This item must include all LED luminaires, lighting controls, steel supports, mounting brackets and hardware, power and data wires, conduits, pull boxes and all appurtenances for a fully functional lighting system as specified herein and as shown on contract drawings.

For each leaf of the bridge, provide one 365-Day Astronomic Time Switch each with a minimum of four control circuits (relays) for light control at each end of the bridge. Light control switch shall be as manufactured by Intermatic, Model ET90000 Series or approved equal. Each astronomic time clock shall be installed inside a NEMA-4X, 316 Stainless Steel enclosure with an enclosure manufacturer back plate, 50W self-controlled heater element, terminal blocks, fuses and all the ancillary required hardware and mounting support for a complete installation.

A.1 Related Provisions

Unless otherwise noted, work under this special provision must conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry Street
- PLC Controls – Cherry Street

- PLC and Communication Modifications – Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable

B Materials

B.1 Socket String cord with LED Fixtures

Furnish light fixtures manufactured by Ericson (4323 Hamann Parkway) Willoughby OH 44094 or approved equal.

Socket String cord light shall be of the custom made industrial grade heavy duty stringlight, 15-Amps, 125V, 1875 Watt rated, of the length required to cover each leaf (double side) of the Cherry St spans.

The conductor shall be a 12 AWG/3-wires SOOW, black insulation, with a size as required blunt primary end (no plug) heavy duty over molded black medium base crush proof navy sockets with phenolic base, solid contact, sealing lip, external brass grounding ring spaced at every 18-inches on center, 12-inches blunt secondary end (no connector).

Each LED lamp shall be 120-volt, 1 watt, 16 LED soft white lamp rated at 40 lumens for up to 50,000-hour lamp life. Provide 10-additional spare light bulbs.

Mounting hardware shall be stainless steel. Furnish steel angles and other steel components as described for structural steel in standard spec 506.2.2. Steel assemblies shall be blasted clean per SSPC-SP6 and galvanized according to ASTM A123.

Cast-in-place anchor bolts and studs, nuts, and washers shall conform to ASTM A307, Grade A, and ASTM A449, ASTM A563, and ASTM F436, as applicable. Hot-dip galvanized bolts and studs including associated nuts and washers according to ASTM A153.

C Construction

C.1 Installation

Provide a decorative lighting system on the Bascule Span and approach spans as shown on the plans.

Attach connection assemblies with steel angle to underside of concrete deck using cast-in-place anchor bolts as shown on the plans.

Lighting fixtures and conduit shall be mounted to steel angles along both sides of the lift span and approach spans as shown on the plans.

Lamp strings for each section installed on the Bascule Span and approach spans shall be continuous and installed without splicing of the conductors. Lamp sockets shall be spaced at 1-foot intervals. Provide each section with a 15-foot leader and a 6-inch tail section. Conductor and lamp socket shall be black.

Architectural lighting shall be installed as recommended by the manufacturer and located as shown on the plans or as directed by the engineer.

C.1.2 Testing

Arrange for and provide all necessary field tests required by the engineer to demonstrate that the entire architectural exterior bridge LED lighting system is in proper working order and according to the plans and these special provisions.

Conduct operational tests of the complete installation in the presence of the engineer to demonstrate to his satisfaction that all components and systems are installed, connected and

operate according to the plans, specifications and approved shop drawings. If the tests show that any piece of equipment, in the judgment of the engineer, is defective or functions improperly, make such adjustments and/or replacements so that the installation is satisfactory to the engineer, and at no extra cost to the department.

D Measurement

The department will measure Architectural Exterior Bridge LED Lighting as each unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.011	Architectural Exterior Bridge LED Lighting	EACH

Payment is full compensation for furnishing and installing the Architectural Exterior Bridge LED Lighting system and provide a full functional system.

46. Operator House Refurbishment, Item SPV.0060.012.

A Description

Furnish all labor, material and tools required for the satisfactory completion of refurbishment of the Cherry Street bridge operator's house according to the plans and as described in these specifications.

This work includes but is not limited to the following:

- Selective Demolition
- Glass Unit Masonry Restoration
- Metal Fabrications, Alternating Tread Device
- Decorative Metal, Plaques and Bell, New and Restoration
- Rough Carpentry
- Thermal Insulation
- Sheet Metal and Trim Restoration
- Joint Sealants
- Stainless Steel Doors and Frames
- FRP Doors and Frames
- Door Hardware
- Aluminum Hinged Insect Screens
- Ceiling Access Panel
- Resilient Base
- Epoxy Flooring
- Interior Painting
- Fire Extinguishers
- Cleaning

Related Articles under Bridge Scope:

- "Concrete Staining" for staining concrete for bridge operator's houses
- "Cast-In-Place Concrete Repair" for bridge operator's houses

B Materials

B.1 Selective Demolition

Demolition and removal of selected portions of building or structure as indicated.

Removal of operator level ceilings and insulation prior to exterior roof and façade washing is required to expose inside surfaces of roof, fascia and louvers during pressure washing to confirm these assemblies do not leak.

Remove rope lighting and supporting channels by cutting back metal straps to roof edge.

Remove existing doors, hardware and frames.

Remove existing interior wall mounted lighting fixtures.

Removal of existing broken glass masonry units is covered in Article C2.

Removal of existing sealants is covered in Article C8.

B.1.1 Definitions

Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to WisDOT.

Remove and Reinstall: Carefully detach items from existing construction, prepare for reuse, and reinstall where indicated.

Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B.1.2 Pre-Demolition Meeting

Conduct meeting at project site. Include WisDOT's site engineer, contractor and all subcontractors performing any tasks associated with work for operator house refurbishment. Conduct meeting at least 7 days before beginning operator house demolition / refurbishment work.

B.1.3 Field Conditions

Hazardous Materials: No hazardous materials will be removed prior to selective demolition. If suspected hazardous materials are encountered, do not disturb; immediately notify WisDOT's site representative. WisDOT's Hazardous materials removal procedures must be followed.

Utility Service: Maintain existing utilities in service and protect them against damage during selective demolition operations.

B.1.4 Performance Requirements

Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

B.2 Glass Unit Masonry Restoration

Water cleaning of all existing unit glass masonry.

Carefully detach from existing construction any cracked or otherwise damaged/clouded glass units, in a manner to prevent damage to adjacent glass unit masonry assembly. Dispose of damaged units removed.

Provide and install replacement glass unit masonry to match existing as shown and as specified.

Tuckpointing of all new and existing glass unit masonry.

Reference Standards:

ASTM C270 – Standard Specification for Mortar for Unit Masonry – 2019.

B.2.1 Administrative Requirements

Preinstallation Meeting: Convene one week prior to commencing work of this section.

Require attendance of parties directly affecting work of this section.

Review conditions of installation, installation procedures, and coordination with related work.

B.2.2 Submittals

Product Data: Provide data for glass units, mortar and cleaning compounds.

Samples: Submit two glass units illustrating size variations, color, and face pattern to match existing.

Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention, etc.

Test results for existing mortar indicating mix components, characteristics and quantities.

Maintenance Materials: Furnish the following for Owner's use in maintenance of project:

Extra Glass Units: Ten of type, size, and pattern matching existing.

B.2.3 Project Conditions

Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

B.2.4 Quality Assurance

Restorer Qualifications: Company specializing in performing the work of this section with minimum three years of documented experience.

Mock-up: Restore and repoint an existing glass masonry wall area sized [4] feet long by 4 feet high; include in mock-up area instances of repointed existing mortar, one new infill glass replacement unit with demonstration of fully cleaned surfaces. Mock-up location as indicated.

Approved mock-up may remain as part of the Work.

Deliver glass masonry neatly wrapped, stacked and tied on pallets. Store clear of ground with adequate waterproof covering.

B.2.5 Suppliers

Salvaged and sound glass units to match existing from Quality Glass Block: www.qualityglassblock.com

B.2.6 Unit Glass Masonry Materials

Hollow Glass Units:

Permanently seal hollow unit by heat fusing joint; with joint key to assist mortar bond. Provide specially shaped units where indicated, including corners and end units.

Nominal Size: Match existing.

Color and Pattern: Match existing.

B.2.7 Mortar Mixes

Use only factory premixed packaged dry materials for mortar, with addition of water only at project site.

Exception: If a specified mix design is not available in a premixed dry package, provide equivalent mix design using standard non-premixed materials.

Mortar and Pointing Material:

Mortar Mix Designs: ASTM C270, Property Specification.

Glass Unit Masonry: Type N mortar and Type O pointing mortar.

Materials:

Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength according to ASTM C270 with the addition of water only.

Type: Type N.

Color: Standard gray.

Water repellent mortar for use with water repellent masonry units.

Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, hydrated lime, and graded sand; capable of producing Type O mortar according to ASTM C270 with the addition of water only.

Color: To match existing mortar.

Water: Clean and potable.

Integral Water Repellent Admixture: Polymeric liquid admixture added to mortar at the time of manufacture.

Performance of Mortar with Integral Water Repellent:

Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours:

No water visible on back of wall above flashing at the end of 24 hours.

No more than 25 percent of wall area above flashing visibly damp at end of test.

Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.

Compressive Strength: ASTM C1314; maximum 5 percent decrease.

Drying Shrinkage: ASTM C1148; maximum 5 percent increase in shrinkage.

Mortar Mixing

Thoroughly mix mortar ingredients according to ASTM C270 in quantities needed for immediate use.

Add admixtures according to manufacturer's instructions; mix uniformly.

Do not use anti-freeze compounds to lower the freezing point of mortar.

If water is lost by evaporation, re-temper only within two hours of mixing.

Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

Mix Testing

Testing of Mortar and Pointing Mix: According to ASTM C780 for compressive strength, consistency, mortar aggregate ratio, water content, air content, and splitting tensile strength.

B.2.8 Cleaning Materials

Cleaning Agent: Detergent type.

B.3 Metal Fabrications – Aluminum Alternating Tread Device

Fabricate and install alternate tread stairs with hand and guard railings at existing opening at southwest bridge house.

B.3.1 Submittals

Shop Drawings: Show fabrication and installation details for metal fabrications.

Include plans, elevations, sections and details of metal fabrications and their connections. Show anchorage and accessory items.

Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

Welding Certificates: Signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" paragraph herein.

B.3.2 Quality Assurance

REFERENCES: OSHA 1910.25: Stairways.

Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this project with a record of successful in-service performance and with sufficient production capacity to produce required units without delaying the work.

Engineer qualifications: A professional engineer licensed by the State of Wisconsin, experienced in providing engineering services of the kind indicated that have resulted in the installation of metal stairs similar to this project in material, design, and extent and that have a record of successful in-service performance.

NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

Pre-assembled Stairs: Commercial class.

B.3.3 Field Conditions

Field Measurements: Verify actual locations of existing southwest bridgehouse operator's level floor opening and other contiguous construction by field measurements before fabrication and indicate measurements on Shop Drawings.

B.3.4 Performance Requirements

Delegated Design: Design metal stairs, handrails and guardrails, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

Structural Performance:

Metal Stairs: Provide metal stairs capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

Uniform Load: 100 lbf/sq. ft..

Concentrated Load: 300 lbf applied on an area of 4 sq. in..

Uniform and concentrated loads need not be assumed to act concurrently.

Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.

Limit deflection of treads, platforms, and framing members to L/240 or 1/4 inch, whichever is less.

Handrails and guardrails: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

Handrails:

Uniform load of 50 lbf/ ft. applied in any direction.

Concentrated load of 200 lbf applied in any direction.

Uniform and concentrated loads need not be assumed to act concurrently.

Top Rails of Guards:

Uniform load of 50 lbf/ ft. applied in any direction.

Concentrated load of 200 lbf applied in any direction.

Uniform and concentrated loads need not be assumed to act concurrently.

Infill of Guards:

Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..

Uniform load of 25 lbf/sq.ft. applied horizontally.

Infill load and other loads need not be assumed to act concurrently.

Limit deflection of handrails and top rails of guards to 1/4 inch, when tested per ASTM E 935.

Thermal Movements: Provide metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Temperature Change (Range): 140 deg F, ambient; 200 deg F, material surfaces.

B.3.5 Product Manufactures

Subject to compliance with requirement herein available manufacturers include:

Precision Ladders, LLC, which is located at: P. O. Box 2279; Morristown, TN 37816-2279; Toll Free Tel: 800-225-7814; Tel: 423-586-2265; Fax: 423-586-2091; Web: www.PrecisionLadders.com

Aluminum Alternating Tread Stair and Components: Stair, mounting brackets and handrails on both sides extending to top landing with a walk through layout.

Basis of Design: Model: Model AT-132 (132" = vertical height - verify) Aluminum Alternating Tread Stair as manufactured by Precision Ladders, LLC.

Capacity: Unit shall support a 1,000 lb (227 kg) total load without failure.

Degree of Incline: **68** degrees.

Performance Standard: Units designed and manufactured to meet or exceed OSHA 1910.25.

B.3.6 Components:

Stair Side Stringers: 3 inch by 2 inch by 1/8 inch (76 mm by 51 mm by 3 mm) extruded 6005-T5 aluminum tubing. Pitch: 68 degrees.

Stair Center Stringer: 10 inch by 1/4 inch (254 mm by 6 mm) extruded 6005-T5 aluminum flat bar. Note: Neoprene trim adhered to front edge of center stringer to protect climber.

Stair Treads: 1 inch aluminum Bar Grating, 9 13/16" (249 mm) deep by 11 7/8" (302 mm) wide on Walk-through models.

Stair Mounting Brackets: 6 inch by 1/4 inch (153 mm by 6 mm) aluminum flat bar

Handrails: 1-1/4 inches (32 mm) Schedule 40, 6005-T5 aluminum pipe provided with internal aluminum fittings.

Anchors: Provide chemical or torque-controlled expansion anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488

Finishes:

- Standard: Mill finish on aluminum stair components.

B.3.7 Fabrication, General

Shop Assembly: Pre-assemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

Form exposed work true to line and level with accurate angles and surfaces and straight edges.

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

At exposed connections, finish surfaces smooth and blended so no roughness shows.

Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

Cut, reinforce, drill, and tap metal fabrications to receive finish hardware, bolts, screws, and similar items.

Provide for anchorage of type coordinated with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

B.3.8 Metal Stairs

Provide complete stair assembly, including metal framing, hangers, struts, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

Stair Framing: Fabricate stringers of structural channels, plates, or a combination thereof. Provide closures for exposed ends of stringers. Construct platforms of structural channel headers and miscellaneous framing members in configuration as indicated. Bolt headers to stringers; and bolt newels and framing members to stringers and headers. If using bolts, fabricate and join so bolts if at all possible are not exposed on finish surfaces.

Treads and Platforms: Form treads to configurations shown and as requires by existing floor levels.

B.3.9 Handrails and Guardrails

Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, and anchorage, but not less than that needed to withstand indicated loads

Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose.

Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

Fabricate stair handrails and guardrail from 1-1/2 inch diameter tube or 1-1/4 inch diameter pipe.

Form changes in direction of railings by bending or by inserting prefabricated fittings.

Form curves by bending members in jigs to produce uniform curvature without buckling.

Close exposed ends of railing members with prefabricated end fittings.

Provide brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.

Completely fabricate stair and railings ready for installation before shipment to the site.

B.4 Decorative Metal

Remove, Restore and Reinstall bridge house bell and commemorative plaques.

Provide and install new cast bronze plaque.

B.4.1 Submittals

Product Data: Manufacturer's data for each type of product indicated.

Shop Drawings: Show installation details for decorative metal items.

B.4.2 Quality Assurance

Contractor Qualifications: Firm experienced in operations similar to those indicated for this project with a record of successful in-service performance and with sufficient capacity to avoid delaying the work.

B.4.3 Materials

New Cast Plaque:

Cast 1/2" bronze plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles and baked on clear coating, stippled background and 1" integrally cast raised flat border.

Mounting: Concealed studs. Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque unless otherwise indicated.

Bronze Castings: ASTM B 584, lead-free alloy recommended by manufacturer and finisher for finish indicated.

Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

Fasteners: Silicon bronze (Alloy 651 or Alloy 655) fasteners where concealed, muntz metal (Alloy 280) fasteners where exposed.

Select fasteners of type, grade, and class required to produce connections suitable for anchoring indicated items to other types of construction indicated.

Walnut shell bell and bell bracket blasting media: Back walnut shell grades.

Granular appearance.

Hardness of MOH 3.5 and Rockwell 91.

Specific gravity of 1.2-1.4.

Stainless steel bell, bracket, adjacent fascia and bronze plaque cleaner: Eastwood After Blast Metal Prep:

www.eastwood.com/ew-after-blast.

Bell and mounting bracket clear coating: Eastwood Diamond Clear Gloss for Bare Metal: www.eastwood.com/eastwood-diamond-clear-for-dtm-painted-surface-gloss-quart , or other comparable product with the following characteristics:

Arrests corrosion (ASTM B 117 – 6000+ hours).

Resistant to salt-spray and other chemicals.

Enhances shine of decorative metals.

Provides long term tarnish protection.

Eliminates need for polishing.

Crystal clear and resistant to UV degradation.

B.5 Miscellaneous Carpentry

Provide rough carpentry work as shown and as specified. Rough carpentry includes:

- Miscellaneous framing with dimension lumber.
- Wood blocking.
- Plywood

B.5.1 General

Wood products shall be factory-marked to identify type, grade, inspection agency, producing mill and other qualities as specified.

Obtain measurements and verify dimensions shown before proceeding with carpentry work.

Keep carpentry materials dry during delivery. Store lumber and plywood in stacks with provisions for air circulation within stacks. Protect bottom of stacks against contact with damp or wet surfaces. Protect exposed materials against weather. Do not store dressed or treated lumber or plywood outdoors.

B.5.2 Lumber

Lumber shall comply with U.S. Product Standard PS-20 for American Softwood Lumber, U.S. Dept of Commerce, and with rules of applicable manufacturer's association or authorized inspection bureau under which each species of lumber is produced.

Nominal sizes shown and specified refer to undressed lumber dimensions. Dress lumber four sides (S4S), unless otherwise shown or specified, and work to shapes and patterns shown. Detailed dimensions show actual sizes required.

Framing and miscellaneous lumber: Construction or No. 2 grade.

Species:

Hem-fir (north); NLGA.

Southern pine; SPIB.

Douglas fir-larch; WCLIB or WWPA.

Maintain 19% maximum moisture content for all pieces of construction lumber. Mark Lumber "DRY."

B.5.3 Plywood

Plywood shall comply with U.S. Product Standard PS-1 for Construction and Industrial Plywood, U.S. Dept. of Commerce, except as otherwise specified.

APA Marine-Grade A-B, in thickness to match existing conditions

B.5.4 Pressure Preservative Treated Wood

Preservative treated lumber and plywood shall comply with the applicable requirements of AWPA U1, Use Category UC3b and shall bear quality mark of an inspection agency approved by ALSC's Board of Review.

Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

Pressure treat wood framing, sheathing, nailers and blocking and similar members in connection with roofing and flashing.

For existing wood framing, sheathing, nailers and blocking and similar members in connection with roofing, and flashing, or where new pressure treated wood is cut after treatment, coat cut surfaces with heavy brush coat of same preservatives used for treatment according to AWWPA M4.

B.5.5 Fasteners

Provide fasteners, anchors, etc., for proper assembly and erection. Fasteners shall be of size to rigidly secure members in place.

For pressure-preservative treated plywood AND lumber, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B.5.6 Metal Framing Anchors

Products: Subject to compliance with requirements, provide the basis-of-design products by:

Simpson Strong-Tie Co., Inc.

Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

B.6 Thermal Insulation

Provide either mineral fiber blanket insulation or loose-fill insulation in framing of bridge operator's house ceiling as shown and as specified.

B6.1 Submittals

Manufacturer's product data for each type of product indicated.

B.6.2 Materials

Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested according to ASTM E84.

Smoke Developed Index: 0 (zero), when tested according to ASTM E84.

Manufacturers:

Knauf Insulation; EcoBatt Insulation: www.knaufinsulation.com/#sle.

Thermafiber, Inc; SAFB FF: www.thermafiber.com/#sle.

Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft. density; flame-spread index of 25 or less according to ASTM E162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.

B.7 Sheet Metal Roofing and Trim Restoration

Power wash / clean existing stainless steel standing seam roofing, fascia and trim.

Inspection for leaks, repair and sealing of roofing, fascia and trim.

Miscellaneous stainless steel drain pan, flashing and trim.

B.7.1 Submittals

Product Data: For each type of product indicated.

Drain Pan Shop Drawings:

- Detail stainless steel drain pan fabrication, drain and installation keyed details.
- Include details for forming, including seams and dimensions.
- Include details of fascia penetrations.

Qualification Data: For fabricator.

B.7.2 Quality Assurance

Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum five years of documented experience.

Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.

B.7.3 Delivery, Storage and Handling

Do not store stainless steel sheet metal materials in contact with other materials that might cause staining, denting, or other surface damage. Store stainless steel sheet metal materials away from uncured concrete and masonry.

Protect strippable protective covering on sheet metal from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal installation.

B.7.4 Performance Requirements

Sheet Metal Roofing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or indicated on Drawings.

Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.

Temperature Change: 130 degrees F, ambient; 200 degrees F, material surfaces.

B.7.5 Materials

Stainless-Steel Sheet: ASTM A 240/A 240M, or ASTM A 666, Type 316, fully annealed.

Nominal Thickness: 0.025 inch.

Exterior Finish: 2B.

B.7.6 Miscellaneous Materials

Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete drain pan system installation.

Fasteners:

Fasteners for Flashing and Trim: Stainless steel blind fasteners or self-drilling screws, gasketed; with hex-washer head.

Blind Fasteners: High-strength stainless-steel rivets suitable for metal being fastened.

Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in stainless steel sheet metal roofing and remain watertight.

Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

B.7.8 Fabrication

Custom fabricate stainless steel sheet metal drain pan and trim to comply with detail recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions (panel width and seam height), geometry, metal thickness, and other characteristics of installation of item required. Obtain field measurements for accurate fit before fabrication of sheet metal and accessories in shop to greatest extent possible.

Form exposed stainless steel sheet metal work to fit substrates with little oil canning; free of buckling and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

Form and fabricate stainless steel sheets, seams, strips, cleats, edge treatments, integral flashings, and other components of metal panels to profiles, patterns, and drainage arrangements indicated on Drawings and as required for leakproof construction.

B.8 Joint Sealants

Remove existing joint sealant system components as indicated on drawings.

Provide and install new joint sealants as shown and as specified.

B.8.1 Submittals

Product Data: For each joint-sealant product indicated.

Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

Samples for Verification: For each type and color of joint sealant required. Install joint sealants in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

B.8.2 Quality Assurance

Obtain elastomeric materials from manufacturers who will, if requested, send a qualified technical representative to advise installer of proper procedures and precautions for use of materials.

Employ only skilled, experienced tradesmen for sealant application.

B.8.3 Materials

Compatibility: Provide joint sealants, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

Colors: Provide colors of exposed joint sealants as selected by Architect from Manufacturer's standard range

Interior Sealants: One-part, siliconized acrylic latex sealant, ASTM C 834, paintable.

Products:

Pecora AC-20 Latex Sealant

Tremco Tremflex #834 Siliconized Acrylic Latex Sealant

Exterior Sealants: Medium Modulus (+/-50%) Structural Silicone Sealant: One-part, neutral cure; ASTM C 920, Type S, Grade NS, Class 50, Use NT, G, A, M, O.

Products:

Dow Corning 795 Silicone Building Sealant

GE SilPruf SCS2000

Pecora 895 Silicone Sealant

Tremco Spectrem 2 or Spectrem 3

Backer Rod: ASTM C 1330 cylindrical sealant backings of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

Cleaners and Primers: Provide joint cleaners and substrate primers recommended by sealant manufacturer for applications indicated.

B.9 Stainless Steel Doors

Provide commercial security non-fire-rated insulated Stainless Steel doors and frames as indicated on drawings and as specified herein.

Related Work:

Article B.12 "Door Hardware" for installation accessories.

B.9.1 Submittals

Product Data: Include construction details, material descriptions, core descriptions, and finishes and one copy of referenced standards/guidelines.

Shop Drawings:

Details of doors, including vertical and horizontal edge details and material thicknesses.

Frame details, including dimensioned profiles and material thicknesses.

Locations of reinforcement and preparations for hardware.

Details of anchorages.

Samples:

Submit two samples showing factory finishes, colors, surface texture, on 6 inch by 6 inch square flat sheet.

Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years documented experience.

Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

B.9.2 Delivery, Storage and Handling

Deliver doors and frames palletized, packaged, or crated during transit and providing necessary protection.

Protect with resilient packaging; avoid humidity build-up under coverings by allowing for air circulation; prevent corrosion and adverse effects on stainless-steel finish.

Do not remove wraps or covers from stainless-steel doors and frame material until ready for installation.

Store door and frame material in up-right vertical position, with wood blocking to raise above floor level and to provide separation between units.

B.9.3 Warranty

Provide manufacturer warranty for doors and frames to be free from material or workmanship defects and within commercial tolerances within a two year period after Date of Substantial Completion.

Correct defective Work within a five year period after Date of Substantial Completion.

B.9.4 Manufacturer

Basis of Design – Insulated Stainless-Steel Doors and Frames Manufacturer:

Next Door Company; Stainless-Steel Doors and Frames: www.nextdoorco.com/#sle.

Other Acceptable Stainless-Steel Doors and Frames Manufacturers:

Steelcraft, an Allegion brand; LS Series: www.allegion.com/#sle.

Megamet Industries, Inc; MegaDoor Stainless Steel Doors: www.megametusa.com/#sle.

B.9.5 Stainless Steel Doors and Frames

Comply with guidelines of NAAMM HMMA 866 for stainless-steel hollow metal doors and frames in highly corrosive environments.

Physical Endurance - Level A (1,000,000 cycles), according to ANSI/SDI A250.4 for Swing Test.

Door Face Sheets: Stainless-steel, Type 316 alloy.

Sheet Thickness: 18 gauge, 0.042 inch, minimum.

Door Finish: No.4 - Brushed satin finish according to ASTM A480/A480M.

Frames: Stainless-steel, knock-down type in compliance with NAAMM HMMA 866, with Type 316 alloy in compliance with ASTM A666.

Sheet Thickness: 16 gauge, 0.053 inch, minimum.

Frame Finish: Same as stainless-steel door finish according to ASTM A480/A480M.

Performance Requirements: Comply with commercial security-resistant design requirements as specified for door type indicated.

Door Core Material: Manufacturers standard insulating core material and construction in compliance with specified requirements.

Door Thickness: 1-3/4 inch.

Vertical Door Edge: Seamless, fully and continuously welded and finished to match No.4 finish of door face.

Top and Bottom Edge of Door: Inverted stainless-steel channel welded to face sheets.

Provide openings in bottom edge to permit escape of entrapped moisture.

Internal Components of Doors, Frames, and In-Fill Panels: Fabricate using stainless-steel with Type 316 alloy for interior metal components, reinforcements, and anchors according to NAAMM HMMA 866.

B.9.6 Performance Requirements

Commercial Security Doors and Frames: Face sheets of stainless-steel.

Security Rating Impact Testing: Comply with forced entry, static load, and soft or hard body impact testing for Class 1 according to NAAMM HMMA 862 requirements.

Provide fully grouted jamb frames for additional security protection.

B.9.7 Assembly

Door Hardware: As specified in Section 11.

Hardware Reinforcements and Preparations: Comply with specified requirements according to NAAMM HMMA 866 and BHMA A156.115.

Electronic Hardware: Provide grout guards, and access plates in compliance with specified requirements according to NAAMM HMMA 866.

Floor and Jamb Anchors: Comply with specified requirements in compliance with NAAMM HMMA 866 for application.

Tolerances: Comply with manufacturing tolerances in compliance with NAAMM HMMA 866 for stainless-steel doors, frames, and hardware.

B.9.8 Stainless Steel Finishes

For No.4 - Brushed satin finish, ensure the following are completed on exposed metal surfaces:

Remove tool and die marks and stretch lines, or blend into finish.

Provide uniform finish, grind and polish exposed surfaces and free of cross hatches.

Provide surfaces that are chemically clean without any embedded foreign materials.

Grain Direction: Ensure specified grain direction runs vertically on door faces and frame jambs.

B.10 FRP Doors and Aluminum Frames

Provide insulated FRP doors and aluminum frames as indicated on drawings and as specified herein:

2 exterior doors, one on equipment level of each operatorhouse.

Related Work:

Article 12 "Door Hardware" for installation accessories.

B.10.1 Submittals

Product Data: Include construction details, material descriptions, core descriptions, and finishes.

Shop Drawings:

Details of doors, including vertical and horizontal edge details and material thicknesses.

Frame details, including dimensioned profiles and material thicknesses.

Locations of reinforcement and preparations for hardware.

Details of anchorages.

B.10.2 FRP Doors

Manufacturer: Chem-Pruf Door

Heavy Duty: Insulated Flush Doors manufactured via press-molding technology.

Construction:

Door Thickness: 1-3/4 inches.

Door Size: Per drawings verify in field.

Stiles and Rails: High-modulus pultruded FRP square or rectangular tube subframe.

Corners: Mitered.

To accept hardware as specified provide a tubular midrail across width of door at lock height, and additional horizontal rails where specific design conditions dictate. Doors shall incorporate molded-in FRP edge strips, chemically bonded to the subframe stiles, for machining of hardware mortises so as not to cut or otherwise compromise the integrity of the pultruded stiles, nor allow moisture to penetrate into the core of the door. All connections shall be chemically welded.

Internal Reinforcement: High-modulus pultruded tubular FRP, high-density polymer compression blocks, or plastic compression blocking at all hardware locations, and corner locations. No wood blocking, steel or aluminum reinforcing plates, ribs or fittings shall be used. A minimum of 900 lbs of pullout strength is required for each factory supplied hinge screw.

Face sheets: Laminated FRP face sheets shall be applied while wet and uncured to the internal door stile and rail subframe/core assembly and then pressmolded under heat and pressure. The composite door panel must be integrally fused over its entire surface area, not just adhesive-bonded at perimeter stiles and rails. Doors shall remain under pressure during curing for flat, warp-free surfaces.

Door facings shall utilize a chemical resistant thermosetting polyester resin system with fiber reinforcing layers. Supplier shall furnish door faces as shown on the drawings and in the door elevations. Chopped strand mat layers shall be used to provide bond integrity between gelcoat, laminated facings and the internal door structure. Structural reinforcement shall be in the form of a knitted multi-layer material with layers of uni-directional glass fiber oriented in both the vertical and horizontal directions for high stiffness, impact resistance and resistance to warping. Gelcoat surface integrally molded to be 25/30 mils thick (wet) ultra-violet light stabilized marine grade NPG-isophthalic polyester gelcoat.

Finish:

The exposed FRP door faces shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Coating shall have a minimum hardness of H to 2H. Finish shall be a slightly textured semi-gloss to minimize the visual effects of wear and tear.

Color: Light Gray Std 4

Core insulation: Polyisocyanurate foam insulation.

R-Value: Minimum of 12.

B.10.3 FRP Door Framing

Door Frames:

FRP Door frames furnished under this specification shall utilize a high-modulus pultruded structural FRP shape. The frame section shall be standard double rabbeted 5-3/4" deep x 2" face, 3/16" thick, with integral 5/8" doorstop with 1 15/16" soffits.

Corner Joints:

Frame jambs and header shall be joined at corners via miter connections with hidden FRP angle clips and associated fasteners. Post and beam corners will not be acceptable. Exposed fasteners for miter connections will not be acceptable.

Hardware Reinforcements:

FRP reinforcing shall be chemically welded to door frame material at required locations. Minimum screw pullout strength of 1100 lb per #12 x 1" sheet metal screw is required. Mechanically fastened reinforcements are not permitted.

Anchors:

Bolt-In: Provide manufacturer's required number of 3/8" diameter x 4" long flat head stainless steel sleeve anchors for masonry openings. Stainless Steel fasteners shall be furnished by the factory. Minimum of five anchors up to 7'-4" on jamb members, and one (1) additional anchor for each foot over 7'-4" height, three (3) on headers.

Finish:

Frames shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Industrial urethane chemical coating color topcoat to match the color and sheen of the doors, for superior weatherability. Gelcoat may not be sprayed onto the frame as a secondary coating.

B.10.4 Fabrication

Verify actual dimensions of openings by field measurements before fabrication, and show recorded measurements on shop drawings.

Fit: Maintain continuity of line and accurate relation of planes and angles.

Hardware: Premachine doors and frames and reinforce members according to templates from specified hardware manufacturers. Drill and tap for fasteners; self-drilling screws are not acceptable.

Test Performance:

ANSI A250.4 1,000,000 cycle test 1. 4' x 8' door (up to a full light) and frame successfully tested in excess of 1,000,000 cycles with no failure of any of the design features of the door or frame.

B.10.5 Metal Finishes

Stainless Steel Finish: Bright, cold-rolled, unpolished: No. 2B.

B.10.6 Delivery, Storage, and Handling

FRP doors and frames are to be delivered to jobsite in adequate crating with foam sheet separations between all components.

It is recommended that the doors be stored indoors in a vertical position, clear of the floor, with blocking between the doors to permit air circulation between the doors and prevent damage to the door faces. Do not wrap in plastic sheeting as it will promote condensation formation within. Permanent discoloration can result. Failure to comply with the receiving and reporting instructions may void warranty.

Use care in handling FRP doors and frames to prevent damage to factory finishes. Wear protective gloves and do not slide or drag doors or frames against one another.

B.11 Door Hardware

Provide door hardware for entry new doors for the bridge operator's house as specified herein.

Package and label each hardware item separately with all screws, bolts and accessories required for a complete installation.

B.11.1 Submittals

Product Data: Catalog cuts and descriptive data of each product indicated.

Shop Drawings: Wiring diagrams for electrified door hardware.

Templates: Furnish hardware templates to doors and frames manufacturer as required for fabrication.

B.11.2 Quality Assurance

Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

Review methods and procedures related to electrified door hardware including, but not limited to, the following:

Inspect and discuss preparatory work performed by other trades.

Inspect and discuss electrical roughing-in for electrified door hardware.

Accessibility Requirements: Comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.

Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.

Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

B.11.3 Hinges

Continuous Hinges: BHMA A156.26; stainless steel, pinless, geared hinge leaves; joined by a continuous stainless steel channel cap; with concealed, self-lubricating thrust bearings. Use hinges that are stainless steel.

Minimum 0.120 inch thick hinge leaves with minimum overall width of 4 inches; fabricated 1 inch less in length than door height to accommodate full width surface sweeps, and to template screw locations; with components finished after milling and drilling are complete.

Manufacturers:

Select Products Limited

Bommer Industries, Inc.

Hager Companies

McKinney Products Company; an ASSA ABLOY Group company

B.11.4 Locksets

Cylindrical Locks: BHMA A156.2; Grade 1, Series 4000.

Manufacturers:

Dorma, LR design.

Schlage, Rhodes design.

Sargent, LL Design.

Lock Throw: 3/4 inch.

Backset: 2-3/4 inches.

Function: Storeroom.

Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.

Construction Cylinders: Standard Lock Cylinders, BHMA A156.5; Grade 1; with interchangeable cores; face finished to match lockset.

Number of Pins: 6.

Permanent Cores: Schlage Primus cylinders provided by WisDOT and exchanged for construction cylinders following substantial Completion.

B.11.5 Electric Strikes

BHMA A156.31; Grade 1.

Provide power supply by same manufacturer as electric strike.

Manufacturers:

Dorma Architectural Hardware; Member of The DORMA Group North America.

Adams Rite Manufacturing Co.; an Assa Abloy Group company.

Security Door Controls.

Von Duprin; an Ingersoll-Rand company.

B.11.6 Door Closers

BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

Manufacturer: LCN Closers; an Ingersoll-Rand company.

B.11.7 Overhead Stops

BHMA A156.8.

Manufacturers:

Architectural Builders Hardware Mfg., Inc.

Glynn-Johnson; an Ingersoll-Rand company.

Rockwood Manufacturing Company.

B.11.8 Weather-Stripping

BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

Manufacturers:

National Guard Products.

Pemko Manufacturing Co.; an ASSA ABLOY Group company.

Reese Enterprises, Inc.

Zero International

B.11.9 Thresholds and Drip Edge

BHMA A156.21; fabricated to full width of opening indicated.

Manufacturers:

National Guard Products.

Pemko Manufacturing Co.; an ASSA ABLOY Group company.

Reese Enterprises, Inc.

Zero International

B.11.10 Finishes

Provide finishes complying with BHMA A156.18.

Satin stainless steel 630 (US32D) except as otherwise indicated.

Interior Door closers: Aluminum painted or powder-coated

B12 Aluminum Hinged Insect Screens

Custom fabricated aluminum hinged in-swing insect screens.

Custom frame extension build-outs for clearance to existing window components.

Preparing of existing windows for installation of new insect screens.

B.12.1 Related Sections

Joint Sealants for filling removed fastener holes in existing windows.

B.12.2 Submittals

Shop Drawings: Field Verify and Indicate plan and vertical dimensions, elevations, component details; head, jamb, and sill details; location of hardware. Provide component details, type and location of fasteners, and accessories or items required of related work.

Product Data: Provide data for screen materials and finishes.

Samples: Submit a sample illustrating screen material, frame section, fastener, and corner section.

Manufacturer's Installation Instructions: Indicate special procedures and/or perimeter conditions requiring special attention.

B.12.3 Qualifications

Manufacturer: Company specializing in manufacturing commercial aluminum window screens with minimum three years documented experience.

Installer: Company specializing in installation of commercial aluminum windows with minimum three years documented experience.

B.12.4 Warranty

Provide full one year manufacturer's warranty against any defects in operation, materials, workmanship under normal use and service.

B12.5 Products

Basis-of-Design: Yale Design Box Screen as manufactured by Allied Window, Inc, 11111 Canal Road, Cincinnati, OH 45241 (513) 559-1212, Dave Martin, www.alliedwindow.com

Construction:

Field Verify approximate 1 to 1-1/2" buildout box of 0.0625 aluminum sheet to provide clearance for existing window cam operation.

S-102 extruded door frame with extruded corners.

1" heavy duty aluminum piano hinge

Extruded aluminum pull handle in clear aluminum finish.

Special magnetic button latches.

"Yale Design" security screens black epoxy stainless steel wire (nylon and fiberglass screens, aluminum or other light weight screens are not acceptable)

Sizes: As field verified by installing contractor for shop drawings. Approximate sizes on drawings are for bid purposes and shall be finalized by contractor prior to fabrication.

Accessories:

Fasteners and Anchors: Non-magnetic stainless steel, or other warranted by manufacturer to be non-corrosive and compatible. All exposed fasteners to be tamper-proof.

B12.6 Fabrication

Fabricate aluminum screens, in sizes indicated on shop drawings. Include a complete system for assembling components and anchoring to windows.

Fabricate aluminum windows screens that can be opened from inside allowing access to sash hardware and operable sash. Accurately fit and secure joints and corners. Make joints flush, hairline, and tight.

Prepare components to receive anchor devices.

Sub-frames: Provide sub-frames with anchors for window units as shown, of profile and dimensions indicated on shop drawings but not less than 0.062-inch-thick extruded aluminum. Miter or cope corners, and weld and dress smooth with concealed mechanical joint fasteners. Provide sub-frames capable of withstanding design loads of window units. Provide components required for anchorage to adjacent construction.

Arrange fasteners and attachments to ensure regular equally spaced pattern as seen from interior. Provide seals to prevent insect access from exterior.

B.12.7 Aluminum Finish

Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Screens: Black powder coated finish.

Finish exposed fasteners to match the surface on which it is installed.

B.13 Ceiling Access Panels

B13.1 Submittals

Product Data: For Ceiling Access Panels.

B13.2 Materials

Ceiling Access Panels; ASTM E119 (2012) for combustible construction.

Manufacturers: Subject to compliance with requirements, provide products by the following:

Babcock Davis

Tough Guy

Frame: 16 gauge cold rolled steel with 1" perimeter flange

Door: 20 gauge cold rolled steel

Insulation: 2 inches mineral wool

Hinge: Continuous piano hinge on long side

Latch: Tool/key operated latch bolt

Closer: Automatic

Finish: Baked on powder coat

B.14 Resilient Base

Rubber cove base as indicated on the Drawings and as specified herein

B.14.1 Submittals

Product Data: For each type of product indicated.

Samples: For each exposed product and for color and texture specified, not less than 12 inches long.

B.14.2 Materials

Rubber Wall Base: ASTM F 1861, Type TP (rubber, thermoplastic).

Group: I (solid, homogeneous).

Style B, Cove.

Manufacturers: Subject to compliance with requirements, provide products by the following:

Armstrong World Industries, Inc.

Burke Mercer Flooring Products, Division of Burke Industries Inc.

Johnsonite; A Tarkett Company.

Mondo Rubber International, Inc.

Nora Systems, Inc.

Roppe Corporation, USA.

Thickness: 0.125 inch.

Height: 4 inches.

Lengths: Coils in manufacturer's standard length.

Outside Corners: Preformed.

Inside Corners: Job formed.

Colors: As selected by Architect from full range of industry colors.

Adhesives: Water-resistant type recommended by resilient base manufacturer for resilient products and substrate conditions indicated.

Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B.15 Epoxy Flooring

Surface preparation and the application of epoxy flooring systems as shown and as specified.

Section includes removal of existing flooring, prepare floor surfaces and installation of new epoxy floor system at all levels level of the bridgehouse.

Section includes installation of trowel or fluid applied epoxy flooring system with integral colored quartz chips and non-slip finish.

B.15.1 Definitions

ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes.

ASTM D695 – Standard Test Method for Compressive Properties of Rigid Plastics.

B.15.2 Submittals

Product Data: Submit data on specified products, describing physical and performance characteristics; sizes, patterns and full range of colors available for selection.

Samples: Submit two samples 4 x 4 inch in size illustrating color, chip size and variation, matrix color, and texture.

Manufacturer's Certificate: Certify products meet or exceed specified requirements.

Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.

Closeout: Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

B.15.3 Warranty

Warranty: Include coverage for delamination of floor and base materials from substrate and degradation of surface finish for a period of five years.

B.15.4 Manufacturer's

Subject to compliance with requirements, provide epoxy floor system by the following:

Sherwin Williams - Ceramic Carpet #400

B.15.5 Components

Epoxy Flooring: Thermosetting two-component epoxy resin binder, colored with select quartz aggregate for slip-resistant finish, complying with the following:

Total flooring thickness: 1/8 inch thick minimum.

Aggregate: Small quartz chips and ceramic granules, multiple colors as selected by Owner from manufacturer's standard colors.

Top Coat: Thermosetting single component epoxy or urethane, clear.

Compressive Strength:

System: ASTM C579; 10,000 psi.

Resin: ASTM D695; 12,000 psi.

Fire Resistance: Weight loss not to exceed limit for non-combustibility, according to ASTM D1360.

Color and Texture: To be selected by Architect from manufacturer's standard colors and textures for non-slip finish.

B.15.6 Accessories

Control Joints: Extruded mill finished aluminum; 1/8 inch wide neoprene filler strip between side strips, height to match flooring thickness, with anchoring features suitable for substrates.

Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

B.16 Interior Painting

Surface preparation and the application of paint systems as shown and as specified.

Paint bridge house interior walls and ceilings; also interior fixtures, fittings, equipment, pipes and conduit that were previously painted.

Staining of the concrete exterior is by others under item number 517.1010.S for Concrete Staining P-40-864.

B.16.1 Definitions

Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523,

B.16.2 Submittals

Product Data: For each type of product. Include preparation requirements and application instructions.

Samples: For each type of paint system and each color and gloss of topcoat.

Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B.16.3 Painting

Surface preparation and the application of paint systems as shown and as specified.

Paint bridge house interior walls and ceilings; interior fixtures, fittings and equipment, including pipes and conduit, that were previously painted.

B.16.1 Definitions

Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523,

MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B.16.2 Submittals

Product Data: For each type of product. Include preparation requirements and application instructions.

Samples: For each type of paint system and each color and gloss of topcoat.

Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B.16.3 Paint

MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

Material Compatibility: For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

Primers: As recommended in writing by topcoat manufacturer for each substrate encountered.

Paint for Walls and Ceiling: Latex, Interior, High Performance Architectural, (Gloss Level 3): MPI #139.

Paint for Interior Metal: MPI #163, Light Industrial Coating, exterior, water based, semi-gloss (Gloss Level 5).

Colors: As selected by Architect from manufacturer's full range.

Mockup Samples:

Provide 12"x12" wall paint mockups in three shades of selected color in location selected by Architect.

Provide 12" long railing paint mockup in three shades of selected color in location selected by Architect.

B.17 Fire Extinguishers

Provide fire extinguishers and wall mounting brackets as shown and as specified.

Provide one unit on each floor level of the Bridge house.

B.17.1 Submittals

Manufacturer's product data and installation instructions.

B.17.2 Manufacturers

Subject to compliance with requirements, provide fire extinguishers and accessories by one of the following:

J.L. Industries

Larsen's Manufacturing Company

Potter-Roemer

Walter Kidde

B.17.3 Products

Fire Extinguishers: Dry chemical, 10 lb capacity, enameled steel container with pressure indicating gauge, for Class A, B, and C fires, charged, dated and bearing UL approval labels. Include manufacturer's standard wall mounting bracket with bottom support for each extinguisher.

B.18 Cleaning

Work includes initial and final cleaning for project closeout of the refurbished buildings.

For mutual understanding, the following terms are defined. Only Routine Procedures (i.e., not requiring unusual chemicals, equipment, expertise or effort) and Appropriate Solutions (i.e., recommended by the manufacturer) will be used in these tasks.

Damp Clean and Dust: Wipe accessible surfaces with a damp cloth to remove accumulated surface debris.

Spot Clean: Use a neutral or multi-surface cleaner to remove marks from exposed surfaces.

Dust Mop: Remove light surface dust, debris, etc. from and sweep hard surface floors and stairways.

Wet Mop: Apply solution, mop scrub and remove solution. Rinse if needed to remove cleaning residue.

Machine Scrub: Lightly machine scrub: Use a general or heavy-duty cleaner solution with the appropriate pad to remove the top layer of soil.

All work shall be performed by employees specializing in professional commercial cleaning systems with minimum three years documented experience.

Contractor shall ensure that Material Safety Data Sheets for all chemical products are available for review by all employees.

Products:

Multi-Surface Cleaner: 3M Multi-Surface Cleaner or as recommended by specified finish manufacturer.

Neutral Cleaner: 3M Neutral Cleaner or as recommended by specified finish manufacturer.

C Construction

C.1 Selective Demolition

C.1.1 Examination

Verify that utilities have been disconnected and capped before starting selective demolition operations.

Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly report in writing to the WisDOT's engineer.

C.1.2 Utility Services and Mechanical / Electrical Systems

Existing Services/Systems to Remain: Maintain services/systems except those indicated to be removed and protect them against damage.

Existing Equipment/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

C.1.3 Preparation

Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent building components and facilities to remain.

Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or damage to construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

C.1.4 Selective Demolition, General

General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

Dispose of demolished items and materials promptly.

C.1.5 Removed and Reinstalled Items

See Article C.4: Bridge House Bell and Commemorative Plaque.

C.1.7 Existing Items to Remain

Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the WisDOT's engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

C.1.8 Disposal of Demolished Materials

General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain city's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

Do not allow demolished materials to accumulate on-site.

Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent

Disposal: Transport demolished materials off city's property and legally dispose of them.

C.1.9 Cleaning

Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.

C.2 Glass Unit Masonry Restoration

C.2.1 Examination

Verify that surfaces to be cleaned are ready for work of this section.

C.2.2 Preparation

On metal surfaces adjacent to glass unit masonry assemblies, remove mortar, sealants, and other residue resulting from glass-block installation, in a manner approved by manufacturers of materials involved.

Remove excess sealants with commercial solvents according to sealant manufacturer's written instructions.

Protect surrounding elements from damage due to restoration procedures.

Separate areas to be protected from restoration areas using means adequate to prevent damage.

Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.

When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.

Do not allow cleaning runoff to drain into sanitary or storm sewers.

C.2.3 Rebuilding

Support structure as necessary in advance of cutting out units.

Cut out damaged and deteriorated glass units with care in a manner to prevent damage to any adjacent remaining materials.

Cut away adjoining glass masonry mortar as necessary to replace damaged glass block.

Erect glass units and accessories according to manufacturer's instructions.

Mortar Mix: Colored and proportioned to match existing work.

Provide full mortar joints. Furrowing is not permitted. Remove excess mortar.

Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line.

Tolerances:

Variation From Joint Width: Plus 1/8 inch and minus 0 inches.

Maximum Variation from Plane of Unit to Adjacent Unit: 1/32 inch.

Maximum Variation of Panel from Plane: 1/8 inch.

C.2.4 Pointing with Mortar

Before mortar sets, rake out joints to depth of 1/2" to 5/8" inch.

Fill joints with pointing mortar; press into joint to eliminate voids; neatly tool surface to a concave profile.

Remove excess pointing mortar.

C.2.5 Repointing Existing Glass Masonry Units

Perform repointing prior to cleaning masonry surfaces.

Cut out loose or disintegrated mortar in joints to minimum 1/2 inch depth or until sound mortar is reached.

Do not damage glass masonry units.

Use power tools only after test cuts determine no damage to glass masonry units will result.

When cutting is complete, remove dust and loose material by brushing.

Premoisten joint and apply mortar. Pack tightly in maximum 1/4 inch layers. Form a smooth, compact concave joint to match existing.

Moist cure for 72 hours.

C.2.6 Mortar Cleaning and Protection

Immediately remove stains, efflorescence, or other excess resulting from the work of this section.

Clean glass unit masonry assemblies as work progresses. Remove mortar fins, smears and droppings immediately, using a clean, wet sponge or a scrub brush with stiff nylon fiber bristles as work proceeds and upon completion.

Clean surrounding surfaces.

C.2.7 Restoration Cleaning

Verify mortar is fully set and cured.

Clean surfaces and remove large particles with nylon brushes.

Clean glass with detergent solution; do not use harsh cleaners, acids, abrasives, steel wool, or wire brushes when removing mortar or cleaning glass unit masonry assemblies.

Scrub walls with detergent type cleaning agent solution using stiff brush.

Thoroughly rinse and wash off cleaning solution, dirt and mortar crumbs using clean, pressurized water.

Protect area below cleaning operation and keep existing cast in place concrete soaked with water and flushed free of cleaning product and dissolved mortar continuously for duration of cleaning.

Before solution dries, rinse and remove cleaning solution and dissolved mortar, using clean, pressurized water.

Final Cleaning:

Perform final cleaning of glass unit masonry assemblies inside and outside when bridge and bridge house construction is substantially complete and surface is not exposed to direct sunlight. Start at top of panel using generous amounts of clean water. Remove water with clean, dry, soft cloths; change cloths frequently to eliminate dried mortar particles and aggregate.

Polish faces of glass unit masonry, using materials and technique that will not scratch or deface units.

Provide protection without damaging completed work.

C.3 Metal Fabrications

C.3.1 Examination

Examine locations where metal fabrications are to be installed and verify that surfaces are prepared to receive work.

If substrate preparation is the responsibility of another installer, notify WisDOT's engineer of unsatisfactory preparation before proceeding.

Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

C.3.2 Installation

Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).

Align rails so variations from level for horizontal members and variations from parallel with rake of steps for sloping members do not exceed 1/4 inch in 12 feet.

Adjust railings before anchoring to ensure matching alignment at abutting hairline joints.

Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction according to manufacturer's engineer's shop drawings.

C.3.3 Protection

Protect installed products until completion of project.

Clean, repair or replace damaged products before Substantial Completion.

C.4 Decorative Metal

C.4.1 Restoration

Carefully remove items indicated for restoration, except as otherwise indicated. Clean and reinstall repair in original locations or as indicated on the drawings.

Test cleaning products on inconspicuous, (back), of bronze plaques and inside of stainless steel bell to verify effectiveness and confirm cleaner will not damage items. Architect to approve test cleaning results.

Following WisDOT's approval, clean items per manufacturer's written instructions. Buff or polish to restore original metal surfaces.

Test clear coating on inconspicuous surface of cleaned items. Following WisDOT's approval, apply clear coating after restoration, by air spray in two coats per manufacturer's written instructions, with interim drying, to a total thickness of 1 mil.

Pack or crate items after cleaning and repairing. Identify contents of containers.

Protect items from damage during transport and storage.

Reinstall items accurately in location, alignment, and elevation indicated. Provide connections, supports, and miscellaneous materials necessary for installation.

C.4.2 Plaque Installation

Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.

Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface. Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.

Clean installed plaques as recommended by manufacturer.

C.4.3 Protection

Protect finishes of decorative metal from damage during construction period with temporary protective coverings. Remove protective covering at time of Substantial Completion.

Restore finishes damaged during installation and construction period so no evidence remains of correction work.

C.5 Miscellaneous Carpentry

C.5.1 Examination

Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

Proceed with installation only after unsatisfactory conditions have been corrected.

C.5.2 Preparation

Clean substrates of projections and substances detrimental to application.

C.5.3 Installation

Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.

Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

Do not splice structural members between supports unless otherwise indicated.

Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

Plywood: Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

NES NER-272 for power-driven fasteners.

Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

C.6 Thermal Insulation

C.6.1 Installation of Thermal Insulation

Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

Extend insulation to envelop entire area to be insulated. Remove projections that interfere with placement.

Mineral-Fiber Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

Install blankets according to ASTM C 1320.

Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.

Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

Loose-Fill Insulation: Apply according to ASTM C 1015 and manufacturer's written instructions. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.

C.7 Sheet Metal Restoration

C.7.1 Examination

Verify that drain pan is dimensioned to fit below existing north louver openings as indicated on shop drawings and flashings are ready to receive this work.

C.7.2 Drain Pan Installation

Install drain pan according to manufacturer's shop drawings and instructions.

Install drain pan level with positive drainage and fastened to attic framing. Coordinate installation with flashings, drain and other components.

Install flashings and align drain pan assembly to ensure moisture shed from pan through drain with diversion of moisture to exterior.

Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Install work with laps, joints, and seams that are permanently watertight and weather resistant.

C.8 Joint Sealants

C.8.1 Project Conditions

Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:

When adverse or inclement weather conditions are impending or when ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturers.

When joint substrates are wet due to rain, frost, condensation or other causes.

Joint Width Conditions: Do not proceed with installation of joint sealants when joint widths are less than recommended by joint sealant manufacturer for application indicated.

Inspection: Inspect joints indicated to receive joint sealants for compliance with requirements for joint configurations, installation tolerances and other conditions affecting joint sealant performance. Submit written report listing any conditions detrimental to performance of joint sealant work. Do not allow joint sealant work to proceed until unsatisfactory conditions have been corrected. Start of installation is evidence of acceptance of substrate.

C.8.2 Preparation

Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

C.8.3 Installation

Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

Do not leave gaps between ends of sealant backings.

Do not stretch, twist, puncture, or tear sealant backings.

Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

Install sealants using proven techniques that comply with the following and at the same time backings are installed:

Place sealants so they directly contact and fully wet joint substrates.

Completely fill recesses in each joint configuration.

Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

Remove excess sealant from surfaces adjacent to joints.

Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

Clean off excess sealant or sealant smears adjacent to joints as the work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

C.9 Stainless Steel Doors and Frames

C.9.1 Examination

Examine existing substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the work.

Verify that finished substrate surfaces are in plane to ensure proper door alignment.

Verify that finished floor area within path of door swing provides for unobstructed door operation and correct as necessary.

Proceed with installation only after unsatisfactory conditions have been corrected.

All opening measurements are the responsibility of installer.

Do not proceed with installation until support structure and substrates have been properly prepared and deviations from manufacturing tolerances are corrected; commencement of installation constitutes acceptance of conditions.

C.9.2 Installation

Install doors and frames according to manufacturer's instructions and related requirements of specified door and frame standards guidelines indicated.

Install prefinished frames after painting and wall finishes are complete inside and outside.

Install stainless steel frames and door work plumb, rigid, properly aligned, and securely fastened in place; to comply with Drawings.

Coordinate frame anchor placement with substrate construction.

Provide anchors appropriate for substrate door frame is fastened to and conditions specified for loading on door and frame and anchor frames securely in place.

Set thresholds in a full bed of quick-set mortar or non-shrink grout and caulk all edges of threshold.

Install stainless steel doors plumb, level, square, true to line, and without warp or rack.

Install door hardware as specified in Section 11. Comply with recommended practice for hardware placement of stainless-steel doors and frames according to NAAMM HMMA 866, NAAMM HMMA 830 and NAAMM HMMA 831.

Coordinate installation of electrical connections with electrical hardware items being installed on doors and/or frames.

Install exterior doors to be weathertight in closed position.

Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated according to NAAMM HMMA 866.

Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

Adjust for smooth and balanced door movement.

Repair minor damages to finish according to manufacturer's instructions. Touch up stainless-steel immediately after erection, smooth scratched or damaged areas and polish to match adjacent undamaged finish.

Remove and replace damaged components that cannot be successfully repaired as determined by the WisDOT engineer.

Any workmanship which is defective or deficient shall be corrected to WisDOT's satisfaction and at no additional cost to WisDOT .

Fit stainless steel doors accurately in frames, within clearances specified below. Shim as necessary.

Jambs and Head: 1/8 inch plus or minus 1/16 inch.

Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.

C.9.3 Adjusting, Cleaning and Protection

Install doors to swing freely and to stand open at any angle. Adjust doors, hinges, and locksets for smooth operation without binding. All surface applied hardware shall be through-bolted. After installation make final adjustments for proper operation and latching.

Clean doors promptly after installation according to manufacturer's instructions.

Clean exposed surfaces of stainless doors and frames with a mild, non-abrasive cleaner and water.

Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial

C.10 FRP Doors and Frames

C.10.1 Examination

Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the work.

Proceed with installation only after unsatisfactory conditions have been corrected.

All opening measurements are the responsibility of installer.

C.10.2 Installation

Install FRP frames and door work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

Install doors plumb, level, square, true to line, and without warp or rack.

Anchor frames securely in place. In-Place Concrete:

Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

Set thresholds in a full bed of quick-set mortar or non-shrink grout and caulk all edges of threshold.

Install exterior doors to be weathertight in closed position.

Repair minor damages to finish according to manufacturer's instructions.

Remove and replace damaged components that cannot be successfully repaired as determined by WisDOT's engineer.

Arrange an in-service session at WisDOT's convenience.

Any workmanship which is defective or deficient shall be corrected to WisDOT's satisfaction and at no additional cost to WisDOT.

Fit FRP doors accurately in frames, within clearances specified below. Shim as necessary.

Jambs and Head: 1/8 inch plus or minus 1/16 inch.

Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.

C.10.3 Adjusting, Cleaning and Protection

Install doors to swing freely and to stand open at any angle. Adjust doors, hinges, and locksets for smooth operation without binding. All surface applied hardware shall be through-bolted. After installation make final adjustments for proper operation and latching.

Clean doors promptly after installation according to manufacturer's instructions.

Clean exposed surfaces of FRP doors and frames with a mild, non-abrasive cleaner and water.

Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial.

C.11 Door Hardware

C.11.1 Preparation

For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

Review methods and procedures related to electrified door hardware including, but not limited to, the following:

Inspect and discuss preparatory work performed by other trades.

Inspect and discuss electrical roughing-in for electrified door hardware.

C.11.2 Installation

Mounting Heights: Mount door hardware units at heights to comply ANSI/SDI A250.8, unless otherwise required to comply with governing regulations.

Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.

Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene sealant.

C.11.3 Adjusting

Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

C.12 Aluminum Hinged Insect Screens

C.12.1 Examination

Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Verify sizes indicated on shop drawings match available flush surfaces for perimeter of insect screen mounting location.

Verify screen frame extensions provide clearance to cam levers of existing operable windows.

Verify screen fastener locations do not compromise operation of existing windows.

Proceed with installation only after unsatisfactory conditions have been corrected.

C.12.2 Preparation

Remove any existing work including abandoned fasteners, tracks, attachments, etc., carefully; avoid damage to existing work to remain. Protect existing window frame surface.

Clean substrate surfaces.

Where demolition work was performed or previously performed to remove items that leave fastener penetration holes, provide sealant infill at each hole.

12.3 Installation

Comply with manufacturer's written instructions for installing screens and other components.

Install screens level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to window, window hardware and other adjacent construction to produce insect tight construction.

Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

ERECTION TOLERANCES

Maximum Variation From Plumb or Level: 1/4 inch.

Maximum Misalignment From True Position: 1/4 inch.

C.12.4 Adjusting, Cleaning and Protection

Adjust operating screens and hardware for a tight fit at contact points, no gaps and for smooth operation.

Clean exposed surfaces immediately after installing screens. Avoid damaging protective coatings and finishes. Remove dirt, and other substances.

Protect screen surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact surfaces, remove contaminants immediately according to manufacturer's written instructions.

C.13 Ceiling Access Panel

Install ceiling access panel where indicated. Securely fasten to structure, level, square and plumb, according to manufacturer's instructions.

C.14 Resilient Base

C.14.1 Preparation

Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

Do not install resilient products until they are the same temperature as the space where they are to be installed.

Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

C.14.2 Installation

Comply with manufacturer's written instructions for installing resilient base.

Apply resilient base to walls, pilasters, and other permanent fixtures in rooms and areas where base is required.

Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

Do not stretch resilient base during installation.

Preformed Outside Corners: Install preformed corners before installing straight pieces.

Job-Formed Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

Miter or cope corners to minimize open joints.

Comply with manufacturer's written instructions for cleaning and protecting resilient products.

C.15 Epoxy Flooring

C.15.1 Environmental Requirements

Material shall be delivered to the project site in manufacturer's original unopened containers bearing manufacturer's name, product and color.

Store materials in dry, secure area, for three days prior to installation in area of installation to achieve temperature stability.

Maintain minimum temperature in storage area of 50 degrees F.

Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

C.15.2 Examination

Verify that substrate is ready to receive work, and that subfloor surface is clean, dry, and free of substances which could affect bond.

Do not begin work until concrete substrate has cured 28 days minimum, and measured moisture content is not greater than 16 percent.

C.15.3 Preparation

Mask/cover existing adjacent surfaces or areas that require protection from flooring installation operations.

Prepare surfaces as required by manufacturer for shot blast or grind existing substrate.

Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with filler as recommended by manufacturer.

Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind remaining irregularities above surface level. Prohibit traffic until filler is cured.

Clean and vacuum substrate.

C.15.4 Joint Installation

Install strips straight and level at existing substrate control joint locations.

Clean and vacuum entire surfaces.

C.17.5 Flooring Installation

Mix all materials in strict accordance with manufacturers instructions.

Apply primer/body coat within thickness range required by manufacturer.

Broadcast selected color quartz into wet epoxy to provide non-slip finish and cure as required.

Apply clear chemical resistant epoxy top coat to achieve final finish and texture selected.

Finish to smooth level surface, following original flatness and slope.

C.15.6 Protection

Prohibit traffic on floor finish until cured; minimum 48 hours after installation.

Barricade area to protect flooring until cured.

Remove all materials from site.

C.16 Painting

C.16.1 Examination

Examine substrates and conditions for compliance with requirements affecting performance of the work.

Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

Concrete: 12 percent.

Masonry (Clay and CMU): 12 percent.

Plaster: 12 percent.

Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

Proceed with coating application only after unsatisfactory conditions have been corrected.

Application of coating indicates acceptance of surfaces and conditions.

C.16.2 Preparation

Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

Remove incompatible primers and reprime substrates with compatible primers or apply tie coat as required to produce paint systems indicated.

C.16.3 Application

Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

Apply 1 coat primer and 2 coats finish. Apply additional coats when undercoats, stains or other conditions show through final coat of paint; paint film shall be of uniform finish, color and appearance.

Omit primer on metal surfaces which have been shop-primed and touch-up painted, unless otherwise directed by the Architect.

Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

C.16.4 Cleaning and Protection

After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by WisDOT engineer, and leave in a restored condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

C.17 Fire Extinguishers

Install fire extinguishers and surface wall mounting brackets as directed by the Field Building Inspector. Securely fasten to structure, square and plumb, according to manufacturer's instructions.

C.18 Cleaning

Project site must be kept in a neat and orderly condition at all times and be final cleaned when all other cleaning work has been completed.

Final cleaning shall be accomplished with the utmost care to avoid damage to equipment, surfaces and finishes.

Initial/Final Cleaning Scope:

Initial Floors: Concrete (Non-Painted): Machine scrub.

Finished Floors: As recommended by floor finish manufacturer.

Initial Concrete Walls: Dust as necessary. Use a neutral or multi-surface cleaner to wipe down.

Final Concrete Walls: Dust as necessary.

Initial Exposed Steel: Dust as necessary. Use a neutral or multi-surface cleaner to wipe down.

Final Exposed Steel: Dust as necessary.

Final Glass: Interior and Exterior minor paint removal; clean both sides.

Final Doors, Window and Screen Frames: Wipe aluminum and FRP frames.

Final Light Fixtures: Wipe down at all locations with a neutral or multi-surface cleaner.

Remove waste and surplus materials, rubbish, and construction facilities from site.

D Method of Measurement

The department will measure Operator House Refurbishment by each house, acceptably completed.

E Basis of Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.012	Operator House Refurbishment	EACH

Payment is full compensation for Operator House Refurbishment, including glass unit masonry cleaning and restoration, metal roof fascia and trim cleaning, rough carpentry, thermal insulation, sheet metal drain pans, metal stair, joint sealants, stainless steel and FRP doors and frames, aluminum windows screens, door hardware, ceiling access panels, epoxy floors, resilient base, painting, fire extinguishers and

ornamental bell, new and restored commemorative plaques according to the drawings and as set forth in these specifications.

47. Operator House HVAC, Item SPV.0060.013.

A Description

A.1 Work Summary

This special provision describes the installation of the heating and ventilating (HVAC) equipment and systems.

A.2 Regulatory Requirements

- State and Local Codes
- Conform to all state and local code requirements.
- Permits and Inspections

Obtain permits and request inspections from authority having jurisdiction and pay for all Permit fees incidental thereto.

A.3 Equipment Accessibility

Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing.

A.4 HVAC Installations

Coordinate HVAC equipment and materials installation with other building components. Verify all dimensions by field measurements. Arrange for chases, slots and openings in other building components to allow for HVAC installations. Install HVAC equipment to facilitate maintenance and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installation.

A.5 Quality Assurance

Electrical characteristics for HVAC equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified, and costs associated for modifications are included as part of the contractor's work. If minimum energy ratings or efficiencies are specified, equipment is to comply with requirements.

A.6 Delivery, Storage and Handling

Deliver HVAC materials with appropriate protective packaging with labels in place. Deliver pipes and tube with factory-applied end caps. Maintain end caps through shipping, storage and handling to prevent pipe end damage and to prevent entrance of dirt, debris and moisture.

A.7 References

National Fire Protection Association (NFPA)

- NFPA 54 (ANSI Z223.1) National Fuel Gas Code.
- NFPA 255 Building Materials, Test of Surface Burning Characteristics.
- NFPA 90A Installation of Air Conditioning and Ventilating Systems.

NFPA 90B Installation of Warm Air Heating and Air Conditioning Systems.

American Society for Testing & Materials (ASTM)

- ASTM C612 Specification for Mineral Fiber Block and Board Thermal Insulation.
- ASTM B32 Specification for Solder Metal
- ASTM B280 Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
- ASTM A90 Test Method for Weight of Coating on Zinc-Coated (Galvanized Iron or Steel Articles.

- ASTM A525 Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process.
- ASTM A527 Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process, Lock Forming Quality.
- ASTM C553 Specification for Mineral Fiber Blanket and Felt Insulation (Industrial Type).

Underwriters Laboratories (UL)

- UL 723 Test for Surface Burning Characteristics of Building Materials.
- UL 181 Factory-Made Air Ducts and Connectors
- UL 441 Standard for Gas Vents

American National Standards Institute (ANSI)

- ANSI/ASHRAE 34 Number Designation of Refrigerants.
- ANSI/ASME B16.22 Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
- ANSI/ASME B31.5 Refrigeration Piping.
- ANSI/ARI 710 Driers, Liquid-Line.
- ANSI/ASHRAE 90A Energy Conservation in New Building Design.
- ANSI/ASHRAE 103 Heating Seasonal Efficiency of Central Furnaces and Boilers, Methods of Testing.

Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

48. SMACNA Low Pressure Duct Construction Standards.

Air Movement and Control Association (AMCA)

- AMCA 99 Standards Handbook
- AMCA 210 Laboratory Methods of Testing Fans for Rating Purposes.
- AMCA 300 Test Code for Sound Rating Air Moving Devices.
- AMCA 301 Method of Calculating Fan Sound Ratings from Laboratory Test Data.

Air Conditioning and Refrigeration Institute (ARI)

- ARI 201/240 Unitary Air Conditioning and Air Source Heat Pump Equipment

ARI 530 Positive Displacement Refrigerant Compressors, Compressor Units and Condensing Units.

A.8 Submittals

A.8.1 Equipment and Material Shop Drawings

Submit shop drawings which include equipment information and product data for equipment listed below for review:

Electric Unit Heaters.

Ductless Split A/C Systems including all accessories.

A.8.2 Report and Manuals Submittal

Submit the Reports and Manuals requested for review:

HVAC operating and maintenance manual including warranty documentation.

B Materials

B.1 Basic HVAC System Materials and Methods.

B.1.1 Pipe, Tube, and Fittings - General

Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

B.1.2 Joining Materials - General

Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

B.1.3 Pipe Penetrations - General

Provide steel pipe sleeves with minimum wall thickness of 1/4 inch for pipes passing through beams and walls of concrete, brick, tile, or masonry, and 22 gage galvanized iron sleeves for pipes passing through other parts of construction. Provide steel pipe for all sleeves penetrating floors. Furnish each sleeve having inside diameter 1 inch larger than outside diameter of un-insulated and insulated pipe, unless wall or floor is a fire wall or barrier, in which case, only the pipe to penetrate.

For pipes passing through floors, walls, and ceilings provide chrome-plated brass escutcheons having outside diameter to cover sleeved openings and inside diameter to fit pipe.

B.1.3.1 Non-Rated Surfaces Stamped steel, chrome plated, hinged, split ring escutcheons or floor-ceiling plates for covering openings in occupied spaces.

In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated pipe and the cored opening or a water stop type wall sleeve.

At interior partitions where pipe penetrations are sealed, use Tremco Dymonic, Sika Corp. Sikaflex 1a, Sonneborn Sonolastic NPI, or Mameco Vulken 116 urethane caulk to affect the seal. Use galvanized sheet metal sleeves in hollow wall penetrations.

B.2 Identification and Painting for HVAC Systems

B.2.1 Materials – Identification Systems

Color: Unless specified otherwise, conform with ANSI/ASME A13.1.

Snap On Plastic Pipe Markers: Manufacturer's standard preprinted, semi rigid snap on, color coded pipe markers, conforming to ASME A13.1

Plastic Equipment Markers: Laminated plastic, color coded equipment markers: Conform to following color code:

Green: Cooling equipment and components.

Yellow: Heating equipment and components.

Yellow/Green: Combination cooling and heating equipment and components.

Nomenclature: Include following, matching terminology on schedules as closely as possible:

- Name and plan ID number.
- Equipment service.
- Size: Approximately 2½ by 4 inches (65 by 100 mm) for control devices, dampers, and valves; and 4½ by 6 inches (115 by 150 mm) for equipment.

Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification, with corresponding designations indicated. Use numbers, letter, and wording indicated for proper identification and operation/maintenance of mechanical systems and equipment.

B.4 Refrigerant Piping and Specialties

B.4.1 Piping

Copper Tubing: ASTM B280, Type ACR hard drawn or annealed.

Fittings: ANSI/ASME B16.22 wrought copper.

Joints: ANSI/ASTM B32, solder Grade 95TA or ANSI/AWS A5.8 BCup silver braze.

Factory precharged linesets are acceptable.

B.4.4 Refrigerant Piping Insulation

Flexible, close-cell elastomeric pipe insulation conforming to ASTM C534 Grade 1, Type I: AP Armaflex with appropriate adhesive; Armaflex 520.

B.5 Ductless Split-System Air-Conditioning Units

B.5.1 Manufacturers

Subject to compliance with requirements, provide products by one of the following:

LG Electronics USA, Inc.

Mitsubishi Electronics America, Inc.; HVAC Division.

B.5.2 Refrigerant

Refrigerant to be R410A.

B.5.3 Outdoor Unit

The system to have one air source outdoor unit.

The refrigerant circuit to be field piped to a single matching indoor unit to effectively and efficiently control the heating or cooling operation of the system.

All refrigerant piping from outdoor unit to indoor unit to be factory insulated.

Factory installed microprocessor controls in the outdoor unit and indoor unit to perform functions to efficiently operate the single zone system and communicate via minimum 18 AWG, 4-conductor, stranded, shielded or unshielded power/communication cable. If shielded, it must be grounded to chassis at ODU only.

The outdoor unit to be internally assembled, wired and piped from the factory.

The factory assembled system to have the outdoor unit fitted with refrigerant strainer, check valves, oil separator, accumulator, 4-way reversing valve, electronic expansion valve, high side and low side refrigerant charging ports, and a service port.

- Piping Capabilities

The outdoor unit to be capable of operating at an elevation 32.8 feet above or below the indoor units.

The outdoor unit to be capable of operating with up to 65.6 feet of total equivalent refrigerant piping length.

- Defrost Operations

The outdoor unit to be capable of auto defrost operation to melt accumulated ice off the outdoor unit heat exchanger. The defrost cycle control to be based on outdoor ambient temperatures and outdoor unit heat exchanger temperatures.

- Oil Management

The outdoor unit to have an oil injection mechanism to ensure a consistent film of oil on all moving compressor parts at low speed.

The outdoor unit to have an oil separator to separate oil mixed with the refrigerant gas during compression and return oil to the compressor.

- Cabinet

The outdoor unit cabinet to be made of pre-coated metal (PCM).

The front/side panels of the outdoor unit to be removable type for access to internal components.

Outdoor unit cabinet to be tested according to ASTM B-117 salt spray test procedure for a minimum of 1000 hours.

- Fan Assembly

The outdoor unit to be equipped with one direct drive variable speed propeller fan with Brushless Digitally Controlled (BLDC) motor with a horizontal air discharge.

The fan blades to be made of Acrylonitrile Butadiene Styrene (ABS) material.

The fan to be equipped with permanently lubricated bearings.

The fan motor to have variable speed to a maximum of 950 RPM.

The fan to have a raised guard to help prevent contact with moving parts.

- Outdoor Coil
 - The outdoor unit to have a factory-built coil comprised of aluminum fins mechanically bonded on copper tubing.
 - The aluminum fins to have factory applied corrosion resistant GoldFin™ material.
 - Coil coating to be tested according to ASTM B-117 salt spray test procedure for a minimum of 1000 hours.
 - The outdoor unit coil to be factory tested to a pressure of 600 psig.
 - The coil for each outdoor unit to have a minimum of 14 Fins per Inch (FPI).
 - The coil for each outdoor unit to have a 2-row heat exchanger.
 - The outdoor unit cabinet to have a coil guard.
- Compressor
 - Each 3/4 to 1-ton outdoor unit to be equipped with one hermetically sealed, digitally controlled, inverter driven single-rotary compressor with vibration isolation.
 - The compressor to be mounted on vibration attenuating rubber grommets.
 - The compressor to use a factory charge of Polyvinyl Ether (PVE) oil.
 - The compressor bearing(s) to have Teflon™ coating.
 - The compressor to be equipped with over-current protection.
- Sound Levels
 - The outdoor unit to have sound levels not exceeding 55 dB(A) tested in an anechoic chamber under ISO1996 standard.
- Sensors
 - The outdoor unit to have:
 - Suction temperature sensor
 - Discharge temperature sensor
 - High pressure sensor
 - Low Pressure sensor
 - Outdoor temperature sensor
 - Outdoor unit heat exchanger temperature sensor

B.5.4 Indoor Units

Ceiling and Wall Mounted – General (See Ductless Split System Equipment Scheduled for indoor unit types required).

Unit to be factory assembled, wired, piped and run tested.

Unit to be designed to be installed for indoor application.

Unit to be attached to an installation plate/bracket that secures unit to the ceiling and/or wall (depending on model) or can be converted for surface mounting to a hard surface ceiling.

- Casing/Panel
 - Unit case to be manufactured of heavy-duty Acrylonitrile Butadiene Styrene (ABS) and High Impact Polystyrene (HIPS) plastic.
 - Unit case to have a pearl white finish.

- Cabinet Assembly

Unit to have supply air outlet and return air inlet. For ceiling mounted units, the unit to also be supplied with an outdoor air intake for occupancy ventilation.

Unit to be equipped with factory installed temperature thermistors for

- Return air

- Refrigerant entering coil

- Refrigerant leaving coil

Unit to have a built-in control panel to communicate with the outdoor unit.

Unit to have the following functions as standard

- Self-diagnostic function

- Auto restart function

- Auto changeover function

- Auto clean function

- Dehumidifying function

- Hot Start

- Sleep mode

Unit to be capable of refrigerant piping in 4 different directions.

Unit to be capable of drain piping in 2 different directions.

- Fan Assembly

The unit to have a direct drive, cross flow fan made of high strength ABS plastic.

The fan motor is Brushless Digitally controlled (BLDC) with permanently lubricated and sealed ball bearings.

The fan/motor assembly to be mounted on vibration attenuating rubber grommets.

The fan speed to be controlled using microprocessor based direct digitally controlled algorithm.

In cooling mode, the indoor fan to have the following settings: Low, Med, High, Power Cool, and Auto.

In heating mode, the indoor fan to have the following settings: Low, Med, High, Power Heat, and Auto.

The Auto fan setting to adjust the fan speed to most effectively achieve the set-point.

Unit to have factory installed motorized louver to provide flow of air in up and down direction for uniform airflow.

Unit to have factory installed motorized guide vane to control the direction of flow of air from side to side.

- Filter Assembly

The return air inlet to have a factory supplied primary removable, washable filter.

The unit to be equipped with factory supplied secondary 3M HAF Filter.

The filter access to be from the front of the unit.

- Coil Assembly

Unit to have a factory-built coil comprised of aluminum fins mechanically bonded on copper tubing.

Unit to have minimum of 2 rows of coils.

Unit to have a factory supplied condensate drain pan below the coil.

Unit to be designed for gravity drain.

Unit to have a factory insulated drain hose to handle condensate.

Unit to have provision of 45° flare refrigerant pipe connections

The coil to be factory pressure tested at a minimum of 551 psig.

All refrigerant piping from outdoor unit to indoor unit to be field insulated.

- Condensate Sensor Connection

The unit to include a factory installed condensate sensor connection compatible with the AquaGuard® AG-9300-LG condensate sensor.

- Microprocessor Control

The unit to have a factory installed microprocessor controller capable of performing functions necessary to operate the system.

The unit to be able to communicate with the outdoor unit using a field supplied minimum of 18 AWG, 4-conductor, stranded, shielded or unshielded power/communication cable. If shielded, it must be grounded to chassis at ODU only.

Central control to be available through an optional control board for the outdoor unit.

The unit to be capable of setting Cooling Only operation.

The unit controls to operate the indoor unit using one of the five operating modes:

Auto changeover

Heating

Cooling

Dry

Fan only

- Electrical

The unit electrical power to be as scheduled on the Equipment schedule located on the drawings

The unit to be capable of operating within voltage limits of +/- 10% of the rated voltage.

- Controls

Wired thermostat: Provide unit with wired thermostat.

B.5.5 Accessories

Thermostat: Wired low voltage with subbase to control unit, compressor, and evaporator fan.

Compressor time delay.

24-hour time control of system stop and start.

Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.

Fan-speed selection, including auto setting.

Automatic-reset timer to prevent rapid cycling of compressor.

Electrical Disconnects: Conform to Specified Electrical Spec Section requirements.

Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

Wind baffle

Condensing unit support wall brackets or snow stand if wall brackets are not indicated. – Manufactured and coated with corrosion resistant coating.

B.6 Electric Unit Heaters

B.6.1 Electric Unit Heaters – Standard Type

Assembly: UL listed and labeled assembly with terminal box and cover, and built-in controls.

Heating Elements: Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material or exposed helical coil of nickel-chrome resistance wire with refractory ceramic support bushings, as applicable.

Cabinet: 18 gage steel with easily removed front panel with integral air outlet and inlet grilles.

Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.

Fan: Direct drive propeller type, statically and dynamically balanced, with fan guard.

Motor: Horizontal models with permanently lubricated sleeve bearings; vertical models with grease lubricated ball bearings.

Mounting Bracket: Provide with Universal wall or ceiling bracket.

Control: Provide integral power disconnect switch and remote mounted wired thermostat.

Provide electric unit heaters with capacities as scheduled or indicated on drawings. Acceptable manufacturers to be: Qmark type MUH unit heaters, Markel, or equal.

C Construction

C.1 Piping Systems – Common Requirements

Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

Install piping free of sags and bends.

Install piping to allow application of insulation.

Select system components with pressure rating equal to or greater than system operating pressure.

Sleeves are required for core-drilled holes.

Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

Cut sleeves to length for mounting flush with both surfaces.

Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.

Install sleeves in new walls and slabs as new walls and slabs are constructed.

Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:

Steel Pipe Sleeves: For pipes smaller than NPS 6.

Verify final equipment locations for roughing-in.

C.1.1 Piping Joint Construction

Join pipe and fittings according to the following requirements.

Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

C.1.2 Equipment Installation – Common Requirements.

Install equipment to allow maximum possible headroom unless specific mounting heights are indicated.

Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

Install equipment to allow right-of-way for piping installed at required slope.

C.1.3 Painting
Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

C.2 Identification and Painting - General

Where more than one type of mechanical identification is specified for listed application, selection is installer's option, but provide single selection for each product category.

Degrease and clean surfaces to receive adhesive for identification materials.

C.2.1 HVAC Systems - Labeling and Identifying

Equipment: Install engraved plastic laminate sign or equipment marker on or near each major item of mechanical equipment. Do not label equipment such as cabinet heaters and ceiling fans in occupied spaces.

Lettering Size: Minimum ¼ inch (6 mm) high lettering for name of unit where viewing distance is less than 2 feet (0.6 m), ½ inch (13 mm) high for distances up to 6 feet (1.8 m), and proportionately larger lettering for greater distances. Provide secondary lettering 1/2 to ¾ of size of principal lettering.

Text of Signs: Provide text to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to name of identified unit.

C.4 Refrigeration Piping and Specialties Installation

C.4.1 Preparation

Ream pipe and tube ends. Remove burrs.

Remove scale and dirt on inside and outside before assembly.

Prepare piping connections to equipment with flanges or unions.

C.4.2 Installation

Install refrigeration specialties according to manufacturer's instructions.

Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.

Install piping to conserve building space and not interfere with use of space.

Group piping whenever practical at common elevations and locations. Slope piping one percent in direction of oil return.

Provide non-conducting dielectric connections when joining dissimilar metals.

Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

Provide clearance for installation of insulation and access fittings.

Provide access to concealed fittings.

Where pipe support members are welded to structural building frame, brush clean, and apply one coat of zinc rich primer to welding.

Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting.

Insulate piping per insulation manufacturers recommendations. All insulation exposed to sunlight or installed outdoors to be protected with two coats of WB Armaflex Finish or weather resistant coating.

Fully charge completed system with refrigerant after testing.

Provide refrigerant charging valve connections in liquid line between receiver shut off valve and expansion valve.

C.4.3 Field Quality Control

Test refrigeration system according to ANSI/ASME B31.5.

Pressure test system with dry nitrogen to 200 psig. Perform final tests at 27 inches vacuum and 200 psig using halide torch electronic leak detector. Test to no leakage.

C.5 Ductless Split System A/C Unit Installation

C.5.1 Installation

Install units level and plumb.

Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

Install outdoor-mounted, compressor-condenser components as indicated on the plans.

Connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

Exterior refrigerant tubing insulation to be field coated with UV resistant paint to preserve and protect insulation from UV exposure.

Install condensate piping down inside wall to nearest hub drain. Piping to be minimum ¾" Schedule 40 PVC piping. Plastic tubing will not be accepted.

C.5.2 Connections

Install piping as indicated on drawings and according to manufacturer's recommendations. Provide any accessories as may be required.

Condensate wall penetration to be down low near grade and discharge to be directed to contractor supplied concrete splash block.

Refrigerant piping wall penetration to outdoor unit to be made at the same elevation as the outdoor unit refrigerant piping connections.

Seal all wall penetrations.

Install piping adjacent to unit to allow service and maintenance.

Unless otherwise indicated, connect piping with unions and shutoff valves to allow units to be disconnected without draining piping. Refer to piping system Sections for specific valve and specialty arrangements.

Condensate drain connections to be made with Schedule 40 PVC drain piping.

Connect power and disconnect and Ground Equipment.

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.5.3 Field Quality Control

Installation Inspection: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections, and to prepare a written report of inspection.

Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new components, and retest.

Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C.5.4 Commissioning

Engage a factory-authorized service representative to perform startup service.

Verify that units are installed and connected according to the Contract Documents.

Lubricate bearings, adjust belt tension, and change filters.

C.6 Electric Unit Heater Installation

C.6.1 Examination

Verify that surfaces are ready to receive work and opening dimensions are as instructed by the manufacturer.

Verify that required utilities are available, in proper location, and ready for use.

Beginning of installation means installer accepts existing surfaces.

C.6.2 Installation

Install according to manufacturer's instructions.

Install heaters as indicated.

Hang unit heaters from building structure utilizing mounting brackets. Furnish with heaters. Mount as high as possible to maintain greatest headroom unless otherwise indicated on plans.

Install electric heating equipment including devices furnished by manufacturer but not factory-mounted. Furnish copy of manufacturer's wiring diagram submittal. Verify that electrical wiring installation is according to manufacturer's submittals and installation requirements of Electrical sections.

Wall mounted thermostats to be installed on an insulated base.

D Measurement

The department will measure Operator House HVAC by each house, 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.0060.013	Operator House HVAC	EACH

Payment is full compensation for furnishing and installing new HVAC equipment, supports, piping, pipe insulation, HVAC controls and control devices.

49. Plumbing Systems, Item SPV.0060.014.

A Description

A.1 Work Summary

This special provision describes the demolition of existing plumbing systems and the installation of new plumbing systems. Work required for the project is indicated on the plans and generally summarized as follows below:

Demolition of existing plumbing systems including patching of existing structure penetrations after plumbing system removals

Installation of new Sump pumps, Controls, and clear water sanitary discharge pipe systems.

A.2 Regulatory Requirements

A.2.1 State and Local Codes

Conform to all state and local code requirements.

A.2.2 Standards, Codes and Permits

All work to be installed according to National, State and Local plumbing codes, laws, ordinances and regulations. Comply with all applicable OSHA regulations.

All materials to have a U.L. label where a U.L. standard and/or test exists.

Prepare and submit to all authorities having jurisdiction, for their approval, all applications and working drawings required by them. Secure and pay for all permits and licenses required.

A.3 Delivery, Storage and Handling

Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

A.4 Equipment Accessibility

Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing.

A.5 Submittals

A.5.1 Equipment and Material Shop Drawings

Submit shop drawings which include equipment information and product data for equipment listed below for review:

Sump Pumps and Controls

B Materials

B.1 Common Work Results for Plumbing

B.1.1 Pipe Threads and Fittings

Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

B.1.2 Joining Materials

Solvent Cements for Joining Plastic Piping:

PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

B.3 Valves for Plumbing Systems

B.3.2 Isolation Valves and Check Valves for Sanitary Systems

For piping 2" and less: PVC isolation valves.

B.4 Sanitary Waste Piping – Interior and Exterior

B.4.1 PVC Sanitary Piping

Sanitary waste and vent piping: utilize the following:

PVC Pipe: Schedule 40 ASTM D 2665, solid-wall drain, waste, and vent.

PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.

PVC Special Fittings: ASTM F 409, drainage-pattern tube and tubular fittings with ends as required for application.

Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories for the disabled.

Adhesive: As recommended by insulation material manufacturer.

B.5 Sump Pumps and Controls

B.5.1 Packaged, Submersible, Sump-Pump Units as of make, model and capacity and characteristics along with the controls as indicated and scheduled on the drawings.

B.5.2 Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

Weil Pumps

Liberty Pumps.

Barnes; Crane Pumps and Systems.

Or Equal

B.5.3 Provide pump unit with packaged controls and options as outlined in the equipment schedule. Supply pumps with electrical voltage and phase characteristics as listed. Provide with extended control cables as may be required to route from pump and level control switch to control panel mounting location.

C Construction

C.1 Plumbing – General

C.1.2 Piping Systems - Common Requirements

Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

Install piping as indicated.

Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

Install piping to permit valve servicing.

Install piping free of sags and bends.

Install fittings for changes in direction and branch connections.

Install piping to allow application of insulation.

Select system components with pressure rating equal to or greater than system operating pressure.

C.1.3 Piping Joint Construction

Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly. Follow joining product assembly instructions for PVC pipe and fitting prep and joining together of pipe and fittings.

C.1.4 Piping Connections

Make connections according to the following, unless otherwise indicated:

Install clamped rubber couplings, in PVC sanitary piping NPS 2 (DN 50) and larger, adjacent to valves and final connection to each piece of equipment.

C.1.5 Equipment Installation – Common Requirements

Install equipment and piping to allow maximum possible headroom unless specific mounting heights are indicated.

Install equipment level and plumb, parallel, and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

Install equipment to allow right-of-way for piping installed at required slope.

C.1.5 Plumbing Demolition

Isolate and drain any piping indicated to be removed before the removal process begins. Protect any existing interior systems that may be subject to damage by errand water or physical damage by falling debris caused by demolition activities.

After removal of existing plumbing and piping systems, patch any building wall penetrations. Match existing finishes as part of the patching activities.

Remove from site any demolished materials immediately. Properly dispose of all items.

C.3 Sanitary Waste Piping

C.3.1 Pipe and Fitting Applications.

Provide new piping. Reuse of existing piping will not be allowed.

Install waste piping with a minimum of 2% downward slope in direction of flow.

Pipe joints:

PVC – Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

C.4 Valves for Plumbing – Examination

Examine piping system of compliance with requirements for installation tolerances and other conditions affecting performance.

Proceed with installation only after unsatisfactory conditions have been corrected.

Examine valve interior for cleanliness, freedom from foreign matter, and corrosion.

Examine threads on valve and mating pipe for form and cleanliness.

Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

Do not attempt to repair defective valves; replace with new valves.

C.4.1 Valve Applications

Sanitary Piping: Isolation valves as listed in Section B.

C.4.2 Valve Installation

Install valves at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

Locate valves for easy access and provide separate support where necessary.

Install valves in position to allow full stem or handle movement.

C.4.3 Adjusting

Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs

C.5 Sump Pump System Installation

Examine existing sump location and condition. Verify that sump is clean and ready to accept installation of new sump pump. If sump is not clean, take corrective action and clean sump of dirt and debris before installing unit.

Examine mounting location for control panel. Verify power and control cord lengths needed to reach sump pump location. Adjust control panel location if needed.

Install new sump pump system. Make piping connections. Include isolation valve on the pump discharge. Install clamped on rubber connection between pump and isolation valve to allow for future piping system disconnection. Note: No check valve on pump discharge is to be installed so that pump discharge piping will not capture and contain held water in the vertical discharge pipe above check valve which could be subjected to a freezing condition and could damage the discharge pipe.

Setup level control to maximize pump run time but keep water level below sump upper lip. Water to be allowed to back up into sump trench in counterweight pit to provide additional volume.

D Measurement

The department will measure Plumbing Systems 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.0060.014	Plumbing Systems	EACH

Payment is full compensation for existing plumbing systems demolition and patching, furnishing and installing new plumbing system equipment, piping systems, and supports.

50. Field Verification Survey, Item SPV.0060.015.

A Description

This special provision describes performing a field survey of the existing West Cherry Street Bridge over the Milwaukee River and approach roadways 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 completely 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.

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. Additional personnel with the appropriate skill and background need to perform various other portions of the survey of the bridge's specialty mechanical, structural and/or electrical items requiring verification.

All survey field notes and sketches shall be kept in a neat and orderly fashion so the fabricators 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. 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
- Spacing of girders, diaphragms, floorbeams, sidewalk brackets, and connection plates on fixed and movable spans.
- Length of bascule girders and girders on approach spans.
- All existing beam seat elevations
- All relevant dimensions, clearances, and elevations for the fabrication of new machinery elements and supporting steel.

Location of existing anchor bolts where new anchor bolts are to be installed in close proximity.

The above list is not to be taken as complete or all inclusive. It is presented as an example of the 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 and are to be used in the 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 correcting 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 as a single 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. 0060.015	Field Verification Survey	EACH

Payment is full compensation for conducting the field survey of existing conditions as described herein; for providing clear and concise survey results and for performing any required resurvey or additional survey.

51. Submarine Cable, Item SPV.0060.016.

A Description

This special provision describes furnishing, installing and testing a new electrical service submarine cable and termination cabinets for the Cherry St. Bridge.

The submarine cable system includes the physical cable that crosses the channel, the submarine cable termination cabinets, all mounting hardware and cable supports, and all electrical and mechanical connections to and from the submarine cable termination cabinets.

A.1 Related Provisions

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC Controls - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment

B Materials

B.1 Submarine Cable

Furnish a 600 volt rated power cable. Verify the conductor count of the cable with the vendor of the bridge control system to ensure the specified number of spare conductors is provided. Ascertain the correct continuous length of submarine cable, including sufficient excess length to accommodate pulling eyes, adequate slack for submarine cable settling, cable clamping, connections, testing, and for samples. Ascertain the correct conductor counts (to include spares) based on approved working drawings. In no case can the conductor counts be less than those herein before specified.

Obtain the submarine cable from one manufacturer that is experienced in producing submarine cable of similar types to those described.

B.1.1 Cable Materials

Furnish cable with a weather and UV resistant high-density polyethylene (HPDE) outer jacket with galvanized steel armor conforming to the requirements of ICEA S-95-658 and NEMA WC70. Provide soft annealed copper wire conductors conforming to the requirements of ICEA Publication. Provide Class B concentric stranding conductors. Provide a moisture-resisting, cross-linked, polyethylene compound insulation for each conductor conforming to the requirements of ICEA #S-95-658/NEMA WC70, Part 3.7. Conform the thickness of insulation as given under Column A of Table 3-1 for 2,000 volts rated circuit voltage. Provide mineral filler (not carbon) insulation to inhibit treeing.

Before cable orders are placed with any manufacturer, determine the true length of each cable between the submarine cable terminal cabinets. True length of the submarine cable should include a field coordination of cable routing. Splicing or joining of conductors between these points will not be permitted. Ascertain and order the correct continuous length of submarine cable, including sufficient excess length to accommodate pulling eyes, adequate slack for submarine cable settling, cable clamping, connections, testing, and for samples. Prior to ordering the cable(s), the contractor should verify with suppliers the exact cable dimensions and submit to the engineer for approval.

B.1.2 Conformance

Conform all materials and construction of the submarine cable to the requirements of ICEA Publication #S-95-658/NEMA No. WC70.

Conform all electrical equipment and installations to the requirements of the Standard Specifications for Movable Highway Bridges of the American Association of State Highway and Transportation Officials, except as may be otherwise provided herein. Conform all materials and construction items to the requirements of the Electrical Code of Wisconsin and to any applicable local rules and ordinances.

B.2 Terminal Cabinets

Furnish and install terminal cabinets to provide termination for the submarine cable. Provide adequate size for each to mount all terminal blocks and to provide ample space between blocks for routing of the wires. Size will be determined by the number of conductors in the submarine cable penetrating the enclosure and internal enclosure mounting hardware and available wall space. A drawing showing the proposed termination cabinet size, including all internal components shall be submitted to the engineer for approval prior to ordering the termination cabinet(s).

Provide Stainless Steel type NEMA 4X terminal cabinet enclosures fabricated from No. 10 gauge, Type 316 stainless steel reinforced by steel angles. Install framed overlapping door(s) hung on continuous stainless steel piano hinges to provide access to the equipment inside. Construct the door(s) from No. 10 gauge stainless steel, suitably reinforced with a three-point, vault-type latch and padlock. Provide door(s) with rubber gaskets to prevent water from entering the cabinets. Weld reinforcing plates to the walls where conduits and cable enter the cabinets. Provide each cabinet with drain fittings of the same type as specified for conduit drains under this bid item.

Provide for grounding and bonding of all termination cabinets. Provide grounded vertical stainless steel segregation shield between the power terminal blocks and the control and signal terminal blocks. Extend the segregation shield at a height from the backplate of the terminal cabinet to the inside of the cabinet door. Bolt the shield to the bare metal backplate with stainless steel fasteners and test for proper grounding.

B.3 Hardware

Use a threaded cable support clamp screwed onto the end of the threaded conduit for supporting each submarine cable at the top end of its pier encased conduit run. Provide clamp assemblies that are fabricated of hot dipped galvanized steel and made specifically for this use. Provide stainless steel hardware conforming to the requirements of ASTM Designation A276, Type 316. Provide bolt heads and nuts that are hexagonal and with medium series lock washers.

Secure each jacketed core of each submarine cable entering terminal cabinets at the entrance wall by a wall support hardware or watertight, bronze cable entrance sealing bushing as required. Do not drill a box for more conduits or cable than actually enter it.

Use grommet and or cord grips to seal the cable's entrance into the cabinet.

C Construction

C.1 Submarine Cable

In each cable, provide insulated conductors cabled to a full circular section using non-hygroscopic fillers, where necessary, to fill out the section. Cover each layer of the conductors with a single serving of binder tape. Identify conductors in each layer by coloring or marking the outer surface of the insulation. Apply one (1) layer of binder tape over the cabled conductors followed by a homogeneous synthetic sheath conforming to the requirements of NEMA WC7, Part 4.4.2, Polyethylene, Black. Conform the thickness of the sheath according to the requirements of Table 4-7. Apply cable armor over the sheath consisting of a single layer of galvanized plow steel wire, each wire covered with a layer of polyethylene. Apply a high-density polyethylene jacket over the armor. Conform the polyethylene jacket, jacket thickness, and armor jacket to NEMA WC70 and be sunlight and weather resistant. Submit any variations in cable construction or materials to the engineer for review and approval.

Provide approved non-hygroscopic filler material suitable for submarine cable application, such as jute, in the interstices between and over the insulated conductors to give the complete cable a circular cross-section. Apply binder tape of approved suitable, flame-resistant, and moisture-resistant fabric material with a thickness not less than 10 mils over the multi conductor/filler assembly and overlapped not less than 10 percent of its width between turns.

C.2 Submission of Proposed Method of Installation

Submit, in detail, the proposed method for installing the submarine cable, submarine cable termination cabinets, and all other equipment, and obtain the approval of the engineer before any work is started. Coordinate submarine installation with US Coast Guard and the US Army Corps of Engineers. Obtain approval of those agencies before any work is started.

C.3 Factory Tests of Submarine Cable

Test all cable at the factory according to the test methods of ICEA/NEMA Standards for the types of cable and insulating materials specified and meet or exceed the minimum requirements and criteria for acceptance as set forth therein. Test to demonstrate the quality of the production run prior to assembly and fabrication of the submarine cables, the individual insulated conductors to be incorporated in the cable.

Conform the conductors and insulating compounds to meet the minimum physical and electrical requirements set forth in NEMA Publication No. WC-70. After each multi conductor cable is completely assembled and armored, subject the entire cable to tests for insulation resistance and high voltage. Perform high-voltage tests at the same voltage used on the individual wires and the insulation resistance cannot be less than 80 percent of the original values for the individual wires. Submit the test reports for approval prior to shipping any cable.

Submit to the engineer certified copies of all the factory test data for approval before accepting shipment of cable from the manufacturer. Include, in a tabulated form, the test data, a description of the material undergoing tests, a description of each test performed, the measured or observed results, and the value and limits required by the ICEA/NEMA Standard for acceptance. In addition submit to the engineer copies of a statement certifying that the cable delivered for use under this contract has passed the required factory inspections and tests and complies with all the requirements, including electrical, materials and construction, of the standards and specifications in the contract.

C.4 Submarine Cable Field Testing

Test the submarine cable system as described in the plans and special provisions. Replace and retest at no additional cost to the city any cable or component of the submarine cable system that does not pass the required testing. Testing shall include insulation resistance measurements (meggering). Record readings and submit to engineer.

C.5 Installation

Install new submarine cable across the channel at the location shown on the contract plans. Provide all labor, permits, and equipment sufficient to perform all work necessary to install and place in satisfactory operating condition submarine cables and terminating equipment for carrying the power, control, and ground across the navigable channel. Provide certified diver(s) and equipment necessary to install and inspect physically the cables as required by the engineer. Look for any damage, snags crossed cables and that cable is laying in the trench or is settled below the trench. Verify the cables are covered by nrap.

Under this item, coordinate installation with the engineer, the cable manufacturer, and pertinent Federal, state and local agencies, including, but not limited to, the city, the U.S. Coast Guard, the U.S. Army Corps of Engineers (USACE), and the Wisconsin Department of Natural Resources (WDNR). Install the submarine cables at a depth as required by the U.S. Army Corps of Engineers. Coordinate any channel obstructions with waterway agencies according to all applicable laws, regulations and permits. Install submarine cables according to USACE and WDNR permits.

Make every effort to minimize disruption of the channel bottom. Comply with all requirements of agency permits and approvals.

Route the cable to avoid unforeseen obstructions. Do not exceed the minimum bending radius of each cable at any time before, during, or after installation. Perform the cable installation without damaging the bridge structure or any existing substructure and as directed by the engineer. Exercise proper care so as not to overstress, score, nick, or cut the conductors, insulation, outer jacket or armor, or otherwise damage the cable. During the installation of the cables, arrange to have a representative of the cable manufacturer, experienced in submarine cable handling and installation procedures, on site to provide advice to the contractor and the engineer in these matters.

Take special care to prevent the new cable ends from being damaged or wet during the installation. Provide sealed cable ends from the cable manufacturer. Install all cables per all manufacturer's recommendations. Install cables as shown in the contract plans.

Allow cables to settle for a period of a minimum of 48 hours, after the last cable has been placed, before any rigid connections or attachments are made. Provide submarine cables of sufficient length to allow for slack in settlement and to allow for making permanent connections. Provide proper equipment for lifting or lowering the submarine cables at the abutments/piers. Determine the proper type of lifting or lowering device for the cables, subject to approval by the engineer. Include considerations for the quantity and size of conductors in the submarine cable and distances involved.

D Measurement

The department will measure Submarine Cable 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.0060.016	Submarine Cable	EACH

Payment is full compensation for all work required for installing the submarine cable; for all labor, materials, and equipment needed to perform the underwater installation according to all requirements of WDNR and USACE; furnishing, installing and testing the submarine cable and its termination cabinets; and providing divers and underwater inspection. Payment includes removing any existing riprap that conflicts with installation of the new cable.

52. Temporary Support for Bascule Leaves, Item SPV.0060.017.

A Description

This special provision describes providing temporarily shoring systems for the bascule leaves to enable trunnion and trunnion bearing refurbishment and provide stability of the bascule leaves when in an imbalanced condition due to removal and replacement of any of its components.

B (Vacant)

C Construction

Provide adequate shoring for each bascule leaf prior to removal of any components. Keep in place and maintain the integrity of temporary shoring during any time trunnion bearings are being refurbished, operating and stabilizing machinery is not fully functional, and when bascule leaves are in an unbalance state due to removal and replacement of components before required modifications to counterweights for associated weight changes have been completed.

The suggested temporary shoring arrangements shown on the plans are conceptual. Prepare complete design computations and supporting details for the specific elements of the shoring system proposed, accounting for unbalanced conditions during all stages and proposed sequencing of component removal and replacement work to be performed on the bascule leaves. Prepare and submit fabrication drawings

and erection diagrams for the temporary shoring system. Submit design calculations, prepared by a Professional Engineer licensed in the State of Wisconsin for the shoring system including computation of unbalanced loading conditions based on the proposed sequence of work. Follow the sequence of work upon which the proposed shoring system design and supporting calculations are based during rehabilitation of the bascule leaves. A different sequence may later be followed only if new supporting information for it is prepared and re-submitted for review and re-approved by the engineer.

D Measurement

The department will measure Temporary Shoring for Bascule Leaves 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. 0060.017	Temporary Shoring for Bascule Leaves	EACH

Payment is full compensation for designing, detailing, furnishing and installing temporary shoring of the bascule leaves and removal of the shoring after completion of work.

53. Nameplate, Item SPV.0060.018.

A Description

The work under this item consists of furnishing and installing a new special nameplate on the operator 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 the department prior to casting/fabricating name plate.

B Materials

Provide the new nameplate and rosettes of 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 for the nameplate. Drill holes in substrate. Set anchoring for nameplates per plan.

D Measurement

The department will measure Nameplate by each, 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.0060.018	Nameplate	EACH

Payment is full compensation for furnishing, fabricating and installing a new nameplate as specified.

54. Counterweight Calculations and Span Balancing, Item SPV.0060.019.

A Description

This special provision describes preparing counterweight calculations for span-balance, balancing both bascule leaves, and balance-testing the leaves to ensure compliance with the design criteria listed on the plans and elsewhere herein. Included is all work required to provide the required balance condition for each bascule leaf after completion of all rehabilitation work on them. This includes placing, removing, or adjusting the location of balance blocks.

The work includes performing balance testing prior to removal of existing bridge elements and after completing the bridge rehabilitation (initial and final as described below) using the dynamic strain gauge procedure as described herein, the calculation and documentation of the span balance procedure and methods, measurement of the imbalance moment and determination of the location of the leaf center of gravity a minimum of three times as described below.

B (Vacant)

C Construction

C.1 General

Perform all work according to the AASHTO LRFD Movable Highway Bridge Design Specifications, including interims.

Provide all necessary temporary shoring, supports and/or temporary balance material as required to ensure stability of the bascule leaves during the performing of all rehabilitation work on them. Coordinate work such that the bascule leaves are never in an unbalance condition that may be detrimental in any way to the structure, electrical/mechanical components or the safety of the public and construction personnel.

C.2 Calculations

Prepare balance calculations prior to fabrication and construction based on approved shop drawings and material tests. Submit calculations to the engineer for review and approval. To permit timely and effective reviews of submitted balance calculations by the engineer, prepare them by grouping material and computing subtotals as directed by the engineer. A professional engineer licensed in the State of Wisconsin shall prepare the balance calculations.

Compute the quantity and location of required steel and concrete balance blocks to be added, removed and/or adjusted within the counterweight pockets based on the specified balance requirements and the weight and center of gravity of each bascule leaf. Base balance calculations on actual weights of approved shop details for material to be added to each leaf. Show the weights for new work on the shop drawings for each component. Accurately compute the weight accounting for all material, weld fillets, bolt heads, washers, nuts, paint, galvanizing, normal overruns on plate thickness, etc. Obtain actual scale weights of representative samples of existing major components to be removed and new components to be added to the bascule leaves to most accurately depict these in calculations. This includes existing and new bridge railing, sidewalk systems, steel grid decks, and new galvanized steel members.

Make test batches of lightweight concrete to obtain accurate unit weights in advance of placing the lightweight concrete fill on the steel grid deck. Make test batches also of normal weight concrete that will be used for concrete repairs for the counterweights. Incorporate those test unit weights into the counterweight calculations. Incorporate the distributions of leaf weight in the vertical, horizontal, and transverse directions.

Develop proposed 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 temporary balance material, if used, in the summary tables. Submit all summary tables and back-up materials for review by the engineer.

Prepare a narrative of proposed construction phasing for rehabilitation of the bascule leaves. Include in the narrative a summary of the amount of bascule leaf imbalance during each propose work phase.

Update the balance calculations and summary tables throughout construction and submit to the engineer periodically as required to meet the requirements in 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 of the requirement to make changes to the counterweights and adding or removing additional balance blocks as required to balance each leaf. Submit all changes for approval.

C.3 Making Adjustments to Span Balance

Furnish required number of steel plates and concrete blocks and place them into the counterweight pockets and/or attach them to the counterweight as shown on the plans. An approximate potential number of steel plates and concrete blocks to be placed in each of the counterweight pockets and attached to the counterweight based on assumed and theoretical weights of component's to be added and removed from each bascule leaves is provided in the plans for order of magnitude reference only. Base the actual number of blocks to be added, removed or relocated on span balance calculations and span balance testing.

C.4 Measurement of Span Balance

This item includes measurement of the imbalance moment and determination of the location of the leaf center of gravity a minimum of three times as follows for each leaf:

Pre Rehabilitation – Test the span balance prior to removal of existing bridge elements, to determine the existing balance condition prior to bridge rehabilitation.

Initial – Test the span balance after leaf rehabilitation is completed including added formed concrete to the counterweights and adding balance blocks based on submitted span balance computations, to determine the balance condition and to determine the required additional adjustments by adding or removing more balance blocks. Prior to performing initial balance testing, submit balance calculations and summary tables to the engineer for review. Subsequent to initial balance testing, compute the amount and location of weight adjustments required to achieve the final balance specified in the plans and as described herein and submit the computations to the engineer for review. After the engineer's review, make the approved adjustments.

Final – Test the span balance after balance block adjustments, to determine if the revised imbalance is within the limits specified on the plans and as described herein. Perform leaf operation with the span drive machinery for final balance testing. If the second balance testing indicates that the revised imbalance is not within acceptable limits, perform further balance block adjustments and balance measurements until the criteria specified on the plans and herein are met.

Measure the balance of each leaf of the movable span using the dynamic strain gauging technique. Furnish and install all equipment, materials, instruments, and labor necessary to determine the imbalance by dynamic strain gauging.

Employ the services of an established testing company experienced in dynamic strain gauge measurement of movable bridge balance, subject to approval of the engineer. To demonstrate such experience, identify a minimum of six movable bridges, including at least three bascule bridges, for which the company has provided complete and satisfactory dynamic strain gauge measurements and reporting. Make the measurements under the immediate direction of a professional engineer registered in the State of Wisconsin who has had hands-on-experience measuring movable span balance by the dynamic strain gauge procedure.

Furnish and install the required strain gauges, all cabling and transmission equipment, data acquisition equipment and strip chart recorders, and produce fully documented reports detailing the results of the measurements.

The following applies to the approved testing company: Submit the following items to the engineer for approval:

Description of experimental procedure including type and method of installation of strain gauge rosettes, method of transmission of low level signals, data acquisition equipment and/or strip chart recorders.

Layout of span drive machinery showing proposed location of strain gauges, amplifiers, cable or radio links, data acquisition equipment and all associated cabling.

Details of method of transmission of signals from shafting to data acquisition units.

Elementary wiring diagrams of interconnection of strain gauges, amplifiers, data acquisition equipment, and strip chart recorders.

Sample computations of shaft torque from measured strains, span imbalance, curve fitting and basis for friction correction.

Affix two foil resistance strain gauge rosettes to each of the main pinion shafts, according to the strain gauge manufacturer's installation instructions. Use 2-arm 90-degree rosettes mounted such that the grids are oriented at 45 degrees with the shaft axis and the two rosettes are affixed "back-to-back", spaced 180 degrees apart circumferentially. Connect the gauges such that any bending strains in the shafts will be canceled and torsional shearing strains will be measured on each pinion shaft. Sufficiently clean the areas of the shafts where the gauges are to be mounted to remove all contaminants. On each shaft, mount two rosettes at 180 degrees from each other. Connect the two gauges such that any direct shear forces in the shafts are neglected and true torsional shear is measured.

Connect the strain gauge leads on each shaft to a four-arm amplifier. Transmit signals from the gauges to the data acquisition equipment either through cable links or amplified and then through wireless transmitters.

Connect output leads from each channel of the amplifiers to either a computer-based data logger provided with a two-channel strain gauge module streaming the amplified data to disk at a minimum 1-kHz sample rate, or a five-channel minimum strip chart recorder with at least 250 mm wide chart paper. Provide an inclinometer to provide continuous leaf angle to either the data logging equipment or the strip chart recorder. Utilize step-wise adjustable chart speed and include a setting of at least 250 mm per minute. Use a recorder that is capable of recording data from at least 4 channels if it is equipped with a dedicated event marker or 5 channels if a channel is used to record events.

Record the strains in both shafts simultaneously versus span opening angle during opening and closing to a suitable scale. Record the readings for all shafts at the same strain scale and the chart speed, if a strip chart recorder is used. Make at least 3 opening/closing runs, when the wind speed is less than 5 miles/hour and the bridge deck is visibly dry. Release wind-up torque in the operating machinery prior to each run as verified by space between the faces of the engaged teeth of main pinion and gears.

Numerically convert the strains induced in the shafts to torque by applying fundamental stress-strain relationship calculations for each strain plot for both opening and closing. Use this data to give leaf imbalance versus opening angle, corrected for friction, at each trunnion. Prepare plots of total span imbalance.

Submit five copies of a report documenting the results of the pre rehabilitation and initial strain gauge measurements to the engineer. Separate reports are required for each leaf. Include the following in the reports:

Description of experimental procedure and equipment used.

Span drive diagram showing location at which strain gauges were attached and all applicable gear ratios.

Photocopies of a sample original strip chart for one complete run of each of the three sets in the case of strip chart recordings or data and chart files in Excel format if recorded by a data logger. Annotate with strain scales, angle of opening, significant ordinates, etc.

Description of relationships and sample calculations for obtaining shaft torque from strains, span imbalance from shaft torque, curve fitting and basis for friction correction.

Plots of the following parameters versus degree of opening during each opening/closing run and fitted balance curves corrected for friction:

Total imbalance in foot-pounds for span.

Frictional moment in foot-pounds for span.

Tabulation of imbalance moment at seated position for each leaf/run including the average value for each leaf.

The location of the leaf center of gravity.

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 date of the measurements, weather conditions during measurements and any other information requested by the engineer.

C.4 Bascule Leaf Balance Acceptance Criteria

The final acceptable balance condition measured by the procedures described herein will be considered acceptable when both of the following conditions are met:

There is a downward reaction at the tip of each bascule leaf (tip heavy) when in the closed position of no less than 1,000 pounds and no greater than 2,000 pounds.

The composite center of gravity of each bascule leaf including its counterweight is between negative 20 degrees and positive 15 degrees from a horizontal line extending from the center of trunnions.

D Measurement

The department will measure Counterweight Calculations and Span Balancing 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.0060.019	Counterweight Calculations and Span Balancing	EACH

Payment is full compensation for all analyses, testing, professional engineer services and all other balance work described herein or shown on the plans; and transporting installing, removing and/or adjusting the location of balance blocks or plates as many times as necessary to achieve final balance.

55. Timber Fender Removal, Item SPV.0060.020.

A Description

This special provision describes removing the timber walers located on the bascule piers and abutments as shown in the plans and specified herein.

B (Vacant)

C Construction

Cut existing waler anchors 2-inches beneath the pier concrete surface and patch with repair as required. Concrete repairs shall utilize methods as described in Standard Specifications for Concrete Surface Repair.

D Measurement

The department will measure Timber Fender Removal 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.0060.020	Timber Fender Removal	EACH

Payment is full compensation for removal, and disposal of all removed items.

56. Fender Pier Repairs, Item SPV.0060.021.

A Description

This special provision describes modifying and repairing the upper portion of the circular fender piers located at both front corners of both bascule piers as shown in the plans and specified herein.

B Materials

Rubber bumpers shall be manufactured from black rubber. The rubber shall conform to the requirements of ASTM D2000 and of the designation code recommended by the manufacturer for the intended usage. Rubber bumpers shall be as manufactured by Uniroyal, Inc., Goodyear; General Tire; Lord Corp.; or an approved equal. Rubber bumpers shall be of the size indicated on the plans and have a continuous hole through the center to accommodate the supporting chains.

The wire rope for wrapping the existing timber piles shall be 3/4-inch diameter 6 x 19 IWRC, regular lay, improved plow steel galvanized wire rope with a minimum breaking strength of 48 kips. Cable clips shall be forged steel saddles and steel U-bolts.

All hardware, and fittings for the Pier Fender modifications shall be hot dip galvanized according to ASTM A153.

C Construction

Cut off timber piles surrounding the fender piers at the elevations shown in the plans taking care not to damage the remaining portions. Band the piles tightly together using an existing steel rubbing bar in addition to new galvanized wire rope.

Use underwater construction methods as necessary or provide a temporary dewatering system for performing timber pile cutoffs and for installing the lower portion of replacement or relocated elements.

After rubbing bars are lowered and the cable loops installed, perform adjustments to make them uniformly taut as directed by the engineer.

D Measurement

The department will measure Fender Pier Repairs by each, 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.0090.021	Fender Pier Repairs	EACH

Payment is full compensation for all repair work, including removing and disposing of existing portions removed.

57. Span Drive Machinery Refurbishment, Item SPV.0060.022.

A Description

This special provision covers all apparatus, material and labor required to properly detail, manufacture, ship, install, adjust, test, paint and put into approved working order all parts of the specified bascule span drive machinery. Furnish, at no extra cost, any device, material, labor or effort not herein specified, yet required to complete or perfect the equipment in a manner suitable to the department.

Machinery and components to be removed includes, but is not limited to:

- Two reducers per bascule leaf (four total).
- Two main electric motors per bascule leaf (four total).
- Two shaft and coupling systems per bascule leaf (four total).
- Two motor brakes and two machinery brakes per bascule leaf (four total).

Main drive pinion gear guards – one for each main pinion and rack (four total).

Machinery and components to be refurbished include:

- Two Rack and Pinion sets per bascule leaf (four sets total).
- Two Bull gear and pinion sets per bascule leaf (four sets total).

Bearings, supports and shafting associated with the above two gear sets per bascule leaf.

New span drive machinery to be furnished and installed includes, but is not limited to:

- Two motor brakes and two machinery brakes per bascule leaf (four total).
- One primary reducer per bascule leaf (two total).
- Couplings, bearings, shafts connecting new primary reducers to existing gear sets.
- Support weldments for new machinery.

Main drive pinion gear guards – two per bascule leaf.

The contract documents are diagrammatic in showing certain physical relationships which must be arranged within the mechanical work, that will interface with other work including electrical work. Coordinate mechanical work with electrical and structural work as well as closures and restrictions to vehicular and navigational traffic. Schedule and arrange mechanical work in a neat, well organized manner.

B Materials

Materials used to fabricate the new span drive components shall be as shown on the contract documents and as specified in Bridge Machinery – General provisions.

Fabricate weldments for support of machinery from structural steel of the type and grade specified in the plans. Where the type and grade of steel is not specified in the plans, fabricate weldments from ASTM A709, Grade 50 structural steel. Use of steel plate larger than that denoted in the plans may be required to obtain the final required dimensions.

Galvanize and paint components as indicated in the plans.

C Construction

C.1 General

Remove existing span drive machinery with care and not to damage existing bridge components or the components to be refurbished.

Standard spec 506.3 of the WisDOT Standard Specification applies to this item. Construct according to the requirements defined herein and, in the plans, and the provisions of the AASHTO Movable Specifications. Where a conflict exists between documents, the requirements of the plans and specifications will govern over those of the AASHTO Movable Specifications.

Span drive machinery must be set, aligned and verified by experienced millwrights. The millwright foreman must have a minimum 10 years of experience in setting and aligning heavy machinery. Prior to installation submit to the engineer for review the qualifications of the millwright foreman and other proposed millwrights performing the work.

C.2 Setting of Span Drive Machinery

Unless otherwise specified or shown in the plans, position span drive machinery within the following tolerances:

Horizontal position:	1/32 in.
Vertical position:	1/32 in.
Orientation (parallel to Plan centerline):	0.5 degrees

C.3 Startup Requirements

Implement startup procedures that protect the equipment from damage and ensure safe working conditions during bridge operations throughout construction.

C.4 Protection of Equipment

During construction, all equipment must be protected from damage as a result of construction operations and contamination from dust and debris. Should any equipment become contaminated, immediately clean the equipment, re-lubricate, and protect from further contamination. The center lock must not be operated and no enclosed equipment opened during any period in which construction operations can contaminate the equipment.

C.5 Erection

Erect and assemble span lock machinery according to part numbers and match marks. Adjust all parts for precise alignment by means of shims and pull parts tightly against supporting members by use of clamps, temporary bolts, or other approved means before drilling and reaming holes for connecting bolts. Install drive machinery within the specified tolerances and such that satisfactory operation is achieved. Utilize millwrights with demonstrated skill in this type work for all erection and adjustment of span drive machinery.

Unless approved by the engineer prior to construction, drill bolt holes in structural steel supports only after alignment of drive machinery. Do not install machinery components unless mounting surfaces are clean of dirt, paint and other foreign materials. Securely tighten connecting fasteners and nuts to the specified torque values.

C.6 Span Drive Machinery Components

C.6.1 Open Gears

Clean and re-lubricate all Gear Sets. Hand-tool remove any plastic deformation rolled to the edges of the gear teeth. Solvent clean and remove all old lubricant and debris.

Tooth Contact - Align gears so that the gear tooth makes contact with the mating pinion tooth over a minimum of the center 80 percent of the tooth width. This criterion must be satisfied by 80 percent of the gear and pinion teeth. Up to 20 percent of the remaining gear teeth may have less than 80 percent contact but no less than 65 percent contact. Check and demonstrate tooth contact for normal operation condition when operating the bridge with machinery.

Backlash - Set backlash within the tolerances established by AGMA for spur gears, based upon center-to-center distances and tooth pitch, unless otherwise specifically defined in the Plans.

Take pictures and numerically record all open gearing contact BEFORE and AFTER bearing bushings and fasteners replacement. Open gearing contact ratio shall not be worse than before gear train components replacement.

Painting of the Gear Train shall be considered incidental to the work. Do not paint the contact surfaces of gear teeth.

If required, the open gear lubricant utilized must bond strongly to gear teeth to maintain a continuous film on bearing surfaces despite high loading and high load repetition, contain an EP (Extreme Pressure) additive, repel water, resist throw-off and dripping, maintain consistency over wide temperature variations, and allow for ease in application and removal. The lubricant must have an operating range of 0°F to 210°F and must be considered a heavy bodied, adhesive type open gear lubricant by its reputable lubricant manufacturer. Some adhesive lubricants are available in a diluted form for ease of application. This type of lubricant is diluted with solvent that quickly evaporates after application leaving behind an adhesive tacky film. If such a lubricant is desired, the solvent must be non-flammable and the mixture must not pose any hazard to health. The detailed specifications for open gear lubricants that will satisfy the above requirements do vary. Use unleaded, non-diluent type, non-chlorinated open gear grease, SUS 7,000 @ 100°F viscosity, water resistant, anti-wear/extreme pressure.

C.6.2 Reconditioning Racks

The four existing racks are to remain and be reconditioned in place.

After removing the rack pinion shafts, thoroughly clean the racks and remove all corrosion, debris and old accumulated grease. Accomplish this on the tooth surfaces by using suitable solvents. Sand or grit blasting of the teeth is not acceptable. After cleaning, manually dress the teeth, and remove all burrs, upset metal, fins and plastic flow over the tooth ends and tips. Exercise extreme caution while performing this work as it is to be accomplished with no measurable removal of metal from the tooth faces or alteration of the present tooth profile. The use of fine emery paper or such mediums as "Scotch-Brite" is suggested.

Visually inspect the racks for indications of cracks or other flaws that may contribute to improper operation or failure of the racks in future service. Direct particular attention to the root fillets of the teeth. Report any indications to the engineer. Conduct further investigation using dye penetrant or other acceptable inspection procedures to evaluate the flaws and determine proper corrective action.

Inspect all bolted and riveted connections of the rack and spider assembly to the bascule girder for tightness and integrity. Report to the engineer any bolts that have failed and others that require replacement. Replace defective bolts. It is estimated that 12 bolts per rack (48 total) will require replacement. Following the reconditioning, coat the rack teeth, and other finished surfaces, with a rust inhibitor.

C.6.3 Enclosed Gear Reducer

C.6.3.1 Requirements

The following requirements apply to all gear boxes in the leaf operating machinery gear train.

For the manufacture and installation of the gear boxes, employ a manufacturer with at least 10 years' experience in the design, fabrication, testing, installation and startup of gear boxes for movable bridge systems of comparable size and type. The engineer may send an inspector to witness shop testing and to verify compliance of the reducer and its components, prior to shipment of the reducers to the field. Provide all gear boxes from a single manufacturer (except planetary reducers), with sizes, ratios and construction details as shown on the Plans.

Provide gear boxes that conform to the current edition of ANSI/AGMA 6013.

Provide ANSI/AGMA 2001-D04 Grade 2 material, as a minimum, for gearing and shafting. Provide results of mechanical testing of materials. Perform all inspection and testing recommended by AGMA 923-B05 to demonstrate compliance with metallurgical specifications of the selected material grade.

Provide gear boxes with the ratings shown on the Plans. Provide gear boxes that withstand an intermittent load equal to 2.75 times the rated full load torque of the driving motor(s) when referred to the input to the reducer, without any component reaching 75 percent of its yield strength. Ratios shown in the Plans are for general configuration. Final ratios shall be determined by the reducer manufacturer. Final drive train ratio (primary and secondary ratio) shall not deviate from that shown in the Plans by greater than +/- 5%.

Provide helical or herringbone gearing, Spur gears are not acceptable. Bevel gears are required for the differential gearing and auxiliary input shaft gearing. All gears are to be through hardened steel, and shall conform to the current specifications of ANSI/AGMA 2015-1, Accuracy Class A8 or better.

Provide pinions integrally cut on the pinion shafts with the material conforming to AGMA Grade 1, as a minimum. Proportion the pinions to have a root diameter larger than the diameter of the journals for the pinion shaft. The relative hardness of gears and driving pinions is to be such that the loading and testing requirements of these Specifications are met. Provide pinions with a minimum hardness of 320 Brinell. Provide gears of a minimum 265 Brinell hardness.

Use shafts made from alloy steel, heat treated and annealed as required. Provide radii at fillets in keyways. Provide keys and keyways per ANSI B 17.1 Class 2. Include key and keyway dimensions on shop drawings.

Provide anti-friction type bearings with an ABMA L-10 life of 40,000 hours at the rated speed and horsepower, and a service factor of one.

Provide housings of welded steel construction, or heavy duty cast steel, and duly stress relieved. Provide dowel pins at all parting seams for accurate gear and bearing alignment.

Provide large rugged lifting lugs for each housing section. Provide removable inspection covers on the housings to facilitate viewing of all the gearing (except differential gears) and meeting all requirements detailed herein. Extend the reducer bases sufficiently past the body of the reducers to allow for drilling and reaming of the mounting bolt holes, and for bolt installation from above the base. Provide a minimum edge distance of 1.35 times the bolt diameter, to the centerline of the mounting bolt on the mounting pad. Provide adequate thickness and width at the base to reduce the stress on mounting bolts. Provide clearances for hydraulically tensioning the reducer support anchor bolts. Clean by sandblasting the inside of housings prior to assembly and protect from rusting. Equip the gear boxes with a means for filling and draining; provide shut-off valves for the drains. For observing the lubricant level in the gear box, provide both a dipstick and a sight level gauge.

In all cases where the design standards for gear boxes or the Specifications are in conflict with another, design for the more conservative standard.

Manufacture reducers according to the requirements of AASHTO LRFD Movable Highway Bridge Design Specifications, and provide the following information on the nameplate:

- Serial Number
- Manufacturer's name and address
- Type, model and size of gear box
- Gear reduction ratio
- Service power rating
- High speed shaft rpm
- Service factor
- Lubrication specification, viscosity in SSU
- AGMA symbol and Gear Accuracy Class

Attach name plate at reducer manufacturer facility. Provide automatic lubrication of the gears and bearings when the unit is in operation, using a bath lubrication system. All components in the gear box, which require lubrication, shall be partially submerged in an oil bath. Use a splash lubrication system only when the configuration of gears and bearings prevent bath lubrication. Splash lubrication systems must continuously lubricate all gears and bearings properly, when the unit is in operation. Design splash lubrication systems such that equal lubrication is supplied to each internal component for both directions of operation. Oil feed troughs may be used to supply oil to bearings and gears, which are above the bath. Provide lubricant meeting viscosity and other requirements of ANSI/AGMA 9005-E02, Industrial Gear Lubrication. Do not use pressurized lubrication systems for gear boxes unless specifically approved by the engineer or specified in the Contract Documents. When a pressurized lubrication system is required for the reducer, provide a redundant lubrication system so that both systems operate concurrently. Provide a contact for remote alarm indication in case of a lubrication system malfunction.

Provide inspection covers on reducers for inspection of all gears, bearings and other internal devices. Locate covers on the side above the oil level, if practicable, so that oil draining is not required for inspection. If covers are located below oil level, engrave on the cover "Drain oil before removing cover." Size the access covers such that minor repairs could be made to reducers without requiring housing

disassembly. Provide the inspection cover with seals that do not require replacement when access covers are opened. Provide handles on the cover.

Provide breathers that are water barrier type with an indicator to show the moisture state. Locate breathers above the maximum oil levels in all positions of the reducer during operation, and its piping entering the unit at the highest point possible. Breathers shall not be mounted in bearing caps.

Mount oil level indicators in locations that can be easily viewed by maintenance crews. Provide a graduated sight gauge. Vent the indicator back to the case. Provide sight gauges of rugged construction, and protected against breakage.

Locate oil drains, fitted with a stainless steel ball valve with a pressure-temperature rating of 200 psig and 200° F, at the lowest point possible. Provide a plug on the open end of the valve. Provide a hand-operated lever for the drain that can be locked in the closed position.

Provide two oil sampling cocks, one located at the lowest level of oil and one just below the upper oil level, in accessible positions on the reducers.

Design gear boxes to accommodate oil expansion due to churning and temperature change.

Locate grease fittings for grease lubricated bearings at readily accessible locations.

Provide internal seals between the bearing housing and the gear oil to prevent interaction between grease and oil.

Provide bearing shaft ring seals of the mechanical type, dual lip, spring-loaded oil seals that compensate for wear. For custom build boxes provide two lip seals separated by grease cavity. Both lips should be facing inward. Provide grease vent and seal cover plate for seal protection.

Reducer foundations shall extend past the body of the reducers to allow for mounting bolt hole reaming and bolt installation from above the unit

Provide shaft extensions of the arrangement, lengths, and diameters, if shown in the Plans.

Assemble hubs of gear couplings on the shafts, with a shrink fit, in the shop.

All seals covers and keepers shall be stainless steel AISI 316 or similar. All bolts, nuts and washers shall be hot dip galvanized per ASTM A153 or ASTM F2329. Nuts must meet supplemental requirement S1 and S2 per ASTM A563.

All input and output shafts shall be hard chrome plated (with an undercoat of electrodeposited nickel) from the area of a contact with seals up to the end of the shaft.

The coupling seats could be chrome plated or left uncoated per manufacturer recommendation. Surface preparation and hard chrome plating shall conform to QQC-320, Class 2E specification with an undercoat of electrodeposited nickel. Grind chrome plated shafts in the area of seal contact or where required by manufacturer. Provide final chrome thickness not less than 0.002 inches over an undercoat of electrodeposited nickel in thickness not less than 0.001 inch.

Factory-finish the gear boxes (external surfaces only) with thermal sprayed metalizing per Paints and Protective Coatings of Structural Steel of this Special Provisions. Paint for painting the interior of gear housings shall be special oil-resistant crankcase paint.

C.6.3.2 Shop Drawings

Provide the reducer design calculations and drawings to the engineer for approval before the fabrication of the unit.

Submit shop drawings showing interface with other equipment, and including the following:

- Main drive gear boxes with bill of materials,
- Ratios, dimensions, construction details, and AGMA ratings,
- Installation, Operation and Maintenance Manual sheets,
- Operational experience record for model supplied,
- Product data for all components,
- Certified test data for all factory tests and As-Built Plans,

Calculations including AGMA ratings for gear sets, bearing ratings, and shaft sizing.

Submit a certified print of each gear box drawing, showing:

- All external mounting dimensions including shaft sizes, bores, and keyways,
- Ratings that will appear on the nameplate,
- Location of all lubricant connections,
- Lubrication recommendations,

Section views, with part numbers for each component.

Show all steel designations, AWS welding symbols, and net weld lengths. Submit product data for all bearings.

Submit manufacturer's installation instructions, operation and maintenance data.

Submit results of weld testing and shop full load testing of reducer(s).

C6.3.3 Shop Testing and Inspection

- Ensure the following information is provided:
- NDT documentation for ultrasonic or radiographic testing all welds for all gearing components,
- Test reports for materials used in the manufacture of the gears and pinions,
- Heat treatment documentation for through hardening of the gears and pinions,
- Hardness quality control documentation,
- Lead, profile, spacing, and run-out measurements for gears and pinions,
- Summary computer printout of calculations for all gear/pinion sets,
- Specific design criteria for the gear box; i.e., material requirements on the housing, gears, pinions, shafts, bearings, seals, lubrication, factory finish, etc.

Provide two weeks' notice to the engineer on the reducer testing schedule.

Secure the reducer to rigidly fix its position during all testing.

Provide temporary couplings for the reducer testing that are capable of operation at reducer test torque. Secure couplings to shafts using temporary keys and at least an FN1 shrink fit. These tests shall be run with the reducer filled to the dip-stick marked with new oil of the viscosity the manufacturer recommends on her/his lubrication chart for normal operation.

After testing and before field installation, drain and replace with new oil.

Immediately before the start of the test, and at half-hour intervals thereafter, the following measurements shall be made and recorded and the records shall be submitted with the Certificate of Compliance:

- Temperature of ambient air.
- Temperature of oil near bottom of crankcase.
- Surface temperature of each shaft extension adjacent to shaft seal.
- Sound levels at points above and at 3 feet distant from the unit. Record maximum sound level after measuring all around the reducer.

The temperature of the oil near bottom of crankcase shall not rise more than 40 degrees F from ambient during this test and no shaft shall experience a temperature rise of more than 60 degrees F from the ambient. Planetary reducer manufacturer shall specify maximum test temperatures for specific points of the reducer and also criteria for rejection. The temperatures during tests shall not rise above what is specified by the manufacturer.

The noise level of the reducer shall not exceed 90db with the microphone held 3 feet from any point of the reducer housing.

During testing each speed reducer shall be checked for unusual noise (thumping or any non-uniformity), excessive bearing clearance, and any other unusual operating characteristics. The units shall operate smoothly, and without excessive vibration or temperature rise. All malfunctions shall be recorded and corrected, and the units retested, if necessary, before release from the manufacturer's shop. After the unit has passed the test, a Certificate of Compliance shall be submitted by the contractor to the engineer.

The proper operation of the lubricating system shall be demonstrated during the shop test.

Before the load test, demonstrate all initial gear contact by applying yellow compound to the gear teeth and hand rotating the input shaft. After the load test, demonstrate contact of all teeth through application of Prussian blue or red. Provide documentation of the teeth contact. In addition to the test specified above, the proper distribution of load on the gear teeth shall be demonstrated by the tooth contact tape applied to each gear and these tapes shall be preserved in the records to be submitted with the Certificate of Compliance.

No Load Spin Test

After assembly of the reducer, conduct a no load spin test at 115 percent of rated speed for one hour in each direction. All reducer testing is to be performed at one location. Block out noise coming from other equipment of the test stand with sound shields if the sound level readings taken at 2 feet from the test equipment surface exceeds 80 dBA.

Sound level readings, taken at 3 feet from the reducer surface, shall not exceed 85 dB with the unit running at 115 percent of the rated speed. Closely monitor the reducer during the spin test for oil leaks, excessive heating of bearings, excessive vibrations, and any other abnormalities. If noise exceeds the specified limits, leaks are noted, bearing temperature exceeds the Manufacturer's recommendations, atypical vibrations or sounds are evident without instrumentation, or other abnormalities are evident during testing, the unit shall be corrected and retested.

Run 150% FLT Test

Following the no load spin test, run gear boxes at rated speed at 150% of full load motor torque for ninety minutes in each direction. Monitor the reducer for oil leaks, excessive heating of bearings, excessive vibration, and any other abnormalities. Record bearing and oil sump temperatures every 15 minutes.

Sound level readings, taken at 3 feet from the reducer surface, shall not exceed 90 dB with the unit running at 100 percent of the rated speed. Closely monitor the reducer during the spin test for oil leaks, excessive heating of bearings, excessive vibrations, and any other abnormalities. If noise exceeds the specified limits, leaks are noted, bearing temperature exceeds the Manufacturer's recommendations, atypical vibrations or sounds are evident without instrumentation, or other abnormalities are evident during testing, the unit shall be corrected and retested.

Run 200% FLT Test

Run a load test with the gear box loaded to 200 percent of the full load motor torque, at rated speed, for 10 revolutions of the output shaft in each direction.

At the end of these tests, remove inspection covers and examine all gear teeth for excessive wear and damage. Examine gear teeth for contact patterns. Take pictures of all examined components and provide to the engineer for review. A minimum of 85 percent tooth face contact must be evident. Any relative movement between two fixed mating components of a magnitude which cannot be explained through accepted engineering principles will be cause to require adjustment and retesting. All out of tolerance parts shall be replaced and adjustments made. Any discrepancies, including behavior which is consistently different from the other reducers, shall be corrected and the reducer shall be retested until all criteria are met. Retesting will be done at a load required to demonstrate that the defect is corrected. Provide a recommended retest procedure to the engineer for review and approval. The engineer reserves the right to require additional no-load, 150%-load, or 200% full-load testing at no additional cost until the reducers demonstrate full compliance.

After re-assembly of the gear box and acceptance by the engineer, if no material modifications are required, run the unit at 100 percent full speed at no load for 30 minutes in each direction and monitor for abnormal changes in operating conditions. If material modifications were required following the initial load test, perform additional load tests up to and including the 200 percent full load test as required by the engineer at no additional compensation.

Conduct all required non-destructive testing of the gear boxes in the manufacturer's shop, and closely inspect the gear box for any oil leaks, and repair if necessary.

Remove temporary couplings and shaft keys used for the reducer test and install permanent couplings and keys as specified in the Plans.

Prior to shipping, clean the reducer of dirt, chips, grit, and all other injurious materials and apply the applicable rust-inhibiting preservative. Coat exterior finished metal surfaces and unpainted metal surfaces as soon as practicable after finishing with rust-inhibiting preservative. Coat the surfaces and components inside the reducers with a Manufacturer approved winterizing, rust-inhibiting compound. Remove these coatings from all surfaces prior to erection, final painting, and operation. Tag, bag, and crate mounting hardware and accessories for shipment and storage with the reducer. Mount assembled units on skids and crate for protection during handling, shipment, and storage.

Protect reducers from weather, dirt, and all other injurious condition during manufacture, shipment, and storage, including storage at the site if applicable. Store reducers indoors. During reducer storage, provide maintenance to seals, bearings, and other components as required by the manufacturer.

C6.4 Brakes

C6.4.1 Material

The motor brakes shall function to stop the bascule leaf under emergency stops and to hold the leaf stationary against wind and unbalance loads. During normal operation the span drive will stop the leaf and provide all necessary dynamic braking and control. Machinery brakes function primarily to hold the leaf against high wind loads. The machinery brakes also function to assist in stopping the bascule leaf under emergency stops should the motor brakes alone fail to do so. Brake application times shall be set and adjusted such that under an emergency stop in low wind conditions (equal to or less than AASHTO "Condition A") the machinery brakes do not engage until after the motor brakes have fully set and stopped the leaf.

Motor and machinery brakes shall be 208 VAC, three-phase, 60 Hz, spring applied electro-hydraulic released thruster type drum and shoe brake, mill duty brakes as manufactured by the following or approved equal:

Mondel Engineering	Johnson Industries, Ltd.	Hindon Corp.	Gemco / Ametek
2610 Dunwin Dr. Mississauga, Ontario Canada L5L 1J5 (905) 828-1526	108 Skyway Ave. Toronto, Ontario Canada M9W 4Y9 (416) 213-9991	2055 Bee's Ferry Rd. Charleston, SC 29414 (803) 763-6616	1725 Western Drive West Chicago, IL 60185 (630) 231-5900

If no torque is shown in the Plans, the brake shall produce a torque equal to or up to 10 percent greater than the maximum torque of the existing brake. Where required in the Plans, brakes shall be AISE rated. Thruster and drum sizes are to be rated for the torque requirements specified in the Plans and components shall meet the following:

Brake actuators shall be cast in aluminum alloy and fitted with double shaft seals, waterproof, and dustproof IP65/NEMA 4 utilizing a TENV, three-phase, squirrel cage motor. Actuator design shall be independent of direction of motor rotation. The brake actuator shall be supplied with fluid suitable for ambient temperature range from -35°C to +60°C (-30°F to +140°F). The actuator shall be fitted with an integral time delay valve for adjusting the brake setting times. The valve setting shall be fully adjustable during brake operation.

Brake torque springs shall be external torque springs, infinitely adjustable down to 40 percent of full rated torque, or internal springs adjustable down to 60 percent of full rated torque, as specified in the Plans, and shall be fully enclosed with calibrated torque and range of torque indicator. All brake arm pivot points shall be fitted with low maintenance bushings that do not require periodic lubrication. Mating pins shall be manufactured from corrosion resistant materials with self-locking washers that do not require cotter pins or hitch pins.

Brake adjustments shall be provided for self-adjustment for lining wear to sense the need for adjustment every time the brake sets and to make correction the next time the brake releases. Brake adjustments shall be resistant to externally caused vibration. Auto-equalization shall be provided such that when the brake releases, the running shoe clearance is automatically equalized and maintained. Brake adjustments shall be located to be immune to accumulated dust and be easily serviced.

Provide a latching hand release for manual release of the brake without power. The manual release shall be designed as a fixed component not requiring removable levers or wrenches and shall be accessible from outside the brake enclosure.

Electro-mechanical, lever-operated, brake mounted limit switches shall be provided for indication of brake released, brake set and brake manually released. Three independent limit switches with two N.O./N.C. contacts per switch rated for 120 VAC shall be utilized. Limit switches shall meet the requirements of the Bridge Electrical Work Specification.

Aluminum, NEMA 3R enclosures arranged to lift off for inspection shall be provided. Include provisions to access and operate manual hand release mechanism from outside the enclosure.

Brake shoes shall be self-centering and shall be easily replaced from either side of the brake frame without disassembling the top brake connecting rod or pull rod, and without disturbing the torque adjustments. Brake pads shall be copper ceramic.

All steel components shall be nitrided for corrosion protection and resistance to wear, scuffing and fatigue before surface painting. The process documentation shall be submitted to the engineer.

Brake wheels shall be manufactured from ASTM A536 grade 65-45-12 ductile iron or equivalent strength and ductility, with diameters matching the requirements shown in the Plans. The bore and keyway shall be machined to the fit with the mating shaft and finish shown in the Plans or according to the Manufacturer's recommendations if not indicated.

C6.4.2 Construction

Brakes shall be installed and aligned according to all Manufacturer's installation instructions and alignment tolerances. Bedding (seating or burn-in) of the shoes shall be performed according to the Manufacturer's instructions prior to operation of the bridge machinery. Where these instructions are not provided by the Manufacturer, the following shall apply:

The brake shoes shall be centered across the brake wheel, eliminating any ridge formations.

The actuator shall have a reserve stroke of 13 mm (1/2") when the brake shoes are fully seated and full torque is being applied.

The brake assembly shall be square and aligned to the brake wheel within a maximum of 0.80 mm (1/32"), in all three axes.

Running clearance between the brake wheel and the shoes shall not exceed 0.64 mm (0.025").

Torque setting and setting delay shall be adjusted prior to operating the machinery or attempting to hold a leaf in the raised position with the brakes.

C6.5 Motor Brakewheel Couplings

Flexible couplings shall be grid-type; self-aligning, fully flexible, torsionally flexible couplings intended to connect electric motors to machinery components. Grid-type couplings shall have steel hubs, alloy steel grids, and steel or aluminum covers. Bolts in the covers shall be shrouded. Motor couplings shall meet the requirements of Sub-article 6.7.9.3 of the AASHTO Movable Specifications. Couplings shall be a standard product of an established Manufacturer. Provision shall be made for introducing lubricant to all contact surfaces.

C6.6 Flexible Couplings

Finish boring and cutting of keyways in couplings shall be done by the coupling Manufacturer or the Manufacturer's designee to limits specified on the Shop Drawings. Ship finished couplings to the proper location for installation on shafts by the Manufacturer of the connected component. Install coupling halves on reducer shafts and other shafts as per the coupling Manufacturer's installation instructions. Coupling-shaft fits shall conform to H7/s6 (FN2) fit, unless otherwise noted in the Contract Documents. Manufacturer recommended coupling alignment tolerances apply. Flexible couplings shall meet the requirements of Sub-article 6.7.9.3 of the AASHTO Movable Specifications. Couplings shall be a standard product of an established Manufacturer. Provision shall be made for introducing lubricant to all contact surfaces.

C6.7 Shafts

- Provide forged shafts, including those having integral flanges or pinions, homogeneous and reduced to size from a single bloom or ingot at no less than red heat. Ensure the blooms or ingots have a cross sectional area at least three times that required after finishing and that the finished product is free of injurious flaws such as seams, pipes, or cracks. Report hot rolling reduction ratio. Provide forged shafts over 8 inches in diameter with a hole bored lengthwise through the center, about 1/5 the diameter of the shaft.

- Test shafting materials for mechanical properties and furnish certificates to the city. Evaluate mechanical properties according to the test methods and definitions of ASTM A 370. Ensure that finished shafts are free of camber and will run without vibration, noise or chatter at all speeds up to and including 120 percent of design speed. Provide all shafts and pins with accurate finishes. Ensure they are round, true, smooth and straight, and have round fillets and shoulders. Provide ample radii at fillets. Blend in all fillets and shoulders smoothly to the adjacent surfaces, without tool marks or scratches. Unless otherwise required herein or on the Plans to have a finer finish, ensure the surfaces have a maximum ANSI roughness average of 16 micro-inches.
- Furnish shafts conforming to tolerances in ASTM A29, unless otherwise indicated. Ensure that straightness tolerances for turned, ground and polished shafting do not exceed 0.002 inch per foot for shafts, up to and including 1 1/2 inch in diameter, and 0.003 inch per foot for shafts over 1 1/2 inch in diameter. At any measuring position when the part is rotated 360 degrees about the datum axis, with the indicator fixed in a position normal to the true geometric shape, the circular runout tolerance of shafts shall not exceed 0.020 inch FIM (Full Indicator Movement), and pins not exceed 0.004 inch FIM. Unless otherwise required herein or in the Plans to have a finer finish, the non-mated surfaces shall have maximum roughness of 125 micro inches.
- Provide each end of all shafts, when finished to the required lengths, with a 60 degree lathe center, with clearance hole, at the exact center of the shaft. Prepare the ends of shafts that are bored with an inspection hole for the attachment of a centering device equivalent to the lathe center. Furnish all such devices as part of the work.
- Rolled material is acceptable for shafting and pins up to 4 inches in diameter. Test all cold-finished shafting for its mechanical properties and furnish a test certificate to the engineer. Ensure that cold-finished shafts are free from camber and run without vibration, noise, or chatter at all speeds up to and including 120 percent of design speed. Ensure all hubs mounted on the ends of cold-finished shafts have the fit specified herein or on the Plans. To obtain the required fit between hub and shaft, furnish the cold-finished shaft 0.060 inch larger than the nominal diameter specified and turn the ends to the required dimension for the hub. Furnishing any cold-finished shaft of one diameter end to end is permitted provided the shaft has tolerances selected from the normal manufacturing range to provide the specified fit. Show the selected tolerances on the shop drawings.
- Accurately machine and polish all journal-bearing areas on shafts and pins, with no trace of tool marks or scratches, or steps on the journal surface and the adjoining shoulder fillets. Burnishing of the shaft journal areas and adjoining shoulder fillets to a mirror finish is acceptable in lieu of polishing, provided that burnishing is done with a Stellite roller or equal. Provide and install journals and bearings to an ANSI RC6 running fit unless otherwise noted in the Plans.

C.7 Field System Testing

After the bridge systems have been completely installed, conduct a full functional test of the span drive machinery operation; as specified in the electrical section of the contract documents. Include automatic and manual operations, of both raising and lower the span, in this test. The test shall show that the new machinery and limit switches work with existing interlock system.

C.8 Protection for Shipment

Coat all finished metal surfaces as soon as practical, after machining, with an approved rust-inhibiting compound. Completely protect center locks parts from weather, dirt and foreign materials during manufacture and store indoors while awaiting erection. Assembled units, including guides, receivers, operators and other devices having finished mounting surfaces will have those surfaces thoroughly coated with rust-inhibitor and to be skidded or crated for protection during handling, shipment and storage. Bag mounting hardware and other small parts for shipment. Provide and secure tags, recording the part number, to each part with wire or plastic ties prior to shipment.

D Measurement

The department will measure Span Drive Machinery Refurbishment 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.0060.022	Span Drive Machinery Refurbishment	EACH

Payment is full compensation for removing and properly disposing of all existing span components that are to be replaced by the new span drive machinery system; installing in working order and test the new bascule span drive machinery.

58. Center Lock Machinery, Item SPV.0060.023.

A Description

This special provision covers all apparatus, material and labor required to properly detail, manufacture, ship, install, adjust, test, paint and put into approved working order all parts of the specified replacement bascule center lock system. Furnish, at no extra cost, any device, material, labor or effort not herein specified, but required to complete the equipment system in a fully workable manner suitable to the city.

The existing center lock machinery and components to be removed includes, but are not limited to the following:

- Motor, motor reducer and limit switch with associated hardware.
- Forward and Rear Guide Castings and Receiver Castings.
- Shafts, bearings and couplings.
- Gear sets, pins, collars and rods.
- Lock bars.

The new Span Lock System machinery to be furnished and installed includes but is not limited to:

- Electric motor driven mechanical lock bar operator (2).
- Forged steel, 4 x 6 in. rectangular lock bars (2).
- Forward and rear lock bar guides (2 each - 4 total guides).
- Lock bar receiver assemblies (2 each).
- Separate end of travel limit switches
- Lubrication lines with centralized remote lubrication stations.
- Shims, fills, bolts and all other associated hardware.

The contract documents are diagrammatic in showing certain physical relationships which must be arranged within the mechanical work, that will interface with other work including electrical work. Coordinate mechanical work with electrical and structural work as well as closures and restrictions to vehicular and navigational traffic. Schedule and arrange mechanical work in a neat, well-organized manner.

B Materials

B.1 General

Materials used to fabricate the new center lock components shall be as specified herein, shown on plans, and as specified in the article BRIDGE MACHINERY - GENERAL.

B.2 Material Certifications

Submit material certifications for all materials specified to require material testing within the plans and specifications or within a referenced material specification (e.g., ASTM, ANSI, or others)

B.3 Procedures

In addition to required detailed shop drawings, submit to the engineer for review any other procedures described herein. The procedures must be thorough and be supplemented by sketches, calculations, details, catalog cuts, photographs, etc. as required to demonstrate that the specified requirements will be met.

B.4 Material Compatibility

Provide products which are compatible with other products of the center lock and with other work requiring interface with the center lock, including mechanical/electrical connections and control devices.

B.5 Nameplates

Provide each piece of center lock equipment and apparatus with a permanent, corrosion-resisting metal nameplate on which is stamped the name of the manufacturer, address and the catalog or model number, and the rating or capacity of the equipment or apparatus. Nameplates on all proprietary elements must be readable, clean, and free of all paint before acceptance of the machinery. The nameplate of the distributing agent will not be sufficient.

B.6 Substitutions

Specification of a manufacturer's part number, product, and/or name is for the purpose of defining quality, configuration, rating and arrangement of parts. Part numbers shown in the contract documents are not necessarily complete numbers nor are they intended to describe details of the component beyond those that are required. Be aware that manufacturers may change product names and part numbers without advance notification. Select and provide manufactured products that meet the requirements and intent as shown in the contract documents. Provide complete, current part numbers for all proposed equipment and verify that the part as designated is appropriate for the intended function. Contractor is responsible for design changes resulting from substitutions.

B.7 Material Acceptance

Furnish to the city test results of all certifications required of the contract documents, including copies of chemical and physical tests and certifications of compliance. Initial acceptance of materials and finished parts and assemblies will not preclude subsequent rejection if found deficient. Replacement of such materials will be the responsibility of the contractor.

B.8 Forgings

Unless otherwise specified or shown in the plans, use forgings that conform to American Association of State Highway and Transportation Officials (AASHTO) Bridge Construction Specifications, 3rd Edition, with 2016 interim revisions. Material grades must be as specified or shown in the plans.

B.9 Fasteners

B.9.1 High Strength Bolts

Unless otherwise specified, provide fasteners used for connecting center lock parts to each other and to supporting steelwork that are turned bolts conforming to the minimum specified physical requirements of high strength, ASTM F3125 Grade A449 cut thread, washer faced, hexagonal head bolts. Provide threads for turned bolts that conform to the requirements of ASTM F3125 Grade A325. Do not use ASTM F3125 Grade A490 bolts. Use nuts that conform to heavy hex series ASTM A563.

B.9.2 Bolt Dimensions

Dimension bolt heads, nuts and hexagonal cap screws according to ANSI B18.2. Such fasteners are to be of the heavy series.

B.9.3 Socket Head Screws

Provide socket head cap screws, socket flat head cap screws and socket set screws conforming to ANSI B18.3. Such screws must be heat treated alloy steel. Unless otherwise specified, set screws must be of the headless, safety type and be of the coarse thread series and have cup points. Do not use set screws to transmit torque nor as a stop for equipment that provides stability or contributes to operation of the bridge. Class 2 coarse thread tolerances are required for all bolts, nuts and cap screws.

B.9.4 Locking of Fasteners

Provide positive locks of approved types, for cap screws and nuts on turned bolts unless noted otherwise in the plans. Use standard thickness nuts where double nuts are required in locations where occasional opening or adjustment is necessary. Use flat jam nuts only where space prohibits use of standard nuts. Lock washers must be made of tempered steel and conform to regular SAE dimensions and specifications. High strength bolts shall be tensioned to create a self-locking effect.

B.9.5 Washers

Use hardened steel, plain washers conforming to ASTM F436 at the rotated end of high strength ASTM F3125 Grade A325 or Grade A449 bolts.

B.9.6 Miscellaneous Fasteners and Hardware

Unless otherwise specified or shown in the plans, provide miscellaneous fasteners and hardware, including cotter pins and lock wire of corrosion resistant stainless steel, with material composition of Type 316.

B.10 Weldments

Fabricate weldments for support of center locks from structural steel of the type and grade specified in the plans. Where the type and grade of steel is not specified in the plans, fabricate weldments from ASTM A709, Grade 50 structural steel. Use of steel plate larger than that denoted in the plans may be required to obtain the final required dimensions.

B.11 Lubrication of Center Locks

Provide lubricant systems and lubrication charts according to the article "Bridge Machinery – General"

B.12 Shims

Provide shims required for leveling and alignment that are full depth shims, drilled for all bolts that pass through, and trimmed to the dimensions of the assembled unit. Provide shim material from Type 316 stainless steel, thin brass precision thickness shims may be used for final adjustment. Provide sufficient thicknesses to permit 0.005 inch variations of the nominal shim thickness plus one full allowance shim. Provide the city with one full set of additional shims for each type of component.

B.13 Lock Bar Operator

Provide each span lock with a mechanical linear actuator. The actuator moves the lock bar through guides on the south leaf tip, and into a receiver on the west leaf tip. Provide a hand crank for manual operation.

Each operator shall be driven by a high starting torque, induction type, 3 HP, 1675 RPM, three phase, 60-hertz, 208-volt, NEMA design D, TENV motor with a 15-minute duty rating with a 3 ft-lbf marine duty brake with manual release and safety interlock switch. The motor shall be totally enclosed, non-ventilated, equipped with ball bearings and designed especially for marine applications subjected to adverse weather conditions. Strip heaters shall be installed in the motor housing.

Travel of the lock bars in each direction shall be governed by limit switches that provide open and closed contacts for each length of travel. The lock bar shall take approximately 15 seconds to complete its 21 1/2-inch stroke and the operator shall be capable of delivering a thrust to overcome Earle "Cushionlocks" resistance in each direction at 50% stall torque of the motor.

Install internal end of travel limit switches as an integral part of the new lock bar operator.

B.14 Guides and Receivers

The lock bar guides and receivers are of the energy absorbing type (Earle "Cushionlocks" manufactured by Steward Machine Co., Inc.) Each guide and receiver has high strength bronze wear shoes supported by a combination of stiff springs. When the lock bar is inserted into the guide and/or receiver it shall cause the shoes to depress the springs slightly resulting in a pre-loaded condition that will ensure continuous firm contact between the lock bar and shoes.

B.15 Paint for Center Locks

Clean and paint all unfinished, non-stainless surfaces of center locks, weldments, and equipment according to an epoxy paint system the manufacturer recommends, except as noted herein. Provide two coats of Carboline Carbomastic 15 - Aluminum at 7-10 mils each and top coat of Carboline Carbothane 133 VOC at 5-7 mils. The color of the finish coat shall be according to federal standard 595. Provide color samples for the city for final approval. All painting shall be factory applied. Apply field touch-up paint to coatings that are damaged during construction and installation.

Prime coat finished machined mounting surfaces only. Do not apply a finish coat to these surfaces.

After completing the operating tests and acceptance of the center locks, wash with an appropriate solvent all accumulated oil, grease, dirt, and other foreign matter from exposed center lock surfaces, except rubbing surfaces.

C Construction

C.1 General

Remove existing center lock assemblies with care to not damage existing bridge components.

Standard spec 506.3 applies to this item. Construct according to the requirements defined herein and in the plans and the provisions of the AASHTO Movable Specifications. Where a conflict exists between documents, the requirements of the plans and specifications will govern over those of the AASHTO Movable Specifications.

Install center locks and verify alignment using experienced millwrights and a millwright foreman having a minimum of 10 years of experience in setting and aligning heavy machinery. Submit to the engineer for review the qualifications of all proposed millwrights prior to installation.

C.2 Setting of Center Locks

Unless otherwise specified or shown in the plans, position center locks to be within the following tolerances:

Horizontal position:	1/32 in.
Vertical position:	1/32 in.
Orientation (parallel to Plan centerline):	0.5 degrees

C.3 Lubrication of Center Locks

Connect grease fittings with tubing or fittings so that grease is introduced directly into the grease passages for distribution. Tubing is to be extended from the guides to centralized remote lubrication stations as shown on the plans. Provide tubing supports at increments not to exceed 3 feet.

Immediately after installation and before operation, lubricate all rotating and sliding parts.

C.4 Welding and Weldments

Unless otherwise noted herein or in the plans, perform all welding and weld inspection of center locks according to ANSI/AASHTO/AWS D1.5. Treat all welded center lock members that support live load reactions as main members, all welds as subject to tension or stress reversal, and all welds as joining primary components. Do not perform field welding on these elements unless authorized.

Unless otherwise shown in the plans, connect elements of weldments by complete joint penetration welds. Do not use fillet welds where they would require machining to provide clearance for machinery, fasteners, or other attachments. Clip stiffeners to avoid overlapping stiffener welds with welds at the intersection of main plates.

Stress-relieve weldments after welding and prior to final machining. Unless otherwise shown in the plans, finish machined surfaces of weldments to flatness as required herein and parallel to each other and to the bottom of the base plate. The height of the weldment must be per plan height $\pm 1/16$ inch. All exposed edges of weldments must be ground to a chamfer or radius to eliminate sharp edges and burrs.

Unless specified in the plans or herein, dimensions between machined surfaces have a tolerance of 0.010 inch and machined surfaces have a flatness tolerance of 0.040 inch.

C.5 Startup Requirements

Implement startup procedures that protect the center lock equipment from damage and ensures safe working conditions during bridge operation throughout construction. Do not leave center lock assemblies in the engaged configuration without providing appropriate interlocking that prevents the operation of the bascule leaf until all systems are fully in place and tested.

C.6 Protection of Equipment

During construction, protect all equipment from damage that may result from construction operations and contamination from dust and debris. Should any equipment become contaminated, immediately clean the equipment, re-lubricate, and protect from further contamination. The center lock must not be operated, and no enclosed equipment opened during any period in which construction operations can contaminate the equipment.

C.7 Erection

Erect and assemble center locks according to part numbers and match marks. Adjust all parts for precise alignment by means of shims and pull parts tightly against supporting members by use of clamps, temporary bolts, or other approved means before drilling and reaming holes for connecting bolts. Install center locks within the specified tolerances and such that satisfactory operation is achieved.

Do not perform final shimming of the center lock assemblies until the following have been completed:

- The heel block assemblies have been fully refurbished and adjusted for complete engagement.
- The alignment across the roadway and sidewalk front and rear breaks are even.
- The bascules leaves are in a near-final balanced condition.

Unless approved by the engineer prior to construction, drill bolt holes in structural steel supports only after alignment of center locks. Do not install center locks unless mounting surfaces are clean of dirt, paint and other foreign materials. Securely tighten connecting fasteners and nuts to the specified torque values.

C.8 Field System Testing

After required items of work on the bascule span's structural, mechanical and electrical systems have been completely installed, conduct a full functional test of the center lock. Include automatic and manual operations of both driving and retracting both locks during this test. The test shall confirm that the new actuators and limit switches work appropriately with the interlocking system.

Verify the fully driven and fully retracted indications at the control console for each of the center locks.

Operate each center lock a minimum of four times with the leaf in the lowered position to the stroke indicated in the plans. During the test the center lock actuator must drive and retract the lock bar to not exceed 50% of full power to be accepted.

C.9 Protection for Shipment

Coat all finished metal surfaces as soon as practical, after machining, with an approved rust-inhibiting compound. Completely protect center locks parts from weather, dirt and foreign materials during manufacture and store indoors while awaiting erection. Assembled units, including guides, receivers, operators and other devices having finished mounting surfaces will have those surfaces thoroughly coated with rust-inhibitor and to be skidded or crated for protection during handling, shipment and storage. Bag mounting hardware and other small parts for shipment. Provide and secure tags, recording the part number, to each part with wire or plastic ties prior to shipment.

D Measurement

The department will measure Center Lock Machinery by each unit for both center lock units, 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.0060.023	Center Lock Machinery	EACH

Payment is full compensation for removing and properly disposing of all other components of the existing center lock equipment; installing in working order and test the bascule center locks.

59. Trunnion and Trunnion Bearing Refurbishment, Item SPV.0060.024.

A Description

This special provision pertains to all apparatus, material and labor required to properly detail, manufacture, ship, install, adjust, test, paint and put into approved working order all new and existing parts of the trunnions and trunnion bearings. Furnish, at no extra cost, any device, material, labor or effort not herein specified, yet required to complete or perfect the equipment in a manner suitable to the department.

Included in this work is the jacking required to elevate the leaves to permit removal of the trunnion bearings, and the lowering of the leaves to their operating position upon completion of the work.

Components to be removed include, but are not limited to:

- Four trunnion bearing bushings per bascule leaf.
- Four trunnion bearing liner sets per bascule leaf.

Components to be refurbished include:

- Four bearing housing caps per bascule leaf.
- Four bearing housing bases per bascule leaf.

Components be furnished and installed include, but is not limited to:

- Four trunnion bearing bushings per bascule leaf.
- Four trunnion bearing liner sets per bascule leaf.
- All bolts, shims and other hardware required for complete refurbishment.

The contract documents are diagrammatic in showing certain physical relationships which must be arranged within the mechanical work. Coordinate this work with structural work. Coordinate this with requirements for maintaining navigation. Schedule and arrange this work in a neat, well-organized manner.

B Materials

Materials used to fabricate the new trunnion bearing components shall be as shown on the contract documents and according to the requirements of the article Bridge Machinery – General.

Clean and paint all components being reused.

C Construction

C.1 General

- The four existing trunnions are to remain mounted in the bascule girders and their journal surfaces are to be inspected and polished in place to remove surface corrosions or other minor irregularities. This requires elevating the leaves to remove the trunnion bearings in order to provide sufficient clearance to accomplish the work.
- The eight existing trunnion bearing housings are to be temporarily removed for reconditioning.
- Before starting work on the trunnions and their bearings, submit to the engineer for approval, a plan of the procedure to be followed in completing the work. Full details of the contractor's plan for elevating and stabilizing the leaf, removing the trunnion bearings, polishing the trunnion shafts, rehabilitating the trunnion bearings, re-installing the trunnion bearings to achieve correct alignment of the leaf and returning the leaf to service must be approved by the engineer before the leaves are removed from service.
- Prior to undertaking any work, identify and record the location of each trunnion and trunnion bearing. Accurately determine and record the present trunnion and trunnion bearing elevations and alignments and match mark the trunnion bearing assemblies with their associated trunnion shafts. The caps and bases of each trunnion bearing shall also be match marked to avoid mingling of the parts when the units are disassembled. All match marks shall be permanent in nature and located on surfaces so that they do not interfere with satisfactory operation of the pieces. Prepare and maintain a key diagram indicating the location and match mark identification of all trunnions and bearing assemblies together with the alignment and elevation data for each leaf.
- Following is a potential procedure for refurbishing the trunnion bearing assemblies:
- Before jacking the bridge leaf install a piano wire through the center holes in the trunnion shafts. Locate wire brackets where they won't be disturbed. This will be used to relocate trunnion shaft, leaf and bearings after refurbishment.
- After each bascule leaf is jacked remove the piano wire and disassemble the trunnion bearings.
- Measure existing shim packs for each trunnion bearing.
- Polish trunnion shaft journals.
- Refurbish trunnion bearing base and cap.
- Fabricate new bushings and liners.
- Fabricate new turned bolts and shim packs.
- Re-install new bushings and liners into refurbished housing components. Set to a RC6 fit between the shaft and the bushing.

- Using shims equivalent to the measured existing shim packs put trunnion bearings back on supports.
- Re-install piano wire and verify alignment of bearings. Adjust as required. Trunnion shaft alignment shall be within 0.015" to one another.

Final-drill holes and install new turned bolts.

Standard spec 506.3 applies to this item. Construct according to the requirements defined herein, the plans and the provisions of the AASHTO Movable Specifications. Where a conflict exists between documents, the requirements of the plans and specifications will govern over those of the AASHTO Movable Specifications.

Refurbish trunnion bearings using experienced millwrights and a millwright foreman having a minimum of 10 years of experience in setting and aligning heavy machinery. Submit to the engineer for review the qualifications of all proposed millwrights prior to installation.

C.2 Refurbish Trunnion Bearing Bases and Caps

After removing the bearings from the bridge, disassemble the units and remove the bronze bushings, brass dowels and fasteners. Adequately protect the finished surfaces of the base, including the base mounting surface, and cap in preparation for blast cleaning. Take particular care not to damage the match marks on the bearing components. Blast clean the bases and caps in accord with Commercial Blast Cleaning Requirements. After blast cleaning, thoroughly inspect the caps and bases for any evidence of cracks, deterioration or other indications of distress. Report the inspection findings to the engineer.

Perform the following operations on each of the bearings:

Clean and dress the base mounting surface.

Verify the parallelism of the mating surfaces for the cap, the bored surface for the bushing and the perpendicularity of the end supporting the bushing thrust flange with the base mounting surface. If unsatisfactory conditions exist, propose corrective means to prepare the base for fit up with the new bushing.

Furnish and install new bushings with new locating dowel pins. The OD of the bushing shall be machined for the required fit with the housing bore, after housing has been machined, and have sufficient stock in the bore to allow for machining to achieve the proper running fit with the trunnion journal. Install new dowel pins, located in the positions of the existing holes in the bases.

Dress and polish the thrust surface on the inside end of the cap.

Assemble the unit with the bronze bushing, using the match mark key diagram, locating dowels and full thickness liners in place, using new turned stud bolts to secure the cap.

Finish machine the bore in the base and cap, at the true centerline, to a diameter that will achieve an RC-6 running fit with the trunnion journal. Note: Bore each trunnion bearing to suit the trunnion diameter at the location from which it was removed.

Paint the assemblies and protect all finished surfaces from damage during handling.

C.2 Lubrication of Trunnion Bearing Assemblies

Connect grease fittings with tubing or fittings so that grease is introduced directly into the grease passages for distribution.

During erection apply a thin film of lubricant to bearing surfaces. Immediately after erection and before operation, lubricate all rotating and sliding parts.

C.3 Protection of Equipment

During construction, all equipment must be protected from damage as a result of construction operations and contamination from dust and debris. Should any equipment become contaminated, immediately clean the equipment, re-lubricate, and protect from further contamination.

C.6 Erection

Erect and assemble trunnion bearings according to part numbers and match marks. Adjust all parts for precise alignment by means of shims and pull parts tightly against supporting members by use of clamps, temporary bolts, or other approved means before drilling and reaming holes for connecting bolts. Install trunnion bearings within the specified tolerances and such that satisfactory operation is achieved.

Do not perform final bolting of the trunnion bearings until the following have been completed:

- The inboard trunnion shaft piano wire measurements are within 0.015" total.

All items of work, on the related bascule leaf, have not caused significant alignment changes.

Unless approved by the engineer prior to construction, drill bolt holes in structural steel supports only after alignment of trunnion bearings. Do not install trunnion bearings unless mounting surfaces are clean of dirt, paint and other foreign materials. Securely tighten connecting fasteners and nuts to the specified torque values. If uneven mounting surfaces are present, provide finger shims at bolt locations to produce even mounting surfaces. Use epoxy to fill voids between mounting surfaces.

C.7 Protection for Shipment

Coat all finished metal surfaces as soon as practical, after machining, with an approved rust-inhibiting compound. Completely protect all components from weather, dirt and foreign materials during manufacture and store indoors while awaiting installation.

D Measurement

The department will measure Trunnion and Trunnion Bearing Refurbishment as a single unit of work on the entire structure, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.024	Trunnion and Trunnion Bearing Refurbishment	EACH

Payment is full compensation to complete all work described herein. This includes but is not limited to raising and supporting the bridge leaves; removing the trunnion bearings; reconditioning the trunnion journals and trunnion bearings; reinstalling the trunnion bearings; and testing, lubricating and painting components to achieve a complete and acceptable installation.

60. Bridge Electrical Work, Item SPV.0060.025.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, finishing, testing, and making fully operational the electrical, monitoring and control components and systems for the bridge. All additional special provisions provide further information, requirements, and guidelines that are applicable to the work paid for under the bid items addressed by this special provision.

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.

It is the intention of the contract plans to call for completely finished work, fully tested and ready for reliable and consistent operation. Furnish, deliver, and install any apparatus, appliance, materials, or work not shown on the plans but mentioned in the special provisions or vice versa, or any incidental accessories necessary to make the work complete in all respects and ready for operation, to be furnished, delivered, and installed without additional expense to the department.

A.1 Scope

The work under this item includes the following:

Conduit, junction boxes, hand holes and wiring required for installation of all power and control cabinets, motors, brakes, rear locks, limits, gates, barriers, traffic signals, roadway lighting, CCTV, auxiliary equipment and bridge amenities (i.e., furnace, etc.) that require electrical connections.

Lights and receptacles in operator house, machinery rooms and on/in the bascule piers, including architectural up-lighting in the operator house.

Motor Disconnects

Remove and dispose of existing east and west sides of the bridge power and control equipment including but not limited to Incoming power metering, main disconnects, control console, switchgear, lighting, receptacles, water monitoring / sampling system, exposed conduits and conductors, power distribution equipment and electrical support hardware. Existing concrete embedded conduits shall be utilized to the extent possible including removal and increasing the size of the conduit penetration to install bigger conduits. Cap unused concrete embedded conduits.

A.2 Provisions

Unless otherwise noted, work under this special provision conforms to the requirements of the following special provisions:

- Span Drives and Motors
- Control Console- Cherry Street
- PLC Controls – Cherry Street
- PLC and Communication Modifications – Cherry Street
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable
- Architectural Exterior Bridge LED Lighting
- Bridge Machinery-General
- Remote Bridge Control from Knapp St.
- Fire Alarm / Burglary System.

A.3 Coordination of Electrical Work

The contract documents are diagrammatic in showing certain physical relationships which must be arranged within the electrical work, and which must interface with other work including utilities and mechanical work. Coordinate electrical work with the work of other trades to eliminate conflicts. Advise other trades of openings required in their work for the subsequent move-in of large units of electrical equipment.

Schedule and arrange electrical work in a neat, well-organized manner. Any shut down of the bridge during the scheduled work must be coordinate with the department.

Locate operating and control equipment to provide easy access and arrange entire electrical work with adequate access for operation and maintenance, as per the latest NEC requirements.

A.4 Electrical Journeymen

A.4.1 Designation of Electrical Journeymen

Provide a listing of pre-qualified electrical journeymen to perform the electrical work according to this special provision. Perform all work either by, or under the immediate supervision of an electrical journeyman. For this project, "under the immediate supervision" is defined to mean that the journeyman is in the immediate vicinity and physically involved in performing the electrical work. It is the intention of this special provision that the journeyman's knowledge, talents, and skills in performing certain critical work will be judged and approved by the engineer and that the journeyman will do the actual work utilizing those talents and skills. Helpers are expected to aid the journeyman in the performance of the work and not to act as non-credentialed surrogates of a remote journeyman. Non-approved helpers may only perform tasks of a support nature that do not directly involve responsibility for the installation, connection, or adjustment of electrical materials.

A.4.2 Qualification of Electrical Journeymen

Each electrical journeyman must hold, at a minimum, an active journeyman electrician's license, by examination, in the State of Wisconsin, and have at least five (5) years of experience in industrial electrical work. The journeyman must also have knowledge and experience on emergency power systems and other electrical devices required to operate the movable bridges. Each journeyman must be pre-approved by the engineer based on submitted documentation of licensing, training and experience history. The engineer might also require a demonstration of knowledge of the tool and technique requirements of specialty electrical work to be performed including, but not limited to: conductor pulling, termination, testing, installation of conduit and conductors and associated device mounting before the journeyman will be permitted to perform such specialty work.

B Materials

Provide all new materials that conform to the standards of the Underwriters Laboratories, Inc., in every case where such a standard has been established for the particular type of materials in question. Submit to the engineer for approval, prior to purchase of any materials or equipment required to be furnished and installed, a complete list of all such materials and equipment including manufacturer's catalog (part and/or model) numbers, catalog data sheets, illustrations, and shop drawings.

B.1 General

In addition to the standard specifications, provide and install all equipment according to the applicable requirements of the following:

AASHTO Standard Specifications for Movable Highway Bridges

NFPA 70 (2020 Ed.), National Electrical Code

NFPA 79 (2021 Ed.), Electrical Standard for Industrial Machinery

Ensure that equipment and its installation present a neat and attractive appearance. Use new heavy-duty industrial design, equivalent to the best grade of the particular type of equipment made by the leading manufacturers of such equipment.

Furnish new equipment that is compatible with all other associated equipment in the system. Ensure that all items furnished perform the function indicated on the approved drawings and as required by the design.

Equipment sizes and space shown on design drawings are approximate. Ensure that all required electrical equipment components can be adequately located in the operator's house and elsewhere on the project as required.

Have normal manufacturer warranties extended to cover parts and labor for this period of one year after Substantial Completion.

B.2 Disconnect Switches

Furnish and install heavy-duty disconnect switches having electrical characteristics, ratings, and modifications shown on the drawings. Furnish and install fuses for fused disconnect switches. Provide fuses and switches conforming to the following:

UL 248-1-Low Voltage Fuses- Part 1: General Requirements

UL 248-12- Low Voltage Fuses- Part 12: Class R Fuses.

FS W-F-870 - Fuse Holders and Fuse Clips (For Plug and Enclosed Cartridge Fuses).

FS W-S-865 - Switch, Box, (Enclosed), Surface-Mounted.

NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600V).

Provide the following:

NEMA Type 4X (316 stainless steel) enclosures in the machinery room and service disconnects.

NEMA 12 units in the rooms at the operator level, entry level and lower level.

Metal front cover mounted factory nameplates that contain a permanent record of switch type, catalog number, and HP rating.

Pad-lockable handles with easily recognizable positions.

Switches that include visible blades, reinforced fuse clips, and non-teasible positive quick make-quick break mechanisms.

Switch assemblies and operating handles that are an integral part of the enclosure base.

Switches that are HP rated and meet Federal and NEMA Specifications.

Switches that have defeatable door interlocks that prevent the door from opening when the operating handle is in the ON position.

Heavy duty switches with line terminal shields.

Fusible switch assemblies of NEMA KS 1 construction with quick-make, quick- break load interrupter enclosed knife switch with externally operable handle

interlocked to prevent opening front cover with switch in ON position and Handle lockable in OFF position. Furnish fuse clips designed to accommodate Class R fuses.

Non-fusible switch assemblies of NEMA KS 1 construction Type HD with quick- make, quick-break load interrupter enclosed knife switch with externally operable

handle interlocked to prevent opening front cover with switch in ON position and Handle lockable in OFF position. One N.C. (normally closed) and one N.O. (normally open) set of auxiliary contacts is required.

Fuses that are time delay, current-limiting type with 200KA interrupting rating at 600 VAC. Rejection type are required that are, UL listed to minimize short circuit

damage. Use UL Class RK1 for service entrance, transformer feeder and panelboard feeder. Use UL Class RK5 for motor branch circuit.

B.3 Wiring Devices

B.3.1 General Requirements

Conform to UL 943- Ground-Fault Interrupters.

B.3.2 Toggle Switches

Toggle switches are to be heavy-duty use, totally enclosed type with bodies and, handles of thermosetting plastic, supported on a metal mounting strap. Provide wiring terminals of the screw type, side-wired. Back-wired, clamp-type terminals are not allowable. Use switches with snap type with toggle handle, rated quiet type, AC only, 20 A, 120/277 VAC, single pole. Use three-way switches as shown in plans. Install with OFF position down. Provide motion sensor type toggle switches where indicated.

B.3.3 Receptacles

Receptacles are to be heavy-duty use, duplex grounding type rated 20 A and 125 VAC. Provide bodies with thermosetting plastic composition, supported on a metal mounting strap. Use receptacles with side-wired with binding-type terminals. Back-wired, clamp- type terminals are not allowable. Use grounded pole type that is connected to the mounting strap. All weather exposed receptacles shall be weatherproof type. Provide GFI receptacles where indicated.

B.3.4 Ground Fault Circuit Interrupter (GFCI) Receptacles

Provide GFCI duplex receptacles that are feed-through type, convenience receptacle with integral ground fault current interrupter. Provide GFCIs that are rated at 125 VAC and 20 A and capable of detecting a current leak of five (5) mA. Receptacles shall be connected to protect the local load without disruption of the rest of the circuits. All weather exposed receptacles shall be weatherproof type. Weather proof GFIC type receptacles shall be provided in the machinery room, and non-environmentally controlled areas.

B.4 Lighting

B.4.1 General Requirements

Furnish and install fixtures per the lighting schedule shown in plans. Unless otherwise specified, each luminaire shall be listed by the Underwriters' Laboratories as suitable for application and location shown and conform to any additional regulations necessary to obtain approval for use in locations shown. If Underwriters' Laboratories listing of luminaire is waived, all electrical components shall be UL recognized. Include provision for through-branch circuit wiring for all recessed incandescent and high intensity discharge luminaires shall include provision for through-branch circuit wiring. Provide internal wiring of luminaires with a minimum number of splices and make all splices with approved connectors. Ensure wiring and connectors are suitable for the current, voltage and temperature to which they will be subjected.

Manufacture luminaires with the minimum possible number of joints. Make joints only by means of approved welded, brazed, screwed, or bolted construction methods. Soldered joints are not acceptable. No self-tapping screws, bled metal tapping methods, or rivets shall be employed for fastening any parts which must be removed to gain access to electrical components requiring service or replacement, or for fastening any electrical component or support for same. Manufacture ferrous metal parts and supports of luminaires other than parts manufactured of stainless steel completely rustproofed after fabrication and before finishing coatings are applied, by treatment with an approved rust-preventing process. Pre-treated sheet steel shall not be accepted unless treated as above. Provide mounting frames and all screws, bolts, nuts, and other fastening and latching hardware of stainless steel, unless otherwise specified.

Final finish shall be uniform, even in appearance, free from runs and surface imperfections. Luminaires for use at wet or damp locations must be suitably gasketed to prevent access of moisture into electrical components or enclosing diffusers, lenses, or globes.

Unpainted aluminum parts of luminaires must be anodized with coating of sufficient weight to protect against corrosion. Anodize visible surfaces and trim with minimum coating of 35 mg. per square inch.

Where stainless steel or non-ferrous metal surfaces (other than reflectors) are to remain unpainted, or where steel surfaces are to be electroplated, unless otherwise specified, coat with a baked-on clear lacquer. Reflectors must be free of ripples, tool marks and other surface imperfections.

Provide exterior fixtures, accessories, and enclosures complete with gaskets to form weatherproof assembly.

B.4.2 Emergency Lights

Provide self-contained LED emergency lighting units with rechargeable storage batteries, charger, and lamps. Equip each unit with an automatic power failure device, test switch, pilot light, and fully automatic high/low trickle charger. Provide sealed wet-cell type batteries, with 1.5 hour capacity to supply the connected lamp load, operate unattended, and be maintenance-free for a period of not less than 10 years. Emergency lighting units shall be rated for 12 V, except units having no more than two unit-mounted lamps may be rated 6 V. Provide dual-rate charger, capable of maintaining the battery in a full-charge state during normal conditions, and capable of recharging discharged battery to full charge within 12 hours. Lamps shall be 12 watts minimum, sealed beam type in plastic housing. Unit shall have plastic enclosure. Provide lamps to indicate AC ON and RECHARGING. Provide TEST switch.

B.4.3 Operator House Ornamental Uplights

Furnish and install high performance LED linear grazing light similar to Phillips LEDLINE2 fixtures or as shown on contract drawings. Provide 600mm length fixtures with a minimum of 24 LEDs. The input to the fixtures must be 100-240 volts AC, auto switching, and 60 hertz. The LED must be white in color and have a correlated color temperature (CCT) of 2700K or as directed by the engineer.

B.4.4 Wallpack Fixtures

Furnish and install high performance LED style wallpack fixtures U.L. listed for wet locations. Provide fixtures with a rugged cast aluminum housing with a polyester powder coat finish. The input to the fixtures must be 100-240 volts AC, auto switching, and 60 hertz. Provide fixture with a minimum of 2500 lumen output.

B.4.5 Linear Ceiling Fixtures

Furnish and install high performance LED linear rough service LED fixtures U.L. listed for wet locations. Fixtures shall be approximately 4-5' in length and be 120 VAC rated with a minimum of 4000 lumen output.

B.4.6 Additional Fixtures

Refer to contract drawing for additional fixture requirements.

B.5 Boxes

B.5.1 Control Panels and Cabinets

Furnish and install NEMA 12 enclosures for all enclosures located in each Operator's house or as noted in plans. Wall mounted enclosures must be a minimum of 14 gauge sheet steel. Free standing enclosures must be a minimum of 12 gauge sheet steel. Provide enclosures with data pockets, 3 point latches and a continuous hinge. Provide back panels on all enclosures and side panels if required.

Furnish and install NEMA 4X stainless steel enclosures for all locations other than the rooms of the operator level, entry level and lower level of the operator house. Wall mounted enclosures must be a minimum of 14 gauge 304 stainless steel. Small non-metallic enclosures need to be approved by the engineer. Free-standing enclosures must be a minimum of 12 gauge stainless steel. Provide enclosures with heavy duty three-point latching mechanism. Provide enclosures with data pockets, three-point latches and a continuous hinge. Provide back panels on all enclosures and side panels if required.

Install all electrical equipment in each cabinet on sheet steel back or side panels. The components will be front connected, front wired and removable from the front. Arrange the equipment in a systematic and neat arrangement that allows for ease of maintenance.

Provide all control cabinets with a door operated fluorescent light and a convenience receptacle. The power for these devices will be separate from control power. Provide an individual 5 A circuit breaker in each cabinet to isolate and protect the circuit.

B.5.2 Device Boxes

Provide wall-mounted boxes for wiring devices (toggle switches, duplex receptacle, GFCI) that are cast metal. Provide drain holes in the boxes. Provide all boxes with mounting lugs and securely fasten them to the structure with not less than four bronze or monel metal through-bolts.

Boss, drill, and tap for threaded conduit ends, which enter squarely, all cast iron boxes Fabricate from hot-dip galvanized structural steel Type A36 not less than 3/8-inch thick framework for supporting boxes, switches, and other externally mounted electrical devices.

Use brass, monel metal, or stainless steel for all mounting bolts, nuts, washers, and other hardware used for fastening boxes, disconnect switches, devices, lighting outlet boxes, conduit clamps, and similar devices. Use hexagonal bolt heads and nuts, and do not use bolts smaller than 3/8 inch in diameter except as may be necessary to fit the mounting holes in small devices, outlet boxes, and similar standard equipment.

B.5.3 Boxes and Enclosures

All pull boxes, junction boxes, and all enclosures, panels and cabinets, and all other miscellaneous housings used for pulling wires, terminating wires, or otherwise used to install electrical equipment must conform to the following requirements unless specifically stated elsewhere. For all locations, provide 4X (stainless steel) enclosures that are UL-listed for the application. If unavailable, then NEMA 4 rating may

be substituted. Specify all mounting hardware material for Supporting Devices. Specify construction requirements device boxes.

Provide sheet metal enclosures with "O-ring" sealing hub connectors. Equip the conduit ends projecting into all boxes and enclosures with insulated bushings. Drill no box or enclosure for more conduits than actually enter it. Use of wireways (metallic or non-metallic) and/or sheet metal troughs with hinged or removable covers are acceptable provided their use is limited and locations are approved by the engineer. Comply with the 40 percent fill allowance per NEC.

B.5.4 Boxes and Enclosures

Use hand-holes that conform to the standard specifications.

B.6 Terminal Blocks

Provide terminal blocks for any conductor that enters or leaves a cabinet or junction box. Provide spring clamp style terminal blocks for conductors 10 AWG and smaller. Use terminal blocks rated at a minimum 600 Volts, 30 A. Provide terminal blocks with a minimum of three conductors with field side of terminal blocks utilizing two conductors. Use terminal blocks as manufactured by Allen Bradley, Wago, Phoenix or approved equal.

Use manufacturer accessories for jumpers, end barriers, clamps and wire markers. All terminal block markers will be printed. Hand marked terminals will not be accepted.

B.7 Electrical Identification

B.7.1 Cabinets

Provide legend nameplates for all major pieces of equipment named on the plans, and for all control devices. Provide a plastic laminated engraved nameplate mounted with stainless steel screws for each device. Mark devices as indicated on electrical schematics, for fuses and breakers, include the amperage or fuse part number. Use white nameplates with black lettering. Taped labels can be used on the inside of the console top to identify the selector switches, pushbuttons lights and etc.

Provide nameplates for equipment identification with minimum letter height of 3/16 inch. Use a minimum ¼-inch high nameplates for the console top. Use 1/16-inch minimum thickness plastic nameplates.

Degrease and clean surfaces to receive nameplates. Install nameplates parallel to equipment lines. Secure nameplates to equipment fronts using stainless steel screws or approved manufacturer's recommended adhesive. Secure nameplates to inside of recessed panelboard doors in finished locations.

B.7.2 Conduit Markers

Provide adequate marking of primary conduits, which are exposed or concealed, in accessible spaces, to distinguish each run as either a power or signal/communication conduit. Use orange banding with black lettering except as otherwise indicated. Provide snap-on type plastic markers. Indicate voltage ratings of conductors where above 240 VAC. Locate markers at both ends of conduit runs, near switches and other control devices, near items of equipment served by the conductors, at points where conduits pass through walls, floors or into non-accessible construction, and at spacing of not more than 50 feet along each run of exposed conduit. Switch-leg conduit and short branches for power connections need not be marked, except where conduit is larger than 1 inch. Both ends of each marked conduit run shall be provided with a brass tag having a number stamped thereon according to the conduit diagrams. These tags shall be securely and permanently fastened to the conduit ends with bare copper wire.

B.7.3 Console

Provide plastic laminated engraved nameplates for the top of the console. For new consoles, provide black lettering on white background plastic laminated engraved nameplates for the top of the console.

Secure nameplates not secured by a pushbutton or indicator light with stainless steel screws. Adhesive backed nameplates as the only means of securing nameplates will not be allowed.

Provide nameplates for equipment identification with minimum letter height of 3/16 inch. Use a minimum ¼-inch high nameplates for the console top. Use 1/16-inch minimum thickness plastic nameplates.

B.7.4 Wire and Cable Markers

Provide wire and cable markers that are vinyl cloth, split sleeve, or tubing type. Wire numbers printed on wire insulation are not acceptable.

B.8 Supporting Devices

B.8.1 General

Conduit and equipment supports and anchors and fasteners.

- NECA - National Electrical Contractors Association.
- ANSI/NFPA 70 - National Electrical Code.

UL - Underwriter Laboratories, Inc.

B.8.2 Manufacturer's Instructions

Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

B.8.3 Regulatory Requirements

Conform to requirements of ANSI/NFPA 70. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

B.8.4 Material Requirements

Provide adequate corrosion resistance. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products. Minimum safety factor is 2.0. Framework for supporting boxes, switches, and other externally mounted electrical devices shall be hot-dip galvanized steel. For U-Channel strut systems utilizing bolted construction, all components shall be of the same manufacturer, and shall be 12 gauge and 1-5/8-inch width minimum.

B.8.5 Fiberglass Bridge Hangers

Fiberglass components shall be manufactured using isophthalic polyester resin with UV inhibitors. Material shall be fire retardant and shall exhibit low smoke generation. Fiberglass tensile strength shall meet ASTM D638 with a value no less than 30,000 psi and shall be UL 94 listed.

Hangers shall be designed and fabricated in such a manner as to eliminate the possibility of crushing the square tube by tightening the nuts on the suspension or intermediate rods (the spacer tube shall rest on the bottom part of the square tube).

The support rods, intermediate rods, and all metallic hardware shall be stainless steel and shall meet or exceed the following: Threaded Rod SS316 ASTM A193 grade B8M Hex nut ASTM SS316 A194 grade 8M Flat washer SS18-8 Lock washer SS18-8.

The components of the hangers may include: 2" x 1/2" (50.8mm x 12.7mm) Fiberglass flat bar, all holes on centerline, holes for support rods, 1" (25mm) from each end of plate. Length as required. 2" x 2" x 1/4" (50.8mm x 50.8mm x 6.4mm) Fiberglass square tubing, all holes on centerline, holes for support rods, 1" (25mm) from each end of plate. Length as required. 1" OD x 0.755" ID (25.4mm OD x 19.2mm ID) Fiberglass spacer tube. Length as required. 3/4" (19mm) All thread rod with 2 nuts, 2 lock washers and 2 flat washers. All material shall be 316 stainless steel. Length as required.

B.9 Conduit and Wiring

B.9.1 General

Furnish and install conduit and raceways in the quantities and sizes required to complete the work as shown on the plans and as required by NEC. Conduit and circuits indicated on plans diagrams and schedule may be recombined in the field where appropriate, with the approval of the engineer. Section Includes: metal conduit, non-metallic conduit, liquid tight flexible metal conduit, and fittings and conduit bodies.

Use rigid galvanized steel conduit for conduit in the lower, entry and operator's level rooms. Use of thin wall EMT is allowed for lighting and receptacle circuits that are installed behind finished drywall. Use PVC coated rigid galvanized steel conduit for all exterior conduit that is located outside the three rooms listed above. Use PVC schedule 40 for concrete embedded and installed in a trench and in counterweight pits, unless the conduit is under a roadway, then use Schedule 80.

B.9.2 Conduit drawings

Before the initial start of construction, submit a full size drawing showing all conduit runs between all pieces of equipment for review and approval. Provide "as-built" drawing for riser diagrams and schedules.

B.9.3 Definitions:

- Conduit: Pipe that has been treated, threaded, and classified to be suitable for use as an electrical raceway.
- Conduit Body: Fitting with removable cover to allow pulling conductors and which may also provide means for making a tight turn or "tee" connection in conduit.

Fitting: Accessory component for joining conduit (coupling), connecting conduit to box or enclosure (connector or hub), or providing other functions (such as expansion fitting).

B.9.4 Conform to the following:

- NEMA/ANSI C80.1 - Rigid Steel Conduit - Zinc Coated (GCR).
- NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- NEMA TC 2 - Electrical Polyvinyl-Chloride (PVC) Tubing and Conduit.
- NEMA TC 3 - PVC Fittings for use with Rigid PVC Conduit and Tubing.
- NEMA TC 14 - Filament-Wound Reinforced Thermosetting Resin Conduit.
- UL 651 - Schedule 40 and 80 Rigid PVC Conduit.
- NCEA 101 - Standard Practice for Good Workmanship in Electrical Construction.
- NEMA VE 2 - Metal Cable Tray Installation Guidelines.
- UL 1684 - Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.
- UL 514B - Fittings for Cable and Conduit.
- UL 360 - Liquid-Tight Flexible Steel Conduit.

UL 6 - Rigid Metal Conduit.

B.9.5 Conduit Requirements:

- Minimum Size: $\frac{3}{4}$ inch minimum trade size for rigid and PVC, unless otherwise specified. $\frac{1}{2}$ inch for EMT.
- 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 according to 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.
- 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.

- LIQUIDTIGHT FLEXIBLE METAL: UL 360; Interlocked steel construction with PVC jacket. Fittings: NEMA FB 1.

RIGID NONMETALLIC CONDUIT: NEMA TC 2, schedule 80 or schedule 40 (UL 651). PVC fittings NEMA TC 3 to match conduit. Embedded in concrete use only.

B.10 Conductors

B.10.1 General

For building wire and cable, wiring connectors and connections, and flexible cable.

Conform to the following:

- ANSI/NFPA 70 - National Electrical Code.
- ASTM B3/ANSI C7.1 - Standard Specifications for Soft or Annealed Copper Wire.
- UL 83 - Thermoplastic-Insulated Wires and Cable.
- UL 44 - Thermoset-Insulated Wires and Cable.
- UL 854 - Service Entrance Cables.
- UL 1063 - Machine-Tool Wire and Cables.
- UL 1685 - Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical Cables.

Conform to requirements of ANSI/NFPA 70. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

B.10.2 Project Conditions

Verify that field measurements are as shown on plans and matches field conditions where applicable. Wire and cable routing shown on plans is approximate unless dimensioned. Field verify and re-route wire and cable as required to meet project conditions. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required. Determine required separation between cable and other work. Determine cable routing to avoid interference with other work.

B.10.3 Building Wire and Cable

No aluminum or solid copper conductors allowed. For single conductor insulated wire use no wire smaller than No. 12 AWG for power and lighting circuits and no smaller than No. 14 AWG for control wiring, except that control wiring within a cabinet may be No. 16 AWG. Minimum field wire size is No. 12 AWG for control and No. 10 AWG for motor loads. Use minimum No. 10 AWG for 20 A, 120 VAC, branch circuit home runs longer than 75 feet, and for 20 A, 208/240/277 VAC, branch circuit home runs longer than 200 feet.

Furnish insulated conductors of seven or nineteen strand copper, minimum 98 percent conductivity and connector accessories for copper in sufficient quantities for a complete installation. Use twisted shielded pairs in cases of low level audio or digital signal when required. For interior locations, provide XHNW, THHW/THWN-MTW insulation rated 600 VAC unless otherwise noted. For exterior locations, provide XHHW insulation rated 600 VAC. Provide type SE, USE-2, RHW-2 or RHW insulation for incoming service conductors, unless otherwise noted. All field wiring shall be rated 90 °C.

B.10.4 Circuit Identification

Each circuit 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 Construction

C.1 General

C.1.1 Codes

Comply with all local codes, all laws applying to electrical installations in effect and with the regulations of the latest edition of the National Electrical Code, where such regulations do not conflict with the laws in effect and with the requirements of the utility company. Construct, wire, and install all luminaries in compliance with all applicable national, state and local codes.

C.1.2 Protection of Electrical Equipment

Protect electrical equipment from water damage, especially from rain, snow, condensation, and water dripping or splashing on equipment and wiring, at all times during shipment, storage and construction (prior to final acceptance). Provide temporary electrical connections to equipment heaters, or provide temporary heaters, as required to prevent damage from moisture.

Thoroughly dry out and put through a special dielectric tests as directed by the engineer at no cost to the city, or replace if not tested to the satisfaction of the engineer, any apparatus that has been subjected to possible injury by water or dampness (including the interiors of motor control equipment, submarine cable ends, or any other electrical devices).

C.1.3 Coordination of Bridge Electrical Work

The plans are diagrammatic in showing certain physical relationships which must be arranged within the electrical work, and which must interface with other work including utilities and mechanical work. Coordinate as necessary between trades to allow for proper installation of all electrical work and to eliminate conflicts. Locate operating and control equipment to provide easy access and arrange entire electrical work with adequate access for operation and maintenance, as per the latest NEC requirements.

C.1.4 Field Measurements and Surveys

Prior to development of submittals, conduct field surveys to verify construction dimensions. Identify field dimensions on submittals that have been field verified. Conduct field measurements and surveys as required to supplement information provided to provide a complete and satisfactory fitting and fully operational installation.

C.2 Submittals

Submit electrical equipment, hardware, drawings, testing plans, and documentation for all electrical items described in the contract documents, except for the submarine cables installation. Submarine cables installation is submitted as a separate bid item.

Submit working plans and shop drawings as prescribed in the contract documents and in this special provision. Clearly mark manufacturer's standard drawings that indicate dimensions and/or options for more than one piece of equipment to clearly indicate what data applies.

Provide a separate submittal package for this and all other electrical bid items unless otherwise indicated. Label each submittal package to indicate the project name and bid item number. Label data sheets for individual components such as motors, limit switches, etc. with the identification numbers shown in the plans and the special provisions.

Submit all components of a bid item by task (Traffic Gates, Traffic Signals, Navigational Lights and Aids, Sump Pump, etc.). Include shop drawings drawn to scale and certified by the manufacturer for all submittals for major electrical equipment. Where wiring diagrams, schematic diagrams, engraving schedules, conduit drawings, interconnection diagrams, one- line, three-line diagrams, etc. are called for or provided, they are to be site specific.

For motors, submit manufacturer's product data, installation instructions, operation and maintenance data. Include assembly drawings, bearing data with replacement sizes, and lubrication instructions. Clearly identify the locations of each motor terminal connection box relative to the bridge drive machinery. Ensure proper clearances of all components.

Submittal approval shall be on an "all or none" basis. Provide complete resubmittals even if some items on the original submittals may not have been marked deficient. Provide sufficient time in project schedule to allow for the possibility of repetitious submittals without creating delays to the project. The department will not bear any responsibilities for delays caused by repetitious submittals.

C.3 As-Built Drawings

At the completion of the project, provide complete as-built drawings. As-built drawings will be essentially the same as the working plans and shop drawings submitted for approval but showing all of the changes made during construction.

C.3.1 Working Drawings

Prepare and submit to the engineer for approval the following working drawings and documents executed according to the provisions of the contract:

- A drawing to scale showing the location, depth, and length of cables, together with the proposed method of installing the cables and all equipment. Submit drawings for approval prior to placing cable and equipment orders with any manufacturer.
- Typical published test data showing physical and electrical characteristics of the proposed submarine cable insulating compound.
- Manufacturer's construction drawings of all submarine cables showing the sizes of conductors, thickness of insulation, makeup of the cable layers, type and size of jackets, armor, jute serving and other components, and the outer diameters of the finished cables.
- Detail drawings showing the construction of the submarine and terminal boxes and cabinets and all equipment and components mounted therein. Terminal and wire tagging must be shown prior to cable installation.
- Submit calculations and locations of heaters within each motor drive, programmable logic controller and termination cabinet. Provide thermostats that are internal to each self-contained heater unit. Size each heater unit per the internal space of each terminal cabinet, and per heater manufacturer's recommendations.

Provide Manufacturer's data sheets (including type, length, and minimum bending radius), certified test data, and cross section drawings for each cable. Provide manufacturer's data sheets for each type of cabinet, heater, terminal block, ground bar(s), and other devices within each cabinet. Provide detailed dimensioned drawings for termination cabinets including terminal/wire number designations, cable routing, cabinet and cable support devices and mounting details. Submit drawings showing configuration of conduits and devices entering submarine cable termination cabinets, and detailed layouts of terminal blocks within submarine cable termination cabinets. Submit details of termination cabinets, showing dimensions, segregation shields, and mounting arrangement of all equipment. Provide electrical schematics and system diagrams showing all system wiring. Provide dimensioned drawings that detail all surrounding mounting walls and structures. Where existing cables and conduit penetrations are to be re-used, provide details of how the new cables, conduits and fittings are to be installed. Where new submarine cables route through new or existing penetrations sleeves, provide details on sealing the openings.

C.4 Wiring Devices

Provide devices installed outside of control house with corrosion-resistant metal weatherproof covers. Furnish cover plates with 1/8 mm thick satin finished Type 302 stainless steel that fit Type FS or FD boxes without overlapping edges or comers.

C.5 Terminal Block Requirements

Provide terminal blocks with white marking strips. Group them for easy accessibility unrestricted by interference from structural members and instruments. Provide two (2) inches, minimum on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block. Do not terminate more than two wires on any one terminal position. Permanently label each terminal block, device, fuse block, and both ends of each conductor to coincide with the identification indicated on the manufacturer's wiring diagrams.

C.6 Electrical Identification (Nameplates)

Degrease and clean surfaces to receive nameplates and tape labels. Install nameplates and tape labels parallel to equipment lines. Secure nameplates to equipment fronts using a minimum of two (2) stainless steel screws or approved manufacturer's recommended adhesive. Secure nameplates to inside of recessed panelboard doors in finished locations.

Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings for control wiring.

C.7 Supporting Devices

Do not fasten supports to piping, ductwork, mechanical equipment, or conduit. Do not drill any holes in any structural steel or concrete members without approval of engineer. 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 monel metal, bronze, or stainless steel. Use hexagonal bolt heads and nuts with spring lock washers under all nuts. Use minimum 3/8-inch diameter bolts except as may be necessary to fit the mounting holes in small devices, outlet boxes, and similar standard equipment.

Fasten hanger rods, conduit clamps, and outlet and junction boxes to structure using proper fasteners. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchors on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction. Attachment to steel or concrete shall be by stainless steel straps or hangers held at not less than two points by galvanized bolts or lag screws. Concrete inserts shall be fabricated from stainless steel. Install surface-mounted cabinets and panelboards with a minimum of four anchors. Do not use powder-actuated anchors. Do not drill or weld structural steel members.

C.8 Motors

Megger all motors before final connection. Record these readings and submit with "as-built" drawings at time of functional testing. Coordinate motor shaft diameters and lengths with requirements for machine and service brakes. Before ordering motors, verify that the sizes and lengths of all shafts, location of conduit boxes match the requirements for the brake and mechanical equipment furnished.

C.9 Conduit and Wiring

Unless otherwise specified in the plans, install conduit according to National Electrical Contractors Association (NECA) Standard Practice. Install nonmetallic conduit according to manufacturer's instructions. Arrange supports to prevent misalignment during wiring installation. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers. Do not use plastic straps or plastic hangers. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits. Fasten conduit supports to building structure and surfaces under provisions of supporting devices. Attachment to steel or concrete shall be by galvanized or stainless steel straps, hangers held at not less than two points by galvanized, stainless steel bolts, or lag screws. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary support.

Provide pull boxes or junction boxes wherever necessary to facilitate the installation of the conductors. Pull boxes are used for pulling conductors through. No splicing or terminations are permitted. Junction boxes shall be used for field connections of conductors. Conductors are to be connected using approved terminal blocks. Do not use condulets for pulling more than 10 conductors or for making such turns in conduit runs or for branching conductors, except for indoor wiring to lighting fixtures and receptacles. At any point where a conduit crosses an expansion joint, or where movement between adjacent sections of conduit can be expected, install a bronze or alloy expansion fitting.

Use of flexible conduit is allowed only for the connection of motors, limit switches, and other devices that must be periodically adjusted in position. Make connections between the rigid conduit system and all motors, and limit switches with flexible conduit with couplings and threaded terminal fittings. Do not exceed 2 feet in length for flexible conduit extensions. Install flexible conduit with bonding jumpers and arrange to drain away from the device it serves.

Provide at both ends of each conduit run a brass tag having a number stamped thereon according to the conduit diagrams. Secure and permanently fasten these tags to the conduit ends with bare copper wire. Run concealed in walls, ceiling, or floor conduits in the control room. Run exposed conduits in the bascule piers. Where conduits pass through the floors or walls of the control room, provide galvanized rigid conduit sleeves for free passage of the conduits. After the conduits are installed, caulk openings with an elastic compound and provide escutcheon plates on the interior walls, ceilings, and floors for airtight fits.

Arrange conduit to maintain headroom and present neat appearance. Route exposed conduit parallel and perpendicular to walls. Route conduit in and under slab from point-to-point. Maintain adequate clearance between conduit and piping. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104 °F.

Connect conduit sections to each other with threaded couplings. Install conduits 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 when the work is temporarily suspended.

Conduits mounted exteriorly on parts of the steel work must be set not less than 1½ inch clear from the supporting structure to prevent accumulation of dirt. Space parallel horizontal conduit 1 inch apart and securely clamp to the steel work to prevent rattling and wear. The clamps, in general, shall consist of U-bolts attached to angle or channel iron supports bolted to the members. The spacing of the clamps shall not exceed 6 feet of spacing.

Cut conduit square using saw or pipe cutter; de-burr cut ends. Bring conduit to shoulder of fittings; fasten securely. Long running threads will not be permitted. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum. Embedded conduit stub-outs shall be provided with threaded 316 stainless steel.

Use conduit hubs to fasten conduit to sheet metal boxes. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2 inches. All field bends shall be long sweep, free from kinks, and of such easy curvature as to facilitate the drawing in of conductors without injury to the conductors. Make conduit runs with as few couplings as standard lengths will permit.

Avoid moisture traps; provide junction box with drain fitting at low points in conduit system. Install all conduits so that they will drain properly and provide drainage tees at low points where required. Provide suitable pull string in each empty conduit except sleeves and nipples. Use suitable caps to protect installed conduit against entrance of dirt and moisture. Carefully clean all conduits 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 eighty percent of the nominal inside diameter of the conduit, and draw in the conductors. Identify conduit under provisions of the Electrical Identification section of this special provision.

C.10 Conductors

Do not splice conductors (except for "pigtail" leads and lighting circuits). Use solderless pressure connectors with insulating covers for wire splices and taps, No. 8 AWG and smaller, for lighting circuits. Make lug connections with high-pressure indent connector tools as recommended by the lug manufacturer. Use split bolt connectors for wire splices and taps, No. 6 AWG and larger, and all motor connections or other approved method.

Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor. Make splices and taps to carry full ampacity of conductors without perceptible temperature rise. All splices shall be waterproof. Terminate spare conductors with electrical tape.

Neatly train and lace wiring inside boxes, equipment, and panelboards. Place an equal number of conductors for each phase (three-phase system) of a circuit in same raceway or cable. Make conductor lengths for parallel circuits equal. Pull all conductors into a raceway at the same time. Use soap base wire pulling lubricant for pulling No. 4 AWG and larger wire. Tighten all connections to manufacturer's recommendations. Take precautions to avoid "sawing" through PVC conduit. Pull ropes shall be braided. Bare conductors shall not be pulled through PVC conduits. Conduit shall be swabbed with lubricant prior to pulling the conductors.

Identify wire and cable under provisions of Electrical Identification. Identify each conductor with its circuit number or other designation indicated on plans.

C.10.1 Conductor Tests

Test each circuit for continuity and short-circuits for its complete length before being connected to its load. Verify identification numbers for the entire length of the circuit. Inspect wire and cable for physical damage and proper connection. Perform insulation testing on all power conductors.

C.10.2 Insulation Resistance Test

Perform insulation resistance test (wire-to-wire and wire-to-ground) at 1,000 VDC for one minute. Minimum insulation resistance for new cable shall be 100 mega-ohms or greater.

When insulation resistance must be determined with all motor control centers, panelboards, switches, and over current devices in place, the insulation resistance when tested at 500 VDC shall be no less than 50 mega ohms. Test results shall be recorded and witnessed by the engineer. Submit test results to the engineer for review prior to energizing the circuit. Include a table of the test results with the "as-built" drawings with additional columns left blank for future readings to be recorded.

C.11 Luminaires

Construct, wire, and install all luminaires in compliance with all applicable national, state and local codes.

C.12 Fire Alarm / Burglary System

Provide UL listed addressable fire alarm control panel (FACP) and Burglary prevention system that meets the requirements of NFPA-72. Provide the required number of addressable devices as shown on plans. Zones or areas shall be installed on a common system. Power supplies including surge protection shall be housed in a NEMA-12 cabinet.

The system shall be able to include a combination of 24-hour, perimeter or interior detectors or notifiers triggered by unlatched door contact when the system is security mode. Security mode shall be able to be overridden via a keypad located by the main entrance of the east tower.

Contractor to contact the local fire marshal office for remote communications. Provide the required communication hardware to allow the system to be monitored by the local fire Marshall office as required by the local jurisdiction.

Fire Alarm and Burglary system shall be as manufactured by Honeywell Model Vista-32FB or approved equal.

D Measurement

The department will measure Bridge Electrical Work as each unit for the work, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.025	Bridge Electrical Work	EACH

Payment is full compensation for furnishing and installing the electrical components, control system, and documentation for the bascule span.

61. Span Drives and Motors, Item SPV.0060.026.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, transporting, installation, testing, and making fully operational span motor drives for the Cherry St. Bridge.

A.1 Scope

The work under this item includes the following:

Furnish and install two matched motor and vector controlled variable speed drive (VSD) assemblies as described in this article. The motor and drive assemblies shall be coordinated by the drive manufacturer.

Provide each assembly with two VSDs, two line reactors, two across the line starters for motor brake controls, circuit breakers, control relays, selector switches, indicator lights, terminal blocks, two isolation transformers and miscellaneous hardware as shown in the plans and as required to complete the design in order to function as described in this article. Provide assemblies that are capable of standalone operation with contact closure inputs from the Bridge Control System and limit switches.

A.2 References

IEEE 112 – Test Procedures for Polyphase Induction Motors and Generators

NEMA MG 1 – Motors and Generators

NEMA MG 2 – Safety Standards for Construction and Guide for Selection, Installation, and Use of Electric Motors and Generators

A.3

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Control Console - Cherry Street
- PLC Controls - Cherry Street
- PLC and Communication Modifications – Cherry St. bridge and Knapp St. bridge.
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable
- Architectural Exterior Bridge LED Lighting

B Materials

B.1 General

Each span drive is a complete system that includes the motor, AC drive, dynamic braking resistors, , disconnect, cabinet, metering and miscellaneous equipment necessary to meet the performance requirements of this specification. Design the span drive system to comply with AASHTO Conditions A and C. Power ratings given in the plans and specifications are for general reference only. The supplier is responsible for ensuring that the Variable Speed Drive (VSD) and motor package is properly sized to accommodate the speed and torque requirements of the project.

Design system for a one motor operation that meets AASHTO condition A requirements. This will be the normal operation condition of the bridge. In the event condition C loads are encountered, design a master-slave configuration that uses the East drive as the master speed with the west drive as a current follower. Use a selector switch on control desk to select between: East; West; Both; Alternate Motors (normal operations).

The torque requirements shown in plans are defined as follows:

Starting Torque is defined as the torque required to accelerate the movable leaf against loads from wind, unbalance, friction, and inertia. Drive rating shall provide for this torque for a minimum time period of 20 seconds.

Running Torque is defined as the torque required to move the span against loads from wind, unbalance, and friction. Drive rating shall provide for this torque for an indefinite period of time for normal, AASHTO Condition "A" wind loading and for a minimum time period of two minutes for AASHTO Condition "C" wind loading.

Dynamic Braking Torque is defined as the torque required to retard leaf movement against overhauling loads from wind and unbalance. Drive rating shall provide for this torque for a minimum time period of three minutes.

B.2 AC Motors

The motor shall be provided by drive manufacturer to assure compatibility and drive system integration.

Provide TEFC, NEMA Design B motors, stainless steel shaft. The motors shafts shall be stainless steel. The machinery end of shaft shall have a closed keyway. Coordinate motor coupling and installation details with the machinery manufacturer. Provide approved shop drawings to the machinery manufacturer for their use in the machinery assembly drawings. The motor(s) shall have the following characteristics:

The motor shall be rated for inverter duty and suitable for use in a vector controlled variable speed drive application.

Provide a through shaft type encoder with two output connectors.

Start-Ups: 12 per hour. 2 per ten minute period.

Power Output, Locked Rotor Torque, Breakdown or Pullout Torque:

Design, Construction, Testing, and Performance: Conform to NEMA MG 1.

Insulation System: NEMA Class F or better.

Testing Procedure: According to IEEE 112, Test Method B.

Load test motors to determine freedom from electrical or mechanical defects and compliance with performance data. Perform additional testing to determine speed/torque curve relationship.

Motor Frames: NEMA Standard T-frames of steel or cast iron (no aluminum frames allowed) with end brackets of cast iron with steel inserts.

Over Temperature System (Motor Sizes 25 HP and Larger): Three PTC thermistors imbedded in motor windings and epoxy encapsulated solid state control relay for wiring into motor starter.

Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for future lubrication, rated for minimum AFBMA 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.

Sound Power Levels: To NEMA MG 1.

Nominal Efficiency: Meet or exceed values in Schedules at full load and rated voltage when tested according to IEEE 112.

Ship motors to a facility for dynamometer testing with the variable speed drives.

B.3 Span Drives

Design, fabrication, and performance requirements for Variable Speed Drive (VSD):

This is a functional specification and horsepower rating is deliberately not specified. The manufacturer shall size the motors and drives to provide the torque and speed requirements as shown in the plans.

Design the VSD system to provide reversing, continuous speed adjustment with acceleration and deceleration control, of three-phase motors without exceeding the specified maximum motor and machinery torque. Provide an VSD system capable of supplying power to the motor(s) for the required motor torques. Provide a control capable of providing selectable current limit settings. Provide a drive that is able to withstand output terminal line-to-line short circuits without component failure, be insensitive to input line rotation and capable of power ride-through of 15 mS at full load.

Furnish drive with internal over temperature protection. D. 115 VAC input control logic board option. Provide inputs that include, enable, run, reverse, and full speed. Provide a drive that is able to respond to inputs with preset direction and speed to accelerate and decelerate the bridge leaf to follow a trapezoidal speed curve as shown in the plans.

Contact outputs: 4 form "c" min. (functionally programmable). Provide outputs that include overload alarm, drive fault, and brake release.

Provide dynamic braking function (with power resistors) capable of 100% braking of full load motor torque for 3 minutes.

Provide drives capable of converting incoming three-phase, 460 V (-10% of min. +10% of max.) and 60 Hz (± 2 Hz) power to a variable potential DC bus level. The DC voltage shall be inverted to pulse width modulated waveform with an adjusted 0 to 420Hz frequency output.

Ensure displacement power factor ranges between 1.0 and .95, lagging over the entire speed range.

Provide VSD capable of operating, without de-rating, in an ambient temperature of 0 degrees C. to 40 degrees C., an altitude of up to 3,300 feet above sea level, and humidity of 5% to 95%, non-condensing.

Provide VSD capable of remote monitoring of motor voltage, current, frequency, and diagnostic performance data utilizing Ethernet communication. Provide analysis software for integration with the Integrated Bridge control system monitor display.

Furnish a dry type isolation transformer, for external mounting, with "wye" connected secondaries, for each assembly.

Provide VSDs in NEMA 12 enclosures with complete front accessibility with easily removable assemblies. Floor mounted enclosures shall have open bottoms except for a 2" mounting flange.

Include the following items in the VSDs enclosures:

Feeders disconnect: Input AC circuit breaker or fused switch with an interlocked, pad lockable handle mechanism.

Isolated process follow input and output.

Motor brake contactor. Drive shall provide torque proving to control brake output contact.

Brake chopper module for control of Dynamic Braking Resistors. Resistors shall be mounted externally.

Electronic over current trip for instantaneous and inverse time overload protection.

Human interface module with START-STOP pushbuttons, power ON indicating light, and speed control potentiometer, door mounted.

Human interface module with alphanumeric display of run, stop, forward, reverse, fault, over frequency, instantaneous over current, DC over voltage, AC under voltage/loss of phase, emergency stop, overload, over temperature, inverter pole trip, and stand-by modes, door mounted.

HAND-OFF-AUTO selector switch. This H-O-A will select between "A" motor "B" motor or both, and be mounted inside the drive cabinet.

Run, fault, and control power indicators, door mounted.

Electrical isolation between the power and logic circuits, as well as between the 120 VAC control power.

Line transient voltage protection.

Line reactors, if required. Motors on the far side will be located approximately 300 feet from the drive cabinet.

Provide the following independent adjustments on the VSD:

Output frequency range: 0 to 400 Hz.

Programmable current limits from 20-160% of rated current.

Acceleration time: 0-3600 sec. with two independently programmable timers.

Deceleration time: 0-3600 sec. with two independently programmable timers.

Start boost control.

Volts per Hertz – programmable for start boost, run boost, slope, and custom operation.

Slip compensation speed regulation to 0.5%.

VSD run, fault, and control power indications shall be visible with the controller door closed. The VSD reset button shall be part of the human interface module. Faults shall be remotely re-setable from a "clear fault" input line of the VSD.

Enclosure Construction: Furnish two ground lugs, one for incoming line power and one for outgoing motor ground connections. Provide enclosures no less than 16-gauge steel and finished in standard manufacturer's finish.

B.4 Cabinet

Provide heavy duty free standing NEMA type 12 enclosures manufactured with 10-gauge steel. Furnish enclosure with a flange mount or through the door disconnect. Apply a baked powder coat gray finish on the outside and white finish on the inside of the enclosure.

Furnish two ground lugs, one for incoming line power and one for outgoing motor ground connections. Furnish and install vents or fans to dissipate heat generated by the drives.

B.5 Encoder

Provide a severe mill duty incremental encoder that can be foot mounted with the following minimum requirements.

- Compatible with AC Drive

- Minimum 1024 pulses per revolution (PPR)

- 12-15 VDC Driven

- 40°C to 80°C

B.5 Line Impedance and Isolation

Install, as a minimum, isolation transformers on the line side of the ASD drive controller. Install other passive filters and traps on the line side of the ASD drive controller to ensure proper protective device coordination, harmonic damping, and compliance with IEEE 519.

B.6 Assembly Materials

Provide cabinets and components that conform to materials described in Section T508-8 Integrated Bridge Control System.

Provide circuit breakers and across the line motor starters that conform to the materials described in Section T508-5 Motor Control Center.

B.7 Spare Parts

Furnish the following additional parts for the Variable Speed Drive motor controller (Furnish the parts in their original containers or boxes):

- One each main control board

- One power interface board

- One gate board driver

- One diode power block

- Six incoming line fuses

- Six control power fuses

- Three complete pilot light assemblies; one red, one green, one white

- One complete three position selector switch assembly with 2NC and 2NO contact blocks.

- One complete lighted pushbutton assembly with red lens and 2NC and 2NO contact blocks.

- One complete set of ventilation air filters for cabinet.

C Construction

C.1 General

Coordinate motor frame size with brake and mechanical manufacturers. Install motors per manufacturers' instructions. Install motor mounting bases as required to accommodate motors. Properly align motor shaft with driven shaft before connecting motor coupling. Align if required. Megger motors before final connection. Record these readings and submit with "as-built" drawings. Connections shall be accomplished with bolted compression lugs.

C.2 Factory Load Testing

Before shipping, conduct a factory design proof test on each drive and motor system with a calibrated dynamometer to verify that the performance requirements have been met. The test will be witnessed by the engineer. Provide 30-day advanced notice and submit description of the test stand to document the accuracy of the torque readings.

Supply test results to confirm that the VSD has been tested to substantiate designs according to applicable ANSI and NEMA Standards. The tests shall verify not only the performance of each unit and integrated assembly, but also the suitability of the enclosure venting and rigidity. All units shall be factory tested according to ANSI standards in addition to the design proof tests conducted on all units.

Testing procedures shall include:

- Apply loads equal to the torques specified for AASHTO Condition A to motor shafts. Run motor at 100 percent speed for three minutes (driving). Motor-drive combinations should be capable of driving the load.
- Apply overhauling loads equal to the AASHTO Condition A torque to motor shafts. Run motors at 100 percent speed for three minutes (dynamic braking). Motor-drive combinations should be capable of dynamically braking the load.
- Demonstrate that motors/drive cannot produce or exceed the never-exceed torque value at zero or any other speed. NOTE: Zero speed is defined at 0-20 RPM max.

Make final adjustments to installed drive to assure proper operation of fan system. Obtain performance requirements from installer of driven loads. Touch up scratched or marred surfaces to match original finish. Demonstrate operation of controllers in automatic and manual modes.

C.3 Shop Control Testing

Interconnect both drives and motors with the entire control system. Demonstrate the operation of both drives using the control system. Demonstrate the following in an unloaded condition during the shop test:

C.3.1 Requirements:

The contractor shall assemble, configure and pre-test the entire control system to be installed as shown on contract drawings including but not limited to the Motors, Motor Drive Cabinets, local control console, PLC cabinet and remote PLC hardware in their shop facilities. The test should assure completeness and correct operation of the entire bridge control system. For existing devices located in the Knapp bridge such as the remote-control console and HMI, the contractor shall provide temporary devices that simulate such hardware.

The Control system to be tested shall be wired into a simulator panel or system just as the system would be wired on the actual bridge. The simulator system shall be designed to give clear and precise representation of an actual working bridge. The layout of the simulator system shall replicate the layout of all the control system elements of the bridge including but not limited to various limit switches, traffic lights, etc.

The shop testing shall be set up such that the simulation system shall be manipulated to react to the operator just as the bridge would react in real time on the bridge itself. As specific operator commands are issued, lights or graphic symbols on the simulator system shall illuminate to show the command and desired reactions of the system.

The testing shall include:

Normal operation of the bridge

- Independent functionality of the bridge
- Maintenance including interlock and by-pass as indicated on the contract plans.
- Traffic signals and gates
- Span Locks
- Span Rising / Lowering
- Speed changes for both raising and lowering for each motor/drive in one motoroperation
- Speed changes for both raising and lowering for in two (2) motor operation.
- Speed set-point and ramp programming changes from HMI setup screen.
- Normal Stop sequence
- Emergency Stop sequence.

Remote control Operation from the Knapp St. Bridge remote State St. control console.

D Measurement

The department will measure Span Drives and Motors as each unit bid items, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.026	Span Drives and Motors	EACH

Payment is full compensation for furnishing and installing span drives.

62. Control Console – Cherry Street, Item SPV.0060.027.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, testing, and making fully operational a PLC system for the South Cherry St. Bridge.

A.1 Related Provisions

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable

B Materials

B.1 Cabinet

Provide heavy NEMA type 12 enclosures manufactured with 10-gauge steel. Apply a baked powder coat gray finish on the outside and white finish on the inside to the enclosure. Size shown on drawings is an estimated size. Verify final sizing and coordinate size of cabinet with building accesses.

B.2 Hardware

B.2.1 Indicating Lights

Use 30.5 mm push-to-test industrial heavy-duty, oil tight NEMA 13, 120 V transformer type, with LED bulbs. Lens colors are as indicated on plans.

B.2.2 Pushbuttons

Furnish single button operator with one normally open (1 N.O.) and one normally closed (1 N.C.) momentary contact, 30.5 mm corrosion resistant, heavy duty, oil tight pushbuttons.

B.2.3 Selector Switch

Supply selector switches with a lever operator knob, one N.O. and one N.C. contact in each position. Provide switches that are 30.5 mm corrosion resistant, heavy duty, and oil tight. Provide key switch operator where required.

B.2.4 Key Operated Selector Switch

Supply Square D style selector switches with a keyed operator, no equivalent with one N.O. and one N.C. contact in each position. Provide switches that are 30.5 mm corrosion resistant, heavy duty, and oil tight.

Power type switches shall be keyed to MD1. All bypass type switches shall be keyed to MD2.

B.3 Contact Blocks

Provide contact blocks rated at 10 A, NEMA Class A300. Blocks are to be clear to allow visual inspection and are oil-tight.

B.4 Span Control Joystick

Furnish and install rugged compact joystick controller with single axis operation with the following minimum requirements.

0° neutral and 1-0-1 to 6-0-6 detented positions.

Mechanical Life - 10 million cycles.

10A resistive, 4A inductive contacts.

4.3" shaft handle with boot.

Furnish controller with a handle interlock for movement and a detent for each position.

Spring return to center.

Configure controller per the design plans.

B.5 Pistol Grips

Pistol grip rotary switches will be 3-position with spring return-to-center capability. Rotary contacts are to be double sided and knife type. There will be terminal screws for easy installation. All connections are finger safe. Contacts are to be rated at 10 A.

B.6 Meters

Furnish red LCD programmable digital displays with 4½-digit resolution. Furnish meter with a minimum of 0.48-inch high digits, programmable decimal points and a NEMA 4x sealed front bezel.

They will have vertical orientation with colored bars for easy viewing. There is to be peak and valley hold capability and trend indication for signal direction. There will be an accuracy of at least 0.1 percent of full scale.

B.7 Legend Plates

Legend plates are to be rectangular and manufactured out of laminated plastic or any similar non-metal corrosion resistant material. Provide ½-inch black lettering on a white background.

B.8 Heavy Duty Foot Switch

Provide a heavy duty foot switch as manufactured by DAYTO model 6GPE8. Provide the required hardware to mount foot switch to lower section of control console.

C Construction

C.1 Cabinets and Enclosures

Clean and phosphatize internal and external surfaces prior to application of high-quality rust inhibiting primer. Apply finish coat of light gray ANSI No. 61 baked enamel or polyester powder. Finish back panel with gloss white lacquer over suitable primers.

C.2 Wiring

Provide interconnection wiring between all electrical devices mounted in the panels and enclosures. If the devices are to be connected to external equipment, connect them to terminal blocks. Provide conductors that are UL listed type THWN-MTW. The minimum field installed control wire within the control console is No. 16 AWG. Everywhere else, use No. 14 AWG minimum wire size.

Install all interior wiring neatly and carefully, and terminate on UL approved terminal blocks as per manufacturer's instructions. Individually bundle wiring to each control switch and install with a "drop loop" of sufficient length to allow for its removal for maintenance without disconnecting the wiring. Use plastic wireways (open slot type) for routing all internal wiring in the control panels. Internal wiring in the factory prewired electronic system cabinets may be installed according to the manufacturer's standard as to wire size, insulation, and method of termination on internal equipment.

Permanently identify individual conductors. The marking will be done on a sleeve not less than ½ inch long. Mark each sleeve with permanent and waterproof identification. Do not use adhesive-type labels.

C.3 Terminal Blocks

Group for easy accessibility unrestricted from structural members and instruments. Provide sufficient space (2 inches minimum) on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block. Do not terminate more than two wires on any one terminal position.

C.4 Marking and Labeling

Each terminal block, device, fuse block, terminal, and both ends of each conductor will be permanently labeled to coincide with the identification indicated on the manufacturer's wiring diagrams. Terminal blocks and devices already numbered in the plans are to be so numbered on the equipment supplied. Mounted electronic components are to be identified by marking with contrasting colored ink beside the component.

D Measurement

The department will measure Control Console – Cherry Street as each unit bid item, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.027	Control Console – Cherry Street	EACH

Payment is full compensation for furnishing and installing a new control console.

63. PLC Controls – Cherry Street, Item SPV.0060.028.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, testing, and making fully operational a PLC system for the South Cherry St. Bridge.

A.1 Scope

The work under this item includes the following:

- New PLC cabinet with all PLCs, relays, terminals, and miscellaneous equipment mounted and wired complete.
- Programming Software for PLC
- PLC programming for local control of bridge.

A.2 Related Provisions

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable

A.3 Control System Drawing Preliminary Review

Control logic drawings have been developed to include PLC and relay logic to control the bridge.

Prior to developing the logic at the PLC software and relay logic levels, the contractor is required to do a preliminary review of the control logic drawings and provide the engineer with comments if necessary.

The control logic as provided under this contract do not relieve the contractor from coordinating with the engineer for any revisions or omissions not found during the preliminary shop drawings review and during the equipment procurement process.

Any hardware omissions not found during the preliminary control system review, shall be included in the hardware commissioning process at no additional cost to the owner.

B Materials

B.1 Cabinet

Provide heavy NEMA type 12 enclosures manufactured with 10-gauge steel. Apply a baked powder coat gray finish on the outside and white finish on the inside to the enclosure. Size cabinet to fit in same location of the entry level.

B.2 Programmable Logic Controller (PLC)

Provide a PLC system manufactured by a single source and that will be the product of a company with a minimum of five years of experience in the manufacture and service of this type of equipment. The PLC systems must have the communication capability to communicate and program drive parameters and settings. The PLC must be compatible with the PLC system at the Knapp St. Bridge remote State St. bridge for remote operation.

Provide the PLC processor with a minimum of two (10) Mb user memory, compact-flash nonvolatile user memory a built in communication port, extensive instruction set and ladder logic programming capability.

Provide the PLC system with Ethernet communications, hubs and switches, input and output modules and communication modules.

Provide I6 point digital input cards rated for 120 VAC. Provide output cards rated at 120 VAC. Provide 16-point output cards having a minimum 0.5 A per point rating. Individually isolate relay output cards with a rating of 2 A continuous. Supply input and outputs modules with 20 percent spares

PLC shall be as manufactured by Rockwell Automation, Allen Bradley Model 1756 with Control Logix 5580 controller (1756-L83EK), Redundancy Module, Ethernet module, and all the required power supplies, chassis, input, output modules and ancillary devices and accessories for a complete PLC control system. Power supplies and chassis shall be sized as required to hold the number of devices needed for a complete system.

B.3 Relays, Timers and Contactors

Furnish relays, timers and contactors that are listed and classified by UL as suitable for the purpose specified and indicated.

B.3.1 Relays

Provide ice cube type control relays for non-load carrying control circuits. Relays will be rated for 120 VAC with a minimum contact rating of 10 A. Provide all relays with LED indicating lamp across coil. Relays will be Allen Bradley 700-FS, Square D 8501 type K, Cutler Hammer D5 series or approved equal.

For load carrying circuits and latching circuits less than 10 A, provide industrial control/machine tool relays with contacts rated at a minimum of 20 A. Relays will be Allen Bradley 700-P, Square D 8501 type X, Cutler Hammer D26 series or approved equal.

B.3.2 Timers

Provide solid state multifunction timers. Timers will be rated for 120 VAC. Timers will be Allen Bradley 700-H, Square D RE7, Cutler Hammer TR series or approved equal.

B.3.3 Contactors

For all lighting loads, provide contactors with a minimum of 20 A tungsten contacts. Contactors are to be Allen Bradley, Square D, Cutler Hammer or approved equal.

B.4 Circuit Protection

B.4.1 Supplemental Protectors

Provide single pole UL listed or recognized miniature thermal magnetic circuit breakers. Provide breakers that are track mountable with a positive trip-free holding mechanism and a 10 kA interrupting rating.

B.4.2 Control Fuses

Provide ferrule end type, ceramic or fiberglass body, midget type, rated 250 VAC, 10 kA interrupting, UL listed for control circuit application. Automotive type, glass body fuses are not acceptable. Provide fuse blocks to house the control fuses. Provide terminal block style with isolating feature, and rail mounted, rated 600 VAC, 30 A maximum for midget type fuses. Provide a hinge type cover for isolating and automatic fuse extraction from circuit when cover is lifted.

B.5 Uninterruptible Power Supplies (UPS)

Provide backup power to the PLC power supply, Ethernet switch and HMI by a computer type on-line UPS.

Provide self-contained UPSs with battery chargers, internal battery banks, local controls, and on-line inverters that provides continuous power output when incoming power is lost. Loss of output power is unacceptable during loss of input power. Size UPSs to provide power for full load connected plus 25 percent (minimum) for a total of 20 minutes continuous output power at 120 VAC. Provide built in surge protection.

B.6 Human Machine Interface (HMI)

Provide all labor, materials, configuration, programming and place into satisfactory operation the HMI as described herein and as shown on Contract Drawings.

HMI shall be as manufactured by Rockwell Automation, Model Panel-View 5510 or approved equal.

Program and configure graphic screens with color animation of major devices on screen to indicate status of signals, gates, barrier, rear locks and span. Configure the HMI to log and display historical components status and alarms. Signals will be received from the new local PLC(s). Submit color copies of each screen for approval prior to testing.

C Construction

C.1 Cabinets and Enclosures

Make all PLC equipment accessible through the front doors of the enclosure.

Clean and phosphatize internal and external surfaces prior to application of high-quality rust inhibiting primer. Apply finish coat of light gray ANSI No. 61 baked enamel or polyester powder. Finish back panel with gloss white lacquer over suitable primers.

C.2 Wiring

Provide interconnection wiring between all electrical devices mounted in the panels and enclosures. If the devices are to be connected to external equipment, connect them to terminal blocks. Conductors are to be UL listed type THWN-MTW. The minimum field installed control wire within the control console is No. 14 AWG.

Install all interior wiring neatly and carefully and terminate on UL approved terminal blocks as per manufacturer's instructions. Use plastic duct (open slot type) for routing all internal wiring in the control panels. Internal wiring in the factory prewired electronic system cabinets may be installed according to the manufacturer's standard as to wire size, insulation, and method of termination on internal equipment.

Permanently identify individual conductors. The marking will be done on a sleeve not less than ½ inch long. Mark each sleeve with permanent and waterproof identification.

C.3 Terminal Blocks

Group for easy accessibility unrestricted from structural members and instruments. Provide sufficient space (2 inches minimum) on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block. Do not terminate more than two wires on any one terminal position.

C.4 Marking and Labeling

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 in the plans will be so numbered on the equipment supplied. Identify mounted electronic components by marking with contrasting colored ink beside the component.

D Measurement

The department will measure PLC Controls – Cherry Street as each unit bid items, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.028	PLC Controls – Cherry Street	EACH

Payment is full compensation for furnishing and installing a PLC cabinet.

64. PLC and Communication Modifications – Knapp Street (Bridge B-40-62), Item SPV.0060.029.

A Description

Under this item design, program, configure, furnish, install, test, and place in satisfactory operating condition the complete remote bridge controls, CCTV monitoring and control and communication systems for the Cherry St. bridge from the Knapp St. Bridge remote site. Refer to contract drawings for additional requirements.

The contractor shall furnish and install a new fiber optic backbone including ancillary installation hardware between the Cherry St. Bridge control room and the Knapp St. Bridge control room.

The remote bridge control work includes modifications to the existing State Bridge remote control console.

The remote CCTV monitoring and control includes modifications to the existing Wells St. Bridge remote control console and furnishing and install additional equipment to interface with the existing CCTV monitoring system at the Knapp St. Bridge.

Remote intercom communications include furnishing and installing additional equipment to interface with the existing network equipment at Knapp St. Bridge.

The work should include controls, CCTV and communications hardware field start up services, spare parts, and all required provisions for a complete functional system with all necessary accessories.

The contractor shall coordinate with the proposed equipment supplier for 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 city.

A.1 Related Provisions

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC Controls - Cherry St.
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable

B.1 Drawings and Specifications

B.1.1 General

The contractor shall create and submit drawings or as-builts for each site to detail the contractor's installation. Omissions from the contractor installation drawings, or the mis-description of details of work which are evidently necessary to carry out the intent of the drawings, or which are customarily performed, shall not relieve the contractor from performing such omissions and details or work. 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.

B.1.2 Equipment Locations

The contractor prepared layout drawings shall show, in general, the arrangements and location of equipment at each location. 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.

B.1.3 Circuit-and-Raceway Schedules

Existing information on controls, CCTV and networking hardware including power sources can be obtained from the Knapp St., Wells St., and State St. Bridges Operation and Maintenance Manuals, existing plans, and site inspections.

B.1.4 Submittals

Within 45 days after execution of the contract, shop drawings shall be submitted to the engineer for all equipment. No equipment is to be purchased without approved shop drawings. Prepare as necessary all shop drawings pertaining to the bridge systems before submitting these to the engineer for review.

Shop drawings shall include manufacture's test data, shall be certified by the manufacturer, and shall identify the application for which they are proposed.

Layout drawings showing all equipment installation locations and wiring diagrams shall be provided as applicable and include any modifications to existing components.

Working drawings shall be made on standard 11 in. x 17 in. sheets. Catalog cuts and manufacturer's standard drawings shall 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 contractor prepared 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 according to 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.

B.1.5 Quality Assurance

Installer Qualifications: Manufacturer's authorized electrical supervisor representative who is trained and approved for installation of the hardware required for this Project. As a minimum, the contractor shall assign an individual who is certified as a fiber optic technician, with additional qualifications for the installation of CCTV and communication systems shown on this contract who will oversee the installation of the hardware as specified and shown on this contract.

Manufacturer Qualifications: The companies specializing in manufacturing the products specified shall have a minimum of five years of documented experience.

B.1.6 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. 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 owner and engineer as-built plans showing in detail all installations, especially installation location, wire/conduit routing, size of conduits, complete schematic circuit diagrams and the like.

If required, 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.2 General

The Electrical Equipment and its installation shall be according to regulations of the NEC 2020 edition and the American Association of State Highway and Transportation Officials except as otherwise provided herein.

All materials and equipment furnished under these specifications shall be new and, unless indicated elsewhere, to the extent possible, standard products of the various manufacturers. Where more than one of any specific items 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, CCTV or communications equipment and apparatus shall have a permanent 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 firm to have complete responsibility for the detailed design, integration, programming, and installation of all system components in order to ensure a complete system is furnished and installed according to the requirements of this project. The qualified firm 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 associated equipment. Components associated with the system include but shall not be limited to cabinets, cabinet modifications, console modifications, programmable controllers and associated hardware, ethernet switches, CCTV equipment, computers, microphones, speakers, and any interfacing equipment as may be required.

All ferrous metal work shall be hot-dip galvanized according to 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.

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.3 Shop Drawings

Within 45 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 new or modifications to existing cabinet enclosures, panel boards, transformers, switches, raceways, conductors, wiring devices, 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 qualified firm shall review, coordinate, and prepare as necessary all shop drawings pertaining to the 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 new cabinets or modifications to existing cabinets.

Submit shop drawings for installation and mounting details of switches, fixtures, and devices.

Working drawings shall be made on standard 11 in. x 17 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 according to 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 city two sets of as-built drawings reflecting all changed or modifications made from the contract drawings having to do with the finished system. One set of as-built drawings will be given to the city.

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. Refer to section B1 above for additional requirements.

B.4 Substitutions

Reference to a particular product by manufacturer, trade name, or catalog number establishes the products to be provided.

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.

B5 Structural Steel

Material for support of hardware or components on exposed structural bridge elements shall conform to the requirements of ASTM A36 structural carbon steel and be galvanized and painted with a two coat system from the Wisconsin department of Transportation Approved Product List. Bolts used shall be galvanized and painted and conform to the requirements of ASTM A325 Type 1 bolts and hardened steel washers shall be provided. The use of Stainless-steel support components shall include hardware that mitigates corrosion between dissimilar metals.

B.6 Cabinets

Provide enclosures or communications racks manufactured with 10-gauge steel for interior installation. Size cabinet to fit hardware in proposed location. Rack width shall be coordinated with the equipment to be installed inside the rack. Communication rack shall be provided with a front lockable door. Each cabinet shall be provided with a rack mounted surge protector device as manufactured by TRIP LITE Model DRS-1215 or approved equal.

B.7 CCTV Camera System

Design, provide and install a complete CCTV system including, but not limited to four color cameras, two thermal cameras, video recording controls, communication equipment cabinet, CCTV monitor cable, conduit, mounting hardware, software, and all necessary hardware to install a complete CCTV system as shown on contract drawings and as described herein.

Each color camera shall be an Axis P5655-E PTZ Network Camera. Provide wall and pole mount brackets to mount the cameras in such a way as to prevent theft. See drawings for approximate camera locations. Locations are to match the location of the existing cameras.

Each thermal camera shall be an Axis Q1942-E Thermal Network Camera. Provide pole mount bracket to mount the camera in such a way as to prevent theft. Thermal camera shall be pole mounted adjacent to the PTZ camera as indicated on the contract drawings.

Furnish and install control switches to automatically display the camera feeds on displays located locally at the Cherry St. bridge control room and at the Knapp St. bridge control room (remote site).

Furnish and install all necessary power supplies at each site.

Furnish and install all-in-one recording solution with a capacity to record a minimum of seven days of video. The recording solution shall be Axis Camera Station S2208 Appliance.

Refer to contract drawings for CCTV camera locations.

B.8 Switches

Furnish and install all switches as shown on contract drawings. Communication rack switch shall include Manageable Layer 2 Switch, 24 1G ports with high power PoE up to 90W, PoE power compatible with IEEE 802.3bt up to 90W per port and 4 x 1G/2.5G/10G uplink fiber ports. All other switches shall have the same characteristics with the required number of ports needed for a complete installation.

B.9 PA System

Design, provide, program, and install a complete intercom system for audio communications between the existing remote site and master control operator house. The existing intercom systems shall remain in place and be modified as necessary to work with the new system. Include all of the necessary equipment, amplifiers, field conduit, raceways, associated hardware and cable, plus any other equipment required for a complete, satisfactorily operation system. Provide all exterior devices enclosed in weatherproof nonmetallic enclosures. Supply equipment by a single manufacturer with at least five (5) years of experience in manufacturing this type of equipment.

The intercom system consists of eight outdoor speakers, six outdoor microphones, two indoor SIP Mic for paging multiple zones and all necessary switches, amplifiers, and network equipment.

The outdoor speakers shall be Axis C1310-E Network Horn Speaker or approved equal.

The outdoor microphones shall be Louroe Verifact E Microphone or approved equal. Provide network audio bridge for each microphone. Network audio bridge shall be as manufactured by AXIS, model C8110 or approved equal.

Furnish a Master control station with a SIP Microphone at both the Cherry St. control room and the Knapp St. control room. The stations shall be Axis 2N SIP Mic or approved equal.

Refer to contract drawings for speakers and microphone locations.

B.10 Fiber Optic Cables

Provide 1800 linear feet of fiber optic cable backbone with 72 single mode (OS2) strands and water blocking technology. Fibers shall be color coded. Fiber optic cable shall be as manufactured by CORNING, part number 072EWP-T4101D20 or approved equal. Refer to contract drawings for conductor path through existing manholes.

B.11 Fiber Optic Cable Patch Panel

Provide a modular fiber termination cabinet sized to accommodate the number of fibers required. The patch panel shall be as manufactured by CORNING, model EDGE8 or approved equal. Provide the required hardware for a complete fiber optic termination patch panel installation.

B.12 Firewall

Design, provide, and install a firewall system at each bridge. The firewall shall be a Next Generation Firewall with VLAN capable for segregation.

B.13 Monitor

Provide and install all necessary equipment for a display located at both the remote bridge site and master control site. The display shall be a LG Ultra HD TV Signage (UR640S9UD Series) 55" or approved equal. Provide a monitor ceiling mounted support as manufactured by STRONG, part number SM-CM-T-L or approved equal. Field coordinate the exact location of the monitor above the bridge control console.

B.14 Cat 6A Cable

Provide and install all necessary CAT 6A ethernet cable. Cable shall be rated for outdoor direct burial use. All outdoor installed CAT 6a ethernet cables shall be provided with an Ethernet Surge Protector as manufactured by AXIS model T8061 or approved equal.

B.15 Exterior Cabinets

Provide sized as required IP-66, NEMA-4X, polycarbonate cabinets to house CCTV or Communications hardware at locations where temperature and humidity area controls are non-existing. Cabinets shall be coordinated with the CCTV equipment supplier. Exterior cabinets shall be provided with locks, sunshield, and stainless-steel pole mounted supporting hardware.

B.17 Uninterruptible Power Supply

For each communication cabinet, furnish and install a 3000-KVA battery backup uninterruptable power supply as manufactured by Tripp Lite by EATON, model SMART3000RML2U.

B.18 Computer Lap-Top

Provide two computer lap-tops, one at the Cherry St. Control room CCTV/PA System rack and one at the existing Knapp St. control room Fiber Optic Cabinet. Each lap-top shall be configured to communicate video from the Network Video Recorder to the monitor displays as shown on contract drawings. At the Knapp St. existing fiber optic cabinet, provide an additional computer dock station with multiport output as manufactured by Plugable USB-C Quad HDMI Docking Station. Provide the required HDMI to BNC cable adapter to connect to the existing video matrix switch. Computer Lap-Top shall be as manufactured by Dell, Model XPS 17, with a 13th Gen Intel Core i7-13700H, NVIDIA GeForce RTX 4050 graphic card, 32GB of RAM memory, 1-TB SSD of Memory, loaded with all software and licenses as required.

B.19 Programmable Logic Controller (PLC)

Provide a PLC system based on section 66. PLC Controls – Cherry Street, Item SPV.0060.028 of this specification.

B.20 HMI Modifications

Provide labor and materials to modify the existing HMI graphics at the existing State St. Remote control enclosure. The HMI shall be re-configured to include information on Cherry St. Remote control operations.

Modifications should include graphic screens with color animation of major devices on screen to indicate status of signals, gates, barrier, rear locks and span. Signals will be received from the new PLC installed in the State St. Password-protect the setup screen. Screens shall be similar in nature to the existing screens used for the State St. Remote graphics display. Submit color copies of each screen for approval prior to testing.

C Construction

C.1 General.

All construction and installation shall be made by workers skilled in this type of work and under the supervision of an experienced and qualified electrical supervisor. In addition, the qualified firm shall provide supervisory assistance to the electrical contractor as specified herein. All work shall be executed in a neat and worker like 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 Installation or Placement

Follow all OSHA regulations concerning confined space entry and work. 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 according to the same number and designation shown on the approved wiring diagrams.

The contractor shall inspect existing manholes which cables will be installed and verify that existing rack space is allocated for new conductors. Based upon cable routing, the contractor shall provide the required manpower resources for pulling the conductors where manholes are located in vehicular traffic areas. Coordinate with the city any traffic closures or traffic deviation prior and during the fiber cable installation.

Coil each conductor inside manholes and then tape it to the conductors being used.

Conductors inside terminal boxes and at the control panels 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.

Unless requested in writing by the contractor with an objective reason for splicing, splicing of conductors will not be permitted.

C.3 Instruction Books.

C.3.1 General

Furnish 3 hard bound copies of loose-leaf booklets and electronic copies. The materials shall be bound into each booklet between rigid plastic or cloth binding covers. The instruction booklets shall be approximately 9 inches by 12 inches, and the diagram booklet large enough to contain the drawings without excessive folding so that they may be easily opened. The booklets 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 booklets, the method of binding, materials to be included, and the composite text shall all be reviewed and approved by the engineer.

- 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.
- A troubleshooting flow chart for troubleshooting the provided system shall be provided to facilitate the diagnosing and correcting of malfunctions.
- Names, addresses and telephone numbers of vendors and suppliers.
- Copies of all warranties on equipment supplied to the project.
- The complete spare parts list.
- All as-built schematics and wiring diagrams.

All as-built conduit layout and installation drawings.

C.3.4 Training

Provide and conduct training sessions consisting of the following:

Bridge operators shall be fully trained on operation of the CCTV and Communication system.

Bridge Maintenance Staff and Electricians shall be fully trained on troubleshooting and maintaining the CCTV and Communication system.

C.3.6 Spare Parts

Furnish the following spare parts:

- (1) One color camera
- (2) One thermal Camera
- (3) Two Microphones
- (4) Two speakers

Provide spare parts in sealed, uniform-sized cartons, with typed and clearly varnished labels to indicate their contents. Spare parts shall be delivered to the city or at a location designated by the city.

C.3.7 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.3.8 Guarantee

The contractor shall be responsible for the proper performance in part and as a whole of the equipment provided for a period of one year after the completion of the testing and training. 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 ensure the carrying out of the obligations.

C.3.9 Existing Equipment

The contractor shall carefully incorporate all new major CCTV, Communications and Controls equipment in existing cabinets and associated cabinets into the new work associated with the design and installation of the remote operation system. Where applicable, any equipment the contractor removes from the bridge shall be turned over the city at a location determined by the city.

C.4 PLC Programming

C.4.1. PLC Program Cherry Street bridge.

Develop the PLC application program for the Cherry St. bridge control and alarm logic in a manner that will provide reliable and safe operation of the bridge. All programming will be performed using ladder logic style programming method. Each address and rung of program will be well documented. The program will be organized to group the core bridge movement operations separate from any alarm or overhead type functions. Subroutines, and/or files, are to be utilized to separate and organize the program. Copies of the PLC ladder logic are to be sent to the engineer for approval.

Avoid the use of latching/unlatching relays. Every step is to be interlocked to prevent movement unless all conditions have been satisfied. Some of the circuits in the sequence are combined and interlocked with relay controls for added safeguards. All sequences can be stopped at any time and the sequence can be continued in either direction from the point the sequence was stopped, provided that all interlocks are satisfied.

Program alarms with a de-bounce circuit or delay to prevent nuisance trips. Group alarms in a separate file or subroutine for improved organization. PLC alarms shall be displayed at the HMI in the Main Control Console. Alarms displayed shall be coordinated with the design bridge control drawings. Protect the HMI alarm setup screen via password, so only authorized personnel will have access to changing the values.

Submit hard copies and electronic files for review and approval. Provide user's manual(s) and instruction manual(s) and hardware, including cables and connectors.

C.4.2. PLC Program Knapp St. Bridge (Bridge B-40-62)).

Develop the PLC application program for bridge control and alarm logic in a manner that will provide reliable and safe operation of the remote bridge. The PLC program at the remote State St. bridge control console at the Knapp St. Ave. Bridge control room will communicate with the PLC on the Cherry St. Bridge, provide the signals from the remote State St. operators console at Knapp St. Ave. operators console to the Cherry St. PLC and receive the status of the devices on the Cherry St. Bridge for display on the State St. bridge remote control console HMI. Use good programming practices to verify that the

communications between the PLC's is uninterrupted and immediately halt all motions on the W. Cherry St Bridge and notify the operator if communications fail.

D Measurement

The department will measure PLC and Communication Modifications – Knapp St. (Bridge B-40-62) as each unit acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.029	PLC and Communication Modifications – Knapp Street (Bridge B-40-62)	EACH

Payment is full compensation for programming the bridge programmable logic controller (PLC) and operator interface (HMI), new communication systems, and PA and CCTV systems.

65. Lightning and Surge Suppression, Item SPV.0060.030.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the installation and operation of a fully functional lightning protection and transient voltage surge-suppression (TVSS) system.

Comply with all local codes, all laws applying to electrical installations in effect and with the regulations of the latest NEC, where such regulations do not conflict with the laws in effect and with the requirements of the utility company.

It is the intention of the contract plans to call for completely finished work, fully tested and ready for operation. Furnish, deliver, and install any apparatus, appliance, materials, or work not shown on the plans but mentioned in the special provisions or vice versa, or any incidental accessories necessary to make the work complete in all respects and ready for operation, shall be furnished, delivered, and installed without additional expense to the city.

A.1 Scope

The work under this item includes the following:

- Lightning Protection System
- New incoming Service Transient Voltage Surge Suppression.
- Transient Voltage Surge Suppression for all motors

Transient Voltage Surge Suppression for all field devices located in machinery rooms on the bascule leaves and open areas of the pier levels.

A.2 Related Provisions

Unless otherwise noted, work under this special provision shall conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry Street
- PLC Controls – Cherry Street
- PLC and Communication Modifications – Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable

A.3 Submittals

Submit the following for each component of the Lightning Protection and TVSS bid item:

- Submit Manufacturers shop drawings.
- Submit Product Data.
- Submit Manufacturer's installation instructions.

Submit operation and maintenance data.

A.4 Regulatory Requirements

- National Fire Protection Association, NFPA-780, Standard for the Installation of Lightning Protection Systems, 2008.
- ANSI/IEEE Standard 81 Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
- UL 96A Installation Requirements for Lightning Protection Systems.
- NFPA 70 - National Electric Code, NEC, Article 250, 1999.
- UL 467 - Grounding and Bonding Equipment.

B Materials

B.1 Lightning Protection

In general, use 316 stainless steel materials. In locations where system components are to be connected to aluminum surfaces, use tin plated or CU-AL marked fittings. Use Class I stainless steel air terminals with a threaded base. Height shall be no less than 18 inches for control house. Provide threaded stud base for air terminal and bolted clamp conductors. Provide main and down conductors of stranded stainless steel, 14 AWG minimum size strands, 133 CM overall. Provide bonding conductor of stranded stainless steel, 17 AWG minimum size strands, 28,000 CM overall. Bond connections between movable span and fixed pier, and traffic and barrier gate arms to the operator base bonded with No. 4 type W or extra flexible welding cable.

Use a grounding electrode of minimum of 1-inch by 10-inch feed copper clad steel for all ground points including submarine earth grounding electrodes. In general, connect bonds and taps by exothermic weld. Mechanical, bolted connections are allowed at the air terminals, the flexible cable ends, sheet piles and on aluminum surfaces. Provide bonding plates for aluminum surfaces of tin plated or copper-aluminum alloy.

Design the static discharge assembly to safely interface with other bridge components without degrading, in any way, its structural integrity and while blending with the appearance of the structure. Design the system to withstand a wind force of at least 80 MPH.

Install a minimum of two (2) air terminals on the peak of the control house roof. Bond the terminals to a main conductor installed around the perimeter of the roof. Install two (2) down conductors, each from opposite comers and extending down to submarine ground rods. Encircle a bonding conductor around the control house windows, with the window frame bonded at the comers. Route main conductors between ground rods as shown on the plans. Bond the ground system to the lightning protection system with conductors sized per NFPA 780. Bond all metal structures, including traffic light structures, traffic and barrier gate assemblies, and camera poles and any external lighting fixture, metal traffic barrier and all handrails to the lightning protection main conductors. Bond the handrail and guardrail to the main conductors at regular intervals. Bond the electrical system ground to the lightning protection system at the Motor Control Center ground bus. Exothermically weld all joints in the system. Use bolted connections where connections are accessible for inspection and maintenance.

B.2 Surge Suppression

B.2.1 General

Furnish and install surge suppression equipment as described in this article and shown on the plans. Provide Transient Voltage Surge Suppressors (TVSS) as described herein for all motors, incoming power and any circuit that enter or leave the operator house's protected perimeter. The protected perimeter includes the operator level, entry-level room and electrical room on the lower level room. Install motor and branch circuit protectors in the PLC and Motor Control Center cabinets.

B.2.2 Conformance

Conform all materials and workmanship to the latest editions of the following standards and publications referenced in various parts of this article:

- ANSI/IEEE C62.1 Standard for Surge Arrestors for AC Power Circuits
- Underwriters Laboratories, UL 1449 Standard for Safety, Transient Voltage Surge Suppressors, Revised edition.

UL 96A Installation Requirements For Lightning Protection Systems.

B.2.3 Suppressors for Motor Branch Circuits:

Install transient voltage surge suppressors on each motor branch circuit entering or leaving the operator house's protected perimeter. Provide motor circuit suppressors rated for category A in a parallel shunt design, clamping each conductor to ground.

Motor circuit suppressors shall meet or exceed the following minimum criteria:

- Single impulse withstand rating: 25,000 A (8 x 20 μ s waveform) plus power-follow per wire.
- Pulse lifetime rating (3,000 A – 8 x 20 μ s plus power-follow): 1,000 occurrences.
- Minimum energy handling capability – 1,500 joules
- Worst case response time: 5 μ s
- Maximum clamping voltage (voltage with input current of 3,000 A – 8 x 20 μ s plus power-follow):

Normal Applied Circuit Voltage	Maximum Clamp
120V	300V
240V	550V
277V	1,000V
480V	2,000V

- (Energy rating @10 x 1000 μ s waveform plus power-follow.)
- UL listed and approved for the location in which they are installed.

Provide visible indication of suppressor failure. Arrange shunt TVSS elements to fail open.

B.2.4 Suppressors for Control and Signal Circuit Protection

Provide control circuit suppressors that are multi-stage hybrid shunt-series-shunt design. Suppressors for balanced (two-conductor) circuits shall also clamp conductor to conductor when required by the nature of the circuit. Provide suppression devices for control circuit protection in single or multi-channel packages suitable for the circuitry to be protected with connectors or terminal blocks or strips suitable for the type of wiring being used.

Provide suppression for each conductor consisting of a high energy dissipater parallel (shunt to ground) first stage, a series surge current-limiting impedance second stage, and a voltage clamping parallel connected third stage. Resistive limiting elements may be used where the voltage drop across the series resistance has no effect on circuit operation. Inductive series

elements may be used on other circuits to effectively pass DC or low frequency AC currents while limiting passage of fast risetime surge waveforms.

Minimum performance criteria (each circuit) shall be as follows:

- Maximum single impulse conductor-to-ground current withstand: 10,000 A (8 x 20 μ s waveform) plus power-follow.
- Pulse lifetime rating category B worst-case current waveform (8 x 20 μ s at 3,000 A plus power-follow): 1,000 occurrences
- Minimum energy handling capability - 500 joules per conductor
- Worst case response time: 5 μ s

Worst case (3,000 A at 8 x 20 μ s) clamping voltage: 200 percent of normal operating voltage amplitude and polarized or bipolar as appropriate for each circuit type.

- Initial clamping voltage: 150 percent of normal operating voltage peak amplitude \pm 5 percent.
- Capacitance for DC or low frequency AC circuits: Do not exceed 2,000 picofarads, measured line to ground at the rated diode breakdown voltage.
- Capacitance for audio, video, high frequency, or high baud rate circuits:
- Install suppressors designed for use on such lines. Capacitance of such units shall be equated to equivalent cable length based on the type of cabling used for the particular circuit. The sum of equivalent cable length of suppressors and actual cable length shall not exceed manufacturer's recommended maximum values for the system on which those devices are installed.

B.2. Incoming Main for Control and Signal Circuit Protection

Provide an incoming main surge protective device that meets the following minimum criteria:

- Installed in a NEMA 12 enclosure.
- L-L, L-N, L-G and N-G protection modes.
- 10 year warranty.
- U.L. 1449 listed.
- Peak surge current rating per phase of 480 kA.
- Indicator LEDs for normal and fault conditions for each phase.
- Audible alarm with enable/disable switch.
- Surge Counter.

C Construction

C.1 General

Protect the operator house by a lightning protection system installed according to U.L. 96A except as expressly otherwise specified herein. Furnish and install system by a U.L. listed installer of lightning protection systems and provide a Master Label or UL Letter of Finding for the system.

Protect the operator house fully according to UL 96A as though it were a separate structure. Pay special attention to routing the down leads from the lightning system as to maintain a minimum 6-foot spacing from the control desk and interior equipment bonding down leads.

Protect the moving bascule leaves and their supporting piers according to UL 96A Class II. Treat the bascule leaves as structural steel framing under UL 96A Section 13 assuming that the perimeter grounding requirements apply when the bascule leaf is in the upright position. The down conductors from the bascule leaf to the balance of the structure will be No. 2/0 AWG type W extra flexible cable such as welding cable or locomotive/diesel cable, all other main and secondary cables shall be standard Class II conductors. Provide the connection between the flexing cable from the bascule leaf and the main down conductor on the pier to route surges through the flexing cable. Bond all machinery, fixed equipment, and metal parts within the bounds established by the back faces of the bascule leaf piers, and excluding the fender system, according to UL 96A. Treat metal handrails above road level air terminals and bond with main conductors except the "two-way" path requirement of UL 96A Paragraph 7.1 will not apply. There shall be no requirement to bond to any embedded reinforcement bar. Where structural steel members of the bridge are to be connected, piercing of the steel member is not allowed.

Protect isolated electrical equipment (e.g., traffic gates) or support poles or structures for electrical apparatus (e.g., signal lights) according to standard UL 96A practice utilizing individual ground terminals. Bond traffic and barrier gates with No. 2/0 AWG copper. Bond the gate arm to the gate operator housing with (No. 1 AWG) extra flexible tinned copper bonding strap 25 mm wide by 10 mm thick.

The unique nature of the bridge must be taken into account in the selection of materials and techniques. The highly corrosive environment requires that externally mounted conductors, air connectors, and ground connectors shall be corrosion resistant either inherently (e.g., series 300 stainless steel or bronze construction) or by protection using plating or coating acceptable to the UL and the engineer. All conductors and ground terminal components within five feet above mean high water shall be inherently corrosion resistant sufficient to provide a minimum thirty-year service life.

Access to the system will be restricted after the installation is completed and routine maintenance will be minimal. Install the system in a manner to assure long term reliability. Weld connections to the bascule leaf structure and other fixed metal parts, cable splices, and connections to ground terminal components. Restrict bolted connections to removable items (e.g., motors) and to the flexing cables from the bascule leafs to permit cable replacement. Crimp type connectors will not be acceptable in any part of the lightning protection system. Conductor guards shall be non-metallic.

Conductor or ground terminal exposure to the water only (e.g., "reservoir grounding") will not be an acceptable ground connection. Accomplish grounding in the submarine earth according to UL 96A Paragraph 8.6 or 8.8 as applicable except that ground rod is used. Ground terminal components must be buried and anchored in a manner to provide the required service life. Furnish a diver and the necessary diving equipment for use of the UL Inspector, the engineer, or his representative in making inspections of the grounding installation. Upon completion of the installation, furnish the Master Label issued by Underwriters Laboratory for this system, thus certifying that this system complies with all UL requirements.

The desired primary bond to the TVSS system is to be at the TVSS equipment cabinets on the equipment (lower) floor.

C.2 Surge Suppressors

C.2.1 Bonding and Grounding Conductors and Materials

Use conductors for individual surge suppressor bonding specified in UL 96A for the lightning protection circuit unless otherwise specified. Make connections as specified in UL 96A unless otherwise specified. Aluminum conductors are not acceptable.

C.2.2 Segregation of Wiring

Classify all system wiring into protected and non-protected categories. Wiring on the exposed side of suppression devices is considered unprotected. Surge suppressor grounding and bonding conductors also fall into this category. All wiring between surge suppressors and protected equipment is considered protected. Wiring that is wholly within a protected cluster and thereby exempted from surge suppression requirements is also considered protected.

Provide a minimum of three (3) inches of separation between parallel runs of protected and unprotected wiring in control panels, terminal cabinets, terminal boards, and other locations. Do not bundle protected and unprotected wiring together or route through the same wireway. Where bundles of protected and unprotected wiring cross, cross them at right angles with a minimum of one (1) inch of separation or a ferrous shield between the conductors. No unprotected wiring is permitted with the protected perimeter of the operator house or any other system that is protected as a cluster.

C.2.3 Installation of Suppressors

Mount, install, and ground all suppressors per the manufacturer's requirements. Give special attention to grounding requirements and minimum conductor sizes. Install individual suppressors as close as possible to the equipment to be protected consistent with available space. Where space permits and no code restrictions apply, install suppressors within the same cabinet as the protected equipment. Install bonding jumpers not exceeding two (2) inches in length between the chassis and suppressor ground terminals. Use bolted connections with star washers to ensure electrical and mechanical integrity of connections to the equipment chassis. Install suppressors in a neat, logical manner. Lead dress shall be consistent with recommended industry practices for the system on which these devices are installed.

Keep bonding between ground terminals for power and control or signal line suppressors serving a particular item or cluster of equipment as short as possible. Where practical, install suppressors in a common location for the cluster with the ground terminals bonded closely together. For installations requiring separation between the various suppressor grounds and equipment chassis within an equipment cluster, use the following table to determine bonding conductor requirements (distances are measured between most distant suppressor or chassis grounds within the cluster):

Bonding Distance	Material
0-10 feet	No. 6 AWG bare copper (solid) or 1½-inch copper strip 0.051 inch thick (min.)
10-50 feet	57,400 CM main conductor or 3-inch copper strip 0.051 inch thick (min.)
Over 50 feet	115,000 CM main conductor or 6-inch copper strip 0.051 inch thick (min.)

For the operator house cluster, mount all suppressors except power service protectors in a cabinet assembly at the protection window in the protection perimeter. Where cabinets are used to house surge suppressors, use painted steel backboards to serve as a low impedance ground plane for bonding surge suppressor leads together. Bond suppressors with ground terminals not inherently bonded to the ground plane through their mounting to this plane using a conductor from the table above. Drill and tap ground planes and backboards to accept brass or series 300 stainless steel machine screws or bolts. Remove any paint in the area of the bond and use star washers to attach.

Where multi-channel surge suppressor devices are used, provide a minimum of 20 percent of the channels as spares. For example, if four channel modules are installed, one channel will be the spare. If eight (8) channel modules are installed, two channels will be spares.

C.2.4 Transient Voltage Surge Suppression System Performance Criteria

Transient voltage surge suppression including grounding and bonding as required by this specification shall effectively protect the electrical systems to which it is applied against lightning and other surge transients throughout the useful life of the system. Design surge suppression devices and install in such a manner that normal operation of the system is not impaired due to the installation of such devices.

Calculations for suppressor pulse lifetime rating must assume the devices are installed in areas of medium exposure when such devices are installed in ANSI/IEEE 62.41 category A or B locations. Devices in category C locations shall be considered to be in an area of high exposure. Frequency of surge occurrence and surge amplitudes shall be as outlined in this standard with a required minimum suppressor lifetime of 15 years. Surge current amplitudes and energy dissipation values used for life test and calculation purposes must include the power-follow currents appropriate to the circuit in which they are installed.

Protect the electrical system by dealing with each group of related devices as a "cluster" of equipment and protecting all metallic circuits that enter and leave the cluster. The cluster may be as large as the operator house or as small as an individual equipment cabinet. For purposes of establishing maximum size, all equipment within a protected cluster falls within a circular area of not greater than 25 feet in radius around a common point. Group all metallic circuits entering and leaving the equipment cluster together at a common point or "window" not larger than 4 by 8 feet in dimension and protected with one exception: treat the operator house as a single continuous cluster with a window not larger than 8 by 8 feet and equipment which is located more than 25 feet from the window and circuits which extend beyond the 25 feet radius to serve devices within the building shall not require protection provided the following conditions are met:

- Circuitry is enclosed within metal raceways. Newly installed raceway must be metallic with the following exceptions:
- Lightning and surge suppression bonding conductors shall be bare or in non-metallic tubing only.
- The circuit between the main service protector and the control panel shall be in non-metallic conduit to provide a minimum impedance path for any transients that may reach the power bus from field circuits.
- No wiring within the raceways containing such circuits extends beyond the confines of the building or cluster.
- No connection is made between this wiring and conduit ground outside of the house's protected perimeter.

- All devices connecting to such circuits shall have no connections to conduit or other grounds or other power sources outside the house's protected perimeter.
- All equipment chassis within the house's protected perimeter shall be effectively isolated from stray grounds and bonded to a ground bar at the protection window for the house.

Connect the ground terminals of the suppressors at the window and any remotely located suppressors within the house (e.g., marine radio antenna, main service entrance protector) to this bar using a short, direct route. The bonding conductor between the control desk, motor control center, all suppressors, and the ground bar must be minimum UL 96A Class II main conductors installed according to the requirements stated above for the lightning protection system. Coordinate the routing of these conductors with the installation of the lightning protection system so as to attempt to maintain minimum 6 feet spacing from the lightning down leads and prevent the necessity of cross-bonding before the ground bar. Route the bonding conductor from the control desk to the Motor Control Center and thence to the ground bar. Route all other bonding conductors direct to the ground bar without interconnection except at the ground bar. Nothing herein shall necessitate isolating raceway grounding. Around all raceways at each cabinet entered; field conduit entering the protection window from outside the house perimeter must be bonded to the ground bar according to the lightning protection requirements. The operator house ground bar shall be two-way bonded as specified in UL 96A Paragraph 7.1 (for air terminals) to the two main down conductors of the lightning protection system. The bonding conductors must be at least equal in size to the down conductors. Bonding connections between the ground bar and down conductors shall be thermo-welded; bolted connections are not acceptable in this circuit.

External to the operator house, isolate equipment chassis within a protected cluster from stray grounds and bond them to a ground bar at the suppressor location for the cluster. Connect the ground terminals of the TVSS protecting the equipment cluster to this bar using a short, direct route. The ground bar for each equipment cluster must interconnect with the electrical "green wire" grounds serving equipment within the cluster.

D Measurement

The department will measure Lightning and Surge Suppression as each unit for the Lightning and Surge Protection system construction and installation, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.030	Lightning and Surge Suppression	EACH

Payment is full compensation for furnishing and installing the lightning and surge protection equipment for the bascule span.

66. Traffic Gates and Signals, Item SPV.0060.031.

A Description

This special provision describes furnishing labor, tools, equipment, and materials necessary for furnishing and installing traffic gate assemblies and traffic signals, including the anchor bolts.

A.1 Submittals

Submit the following for each component of the Traffic Gate Assembly bid item:

- Submit manufacturer's shop drawings.
- Submit product data.
- Submit manufacturer's installation instructions.

Submit operation and maintenance data.

A.2 Related Provisions

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC Controls - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable

B Materials

Furnish vertical to horizontal type, electrically operated with manual cranking ability gate assemblies at locations shown in the plans. Equip on-coming gate assembly enclosures with warning gongs, according to manufacturer's instructions. Equip gate arms with steel hot-dip galvanized, sectional bolt-on counterweights with at least 10 percent adjustment and LED warning lights.

B.1 Traffic Gate Assemblies

House the operating mechanism and main control components in a weatherproof housing constructed of 0.188-inch (4.8-mm) carbon steel, hot dip galvanized after fabrication. Exterior surfaces shall be painted aluminum. All fasteners shall be corrosion resistant. Design the housing for easy removal of the arm shaft assembly as a unit, including bearings and main arm crank. Fully gasket and seal the arm assembly mounting and shaft openings.

Use full cross bronze straps for mounting front and rear access doors with slip-off type hinges and stainless steel pins. Furnish two door handles per door, with a vise action to compress a neoprene bulb-type gasket to seal the door openings.

Size anchorages for new gate installations on gate pilasters per manufacturer's recommendations with drilled anchor bolts, set with epoxy adequately sized to support all attachments.

During the opening and closing cycles, begin the gate arm movement with zero velocity and accelerate smoothly, reaching maximum velocity at mid stroke (45 degrees) then decelerate smoothly to zero velocity at full stroke (90 degrees) without whip or bounce. Standard operating time is 13 seconds for full opening or closing cycle. Size gate assemblies and anchorages to handle the weight of the arm used and to operate against a wind speed of 75 MPH.

Design the main arm shaft with a minimum of 2-inch diameter AISI 4150 with a minimum tensile strength of 140,000 psi. Mount the shaft in heavy duty re-lubricable ball bearings. The warning arm shall pivot in the vertical plane via a mechanical 4-bar linkage utilizing cranks keyed to the main arm shaft and transmission shaft and an adjustable connecting rod between a pair of self-aligning spherical rod ends. The connecting rod shall be of 1-inch (25mm) diameter AISI 4150. The linkage shall be driven by a fully enclosed, double reduction, worm gear speed reducer. Gear ratio used shall produce an operation time of 11 seconds.

Equip gate with a manual motor disconnect switch and with an automatic disconnect switch to break control circuit when any door is opened. Ensure the light circuit is equipped with a heavy-duty, solid state, fully factory-wired, with two alternately flashing circuits and one steady bum circuit with a flash rate of 0.50 second ON, 0.50 second OFF. Provide all mounting hardware, solid state flashing circuitry, a clearly labeled terminal block, a heat sink, and a transformer when required.

Furnish and install limit switch unit assemblies consisting of eight individual switches with one set of normally open and one set of normally closed contacts each. Furnish and install contacts with a UL rating of not less than 15 A at 480 VAC. Use corrosion resistant non-ferrous materials for limit switch body, shafts and cams.

B.1.1 Gongs

Provide a warning gong mounted on top of the on-coming warning gate housing. Each warning gong must be weatherproof, motor-operated, vandal-proof, 12-inch gong mounted in a heavy-duty, cast-aluminum housing with hinged back door. The gong must be of cast-bronze. Each gong shall be approved equal to the G-12 Warning Gong as made by Roadway Manufacturing, the B&B Electromatic Z-555BR Warning Gong, the Western-Cullen No. 555, or the Security Products Division of Federal Signal Corporation Type 555. Paint and mount gongs with hardware in such a way as to prevent theft.

B.1.2 Gate Arms

Use 4-inch (102-mm) square, 6005-T5 aluminum extruded tubing for gate arm with 3-inch high strength UV-resistant fiberglass extension. Stainless steel truss cables and a damping type bumper rod shall be furnished with longer arms at the discretion of the manufacturer. Cover the front and rear arm surfaces with alternating red and white high intensity reflective sheeting.

Verify gate arm length and coordinate with final roadway design. Ensure that the gate arm is covered on both sides with alternating 16-inch reflective red and white engineering grade sheeting. Provide a break-away shear pin base for each gate arm so that when excessive force is applied to arm, the pin shears, the arm shall then swing 45 degrees horizontally and drop free of the gate operator thus minimizing damage to operator. Design shear pin base and lightweight arm assembly for easy, rapid reinstallation or replacement by one person.

Furnish and install weatherproof LED warning lights on all gates, to operate on 120 VAC. Provide high-intensity white xenon strobe lights on gate arms as shown on the plans. Strobes should be weatherproof and operate on 12 VDC.

B.1.3 Motors

Furnish and install totally enclosed, Class F insulation motors specifically designed for gate actuator capable of operating at full load when the voltage to the motor is ± 10 percent of rated voltage. Use only motors having the voltage capacity as shown in the plans. Ensure the motor has the capacity to perform all necessary functions to the satisfaction of the engineer based on torque required for gate arm and accessories. Ensure the braking mechanism is equipped with a solenoid release, automatic motor brake that automatically releases when hand crank is inserted. Provide a hand crank to manually raise or lower gate arm in event of power failure. Door safety switches shall automatically disconnect the control circuit power and will positively prevent electrical operations of the gate arm when the door is open.

B.2 Traffic Signals

Furnish and install new alternating red traffic signals on an aluminum signal pole with a pedestal base and a "STOP HERE ON RED" sign. Signals and poles shall conform to sections 657 and 658 of the Standard Specifications. Traffic signal heads shall be 12-inch red LED type.

C Construction

Verify system voltage matches gate requirements, Install according to manufacturer's instructions. Make all electrical connections to provide proper operation of the traffic gates, lights, gongs, etc. Make connections to control system, manually test hand crank, and power test traffic gates to ensure proper operation of gate operator, gate arm lights and gate interlock.

Install pressure type terminal blocks inside the housing on the roadway side and terminate all control wires on terminal blocks and clearly label all circuits. Use No. 16 AWG stranded or larger wire. Ensure that the color code or number conductors match wiring diagram.

Ensure that gear limit switches to the drive mechanism are in step with the actual gate position at all times, whether operation is by power or manual mode. Do not use cams or screws to set the limit switches. Do not use designs requiring battery backup methods to ensure position control in the event of power failure.

C.1 Testing

Visually observe the operation of gates. Adjust the balance weights of the gate arm to provide a smooth operation with little to no bounce. Adjust limits, cables and arm rods so gate arm is level when in the down position.

D Measurement

The department will measure Traffic Gates and Signals 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.0060.031	Traffic Gates and Signals	EACH

Payment is full compensation for providing, installing, testing and making fully operational all traffic gates and traffic signals.

67. Power Distribution and Motor Control Center, Item SPV.0060.032.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, testing, and making fully operational new incoming electrical service, power distribution equipment, panelboards, transformers and a motor control cabinet.

A.1 Scope

The work under this item includes the following:

- Main Disconnects
- Automatic Transfer Switch
- Lighting Panelboards
- Power Distribution Panelboard
- Lighting Transformer
- Motor Control Cabinet
- New Electrical Services

A.2 Related Provisions

Unless otherwise noted, work under this special provision conforms to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console – Cherry St.
- PLC Controls - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable
- Architectural Exterior Bridge LED Lighting
- Illuminated Bridge Signs

B Materials

B.1 Motor Control Cabinet

B.1.1 Cabinet

Provide heavy duty NEMA type 12 enclosure manufactured with 10-gauge steel with flange or through the door disconnect. Apply a baked powder coat gray finish on the outside and white finish on the inside to the enclosure.

Provide laminated nameplates on each door. Identification nameplates will have black characters on a white background. Attach nameplates with stainless steel screws. Each nameplate will identify each starter unit, circuit breaker or other control unit and include the horsepower or current rating of the device.

Provide high voltage safety warning name plates with white characters on red background. Also provide power disconnect locations for Motor Control Center compartments not equipped with a power disconnect.

B.1.2 Starters

Provide all starters with a minimum NEMA size 1 starter. Each starter will have its own control power transformer. Each starter will have a minimum of 1 N.O. and 1 N.C. contacts. Provide each starter with door mounted 120-volt LED "ON" indicator lights. Provide overload relays with Class 20 trip. Overload relays are to be re-settable from outside the enclosure by means of an insulated bar or button. Starters are to be protected by motor circuit protectors.

Provide 3-pole 480 VAC, full voltage, NEMA type starters of the magnetic combination type. Motor starters will be a combination circuit breaker, NEMA controller with overload relay protection.

Furnish, where indicated or required, motor controls having the electrical characteristics, ratings, and modifications shown in the plans. All magnetic starter coils shall be 120 VAC.

- NEMA JCS 1 - Industrial Control and Systems- General Standards
- NEMA ICS 2 - Industrial Control and Systems- Controllers, Contractors and Overload Relays Rated not More than 200 VAC or 750 VDC
- NEMA JCS 4 - Industrial Control and Systems- Terminal Blocks
- NEMA ICS 5 - Industrial Control and Systems- Control Circuit and Pilot Devices
- NEMA ICS 6 - Industrial Control and Systems- Enclosures
- NEMA ST 1- Standard for Specialty Transformers (Except General Purpose Type)

B.1.2.1 Non-Reversing Starters (Across-the-line magnetic starters for motors up to 100 HP, 600 VAC):

Provide starters that are built and tested according to the latest NEMA standards. Non-reversing starters shall be equipped with three NEMA Class 20 overload relays.

Provide for field installation of up to 3 N.O. and 4 N.C. NEMA res 2, Class A300, auxiliary contacts in addition to the hold-in interlock.

B.1.2.2 Reversing Starters (Reversing magnetic starters for motors up to 100 HP, 600 VAC)

Provide starters that are built and tested according to the latest NEMA standards. Reversing starters shall be equipped with three NEMA Class 20 overload relays. Provide

for field installation of up to 4 N.O. and 4 N.C. NEMA res 2, Class A300, auxiliary contacts in addition to the normal interlocks.

B.1.2.3 Overload Relays

Overload relays shall be block-type with a push-to-test feature. An isolated, field- mountable alarm contact shall be available.

B.2 Main Disconnects

Furnish main disconnects with a molded case circuit breaker with an adjustable electronic trip unit and rated for service entrance and minimum interrupting rating of 10,000 KA. The disconnect enclosure shall be NEMA 4X stainless steel. Operating handle will always remain connected to circuit breaker. The operating handle is not to be mounted in the door of the enclosure, but to the side of the door for safe "stand-aside" operation.

B.3 Lighting Transformer

Provide transformers with proven 220 °C, UL tested insulation system. Wind coils with copper. Insulate material with proven, high temperature resistant 220 °C material. Ensure all materials in the transformer are flame retardant and do not support combustion as defined in ASTM Standard Test Method D635. Provide final insulation treatment by total immersion in a 220 °C insulating varnish that maintains superior bond strength, high dielectric strength, and outstanding power factors at temperatures normally associated with 220 °C system.

After immersion, cure the varnish thoroughly at normal operating temperatures to assure the scouring of all volatiles in the varnish solvent.

Construct transformers with core materials of high quality and low loss characteristics to minimize exciting currents, no-load loss, and interlaminar vibrations. Incorporate built-in vibration dampening systems to minimize and isolate sound transmission. Mechanically brace the core-coil assembly to withstand short circuit tests as defined in NEMA TR-27. Coil construction and mechanical bracing members must prevent mechanical degradation of the insulation structure during short circuit.

Provide self-bracing transformer enclosure and provide drip-proof and rodent-proof protection. Include convenient knockouts for conduit entrance. Locate terminal compartment in bottom of transformer, below the core-coil assembly, for side or bottom conduit entrance. Temperature rise in terminal compartment must not exceed 5 °C above ambient. Run line and load conductors in separate conduits.

Provide transformers with two 22 percent full capacity taps above rated voltage and two 22 percent full capacity taps below rated voltage. Minimum basic impulse level (BIL) allowed is 10 kV. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap. Provide transformers 75 kVA and less, suitable for wall, floor, or trapeze mounting; transformers larger than 75 kVA shall be suitable for floor or trapeze mounting. Provide continuous winding coils with terminations brazed or welded. Include transformer connection data and overload capacity based on rated allowable temperature rise on the factory nameplate.

Conduct the following tests at the factory:

- Applied voltage test (one minute) 4 kV.
- Induced voltage test - two times normal for 7,200 cycles.

Ratio and phase relation.

Test reports on electrically duplicated units must certify that the following tests have been completed on the first rating of any design:

- No load losses.
- Induced voltage.
- Total losses.
- Sound level.
- Applied voltage.
- Impulse test.
- Temperature rise.

Submit three (3) copies of test results to the engineer for approval.

B.4 Panelboards

Furnish and install, where indicated, a dead-front panelboard incorporating switching and protective devices of the number, rating, and type noted herein or shown on the Plans. Panelboards shall be circuit breaker equipped. Panelboards shall have general purpose enclosures and shall be surface mounted except where noted. All panelboards shall be rated for the intended voltage and shall be according to the Underwriters' Laboratories, Inc. "Standard for Panelboards" and "Standard for Cabinets and Boxes" and shall be so labeled where procedures exist. Where panelboards are to be used as service entrance equipment, they shall be so labeled. Panelboards shall also comply with NEMA Standard for Panelboards, National Electric Code, and Federal Specification 115a (Power Distribution Panels) where applicable. Manufacturer shall be a company specializing in manufacturing the product specified with a minimum of five years' documented experience.

Factory-assemble interiors with switching and protective devices, wire connectors, etc. All terminals shall be suitable for copper wire of the sizes indicated. Interiors shall be so designed that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be so designed that circuits may be changed without machining, drilling, or tapping. Arrange branch circuits using double row construction. Provide a factory nameplate listing panel type and ratings. Bus bars for the mains shall be copper and sized according to UL standards. Unless otherwise noted, full size neutral bars shall be included. Bus bar taps for panels with single pole branches shall be an-anged for sequence phasing of the branch circuit devices. The short circuit rating of the assembled panelboard shall be according to UL standards and their test verification. Phase bussing shall be full height without reduction. Cross and center connectors shall be copper. Neutral bussing shall have a

suitable lug for each outgoing feeder requiring a neutral connection. Spaces for future switching and protective devices shall be bussed for the maximum device that can be fitted into them.

Provide boxes made from galvanized code gauge steel of sufficient size to provide a minimum gutter space of six inches on all sides. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, size the box to include this wiring space. This wiring space shall be in addition to the minimum gutter space specified above and the limiting width may be increased accordingly. Provide a minimum of four interior mounting studs.

Include hinged doors covering all switching device handles in all panel trims, except that panelboards having individual metal clad externally operable dead front units may be supplied without such doors. In making switching device handles accessible, doors shall not uncover any live parts. Provide doors with a cylinder lock and catch. Key all locks alike. Furnish a directory frame and card having a transparent cover on each door. Fabricate the trim from code gauge sheet steel. Clean and finish all exterior and interior steel surfaces of the panelboard trim with gray ANSI-61 paint over a rust-inhibiting phosphatized coating. For flush panels overlap trim for the box by at least $\frac{3}{4}$ inch all around.

Protect electrical circuits with molded case circuit breakers with inverse time delay and instantaneous circuit protection. Operate the breakers with a toggle type handle with a quick-make, quick-break, over-center switching mechanism that is mechanically trip free from the handle. Include provisions so that the contacts cannot be held closed against short circuits and abnormal currents. Tripping because of overload or short circuit shall be shown by the handle automatically assuming a position midway between the manual ON and OFF positions. Ground and polish all latch surfaces. Plug-in type circuit breakers are not acceptable. Breakers must be completely enclosed in a molded case, bolt-on type construction. For non-interchangeable trip breakers seal their covers; for interchangeable trip breakers seal the trip unit sealed to prevent tampering. Provide non-welding silver alloy contacts with Arc chutes, consisting of metal grids mounted in an insulating support.

Circuit breakers shall conform to the applicable requirements of NEMA Standards, and meet the appropriate classifications of Federal Specifications W-C-375b. Provide molded case breakers of the following types: Thermal magnetic standard type that provides inverse time delay overload and instantaneous short circuit protection by a thermal-magnetic element; or magnetic only standard (Motor Circuit Protector) that provides instantaneous short circuit protection by a front adjustable magnetic element with supplemental thermal overload protection. The adjustment button(s) shall have main setting points and mid-setting points following a linear scale so that each point has a significant value within calibration tolerance.

Provide multi-pole breakers with a single operating handle that is independently removable without disturbing adjacent units or other bus connections and is fastened to the main bus bars with a bolted connection. Plate all copper parts to prevent corrosion. Provide 100 A frame breakers with an interrupting rating of 10,000 A (minimum). Provide larger frame size breakers with an interrupting rating of 22,000 A (minimum).

B.5 Automatic Transfer Switch

Provide an automatic transfer switch rated for 400 amps at 480 volts in a in a NEMA 4X steel cabinet. Each molded case switch shall be mechanically interlocked to prevent parallel power sources. A permanently affixed operating handle shall be affixed to the cabinet to allow transfer of power without entering the cabinet. Indicator lights shall be installed on the door and connected to the line side of each source of power and the load side of the switch.

B.5.1 General

B.5.1.1 References

The automatic transfer switches and all components shall be designed, manufactured and tested according to the latest applicable standards of UL and NEMA as follows:

- UL 1008 - Transfer Switches
- UL 991 - Tests for Safety-Related Controls Employing Solid-State Devices
- NFPA 70- National Electrical Code
- NFPA 99- Essential Electrical Systems of Health Care Facilities
- NFPA 110- Emergency and Standby Power Systems
- NEMA ICS 10 - AC Transfer Switch Equipment
- IEEE 446- Recommended Practice for Emergency and Standby Power Systems

B.5.1.2 References

The manufacturer of the assembly shall be the manufacturer of the major components within the assembly. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

B.5.2 Fabrication, Configuration and Requirements

Provide a molded case type breaker transfer switch. All breaker transfer switches shall be UL listed for application in their intended enclosures for 100% of their continuous ampere rating.

- The automatic transfer switch shall be of double throw construction operated by a reliable electrical mechanism momentarily energized.
- Each transfer switch shall be positively interlocked both mechanically and electrically to prevent simultaneous closing of both sources under either automatic or manual operation.
- Main contacts shall be silver composition and mechanically held in both normal and emergency positions.
- Switches shall operate delayed transition, with a time delay in the neutral position adjustable from 0 to 120 seconds.
- The switching panel shall consist of completely enclosed contact assemblies and a separate control or transformer panel. Control power for all transfer operations shall be derived from the line side of the source to which the load is being transferred. The transformer shall be multi-tap for ease of voltage adjustment in the field.
- Transfer switches shall be capable of being operated manually under full rated load conditions. Manual operation shall be accomplished by a permanently attached manual operator, or by integrally mounted pushbuttons. Removable manual operating handles and handles that may move in the event of an electrical operation during the manual operation, are not acceptable. Manual operators requiring source or load disconnection prior to manual operation are not acceptable.
- On transfer switches requiring a fourth pole for switching the neutral, the neutral shall be identical to the other power poles. Switched neutral poles which are add-on or overlap, or that are not capable of breaking full rated load current are not acceptable.
- On transfer switches requiring a solid neutral, the neutral shall be fully rated.
- Supply transfer switch in a NEMA 4X Stainless steel Enclosure.
- Controller Display and Keypad - The microprocessor-based controller display shall be UV resistant and include a 2-line, 16-character, backlit LCD display. The controller shall be capable of displaying transfer switch status, parameters, and diagnostic data. All set point parameters shall be password protected and programmable using the controller keypad or remotely using serial port access.
- Voltage and Frequency Sensing - The controller shall have a voltage range of 0-790 volts (50/60 Hz) and an accuracy of +/- 1% of nominal input voltage and a frequency range of 40-70 Hz and an accuracy of +/- .3 Hz.
- The normal and emergency sources shall include phase reversal protection. The preferred rotation is programmable as ABC or CBA
- Time Delays
- A time delay shall be provided on transfer to source 2, adjustable from 0 to 1800 seconds.
- A time delay shall be provided to override a momentary power outage or voltage fluctuation, adjustable from 0 to 120 seconds.
- A time delay shall be provided on retransfer from source 2 to source 1, adjustable from 0 to 1800 seconds.
- A time delay shall be provided after retransfer that allows the generator to run unloaded prior to shut down, adjustable from 0 to 1800 seconds.
- A time delay shall be provided for engine failure to start, fixed setting of 6 seconds.
- A pre-transfer time delay output adjustable from 0-120 seconds. The contact shall be a form-c contact rated for 10-Amp at 250-Vac and 10-Amp at 30-Vdc.

All delays shall be field adjustable from the microprocessor-based controller without the use of special tools.

C Construction

C.1 Motor Control Cabinet

Do not install damaged Motor Control Cabinet. Store Motor Control Cabinet in a clean, dry space. Protect units from dirt, fumes, water, construction debris and traffic.

C.2 Panel Boards

Obey the following directives for the installation of panelboards:

- Install panelboards according to NEMA PB 1.1.
- Install panelboards plumb. Install recessed panelboards flush with wall finishes.
- Height: 6 feet (1.8 m) to top of panelboard; install panelboards taller than 6 feet (1.8 m) with bottom no less than 4 inches (102 mm) above floor.
- Provide filler plates for unused spaces in panelboards.
- Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
- Provide engraved plastic nameplates under the provisions of Article 508-4.11 Electrical Identification.
- Minimum space for five spare conduits (future).
- No 2 size breakers shall be used.
- Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the running phase loads to within 10 percent of each other. Maintain proper phasing for multi wire branch circuits.

Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses. Take care to maintain proper phasing for multi-wire branch circuits. The engineer will witness this test.

Prior to energization of the panelboard:

- Megger check phase-to-phase and phase-to-ground insulation for proper resistance levels.

Check panelboard electrical circuits for continuity and for short-circuits.

C.3 Automatic Transfer Switch

Install per manufactures recommendations and contract drawings.

C.3.1 Factory Testing

The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be according to the latest version of UL and NEMA standards.

- Insulation check to ensure the integrity of insulation and continuity of the entire system
- Visual inspection to ensure that the switch matches the specification requirements and to verify that the fit and finish meet quality standards
- Mechanical tests to verify that the switch's power sections are free of mechanical hindrances
- Electrical tests to verify the complete electrical operation of the switch and to set up time delays and voltage sensing settings of the logic.

The manufacturer shall provide a certified copy of factory test reports. Transfer switch shall include a label indicating order number, catalog number and date.

D Measurement

The department will measure Power Distribution and Motor Control Center by each unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.032	Power Distribution and Motor Control Center	EACH

Payment is full compensation for furnishing and installing new electrical service, main disconnects, automatic transfer switches, panelboards, transformers and a motor control cabinet.

68. Limits and Sensors, Item SPV.0060.033.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, adjusting, calibrating, testing, and making fully operational new span position limits, brake limits, center lock limits, gate limits and span position inclinometers as indicated in the plans for the Cherry St. Bridge.

A.1 Scope

The work under this item includes the following:

- Span Seated Limit Switches
- Span Cam Limit Switches
- Span Position Inclinometers
- Center lock limit switches

Adjustment of integral limits of equipment such as brakes and traffic gates.

A.2 Related Provisions

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC Controls - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable
- Architectural Exterior Bridge LED Lighting
- Illuminated Bridge Signs

B Materials

B.1 Plunger Type Limits - Seated

Furnish and install new heavy-duty plunger type limits switches designed for the movable bridge industry. Provide the switch with a stainless-steel housing. Provide switch with a stainless-steel plunger and a ball end extension that allows for a minimum of 0.75" field adjustment.

The trip plate shall be spring loaded with an over center mechanism to provide simultaneous, positive, accurate and repeatable snap action of all switches. Provide 4 circuits with snap action microswitches rated at 40 amp make, 15-amp break at 120 volts.

B.2 Rotating Cam Limit Switch – Span Position

Furnish 6 circuit rotating cam limits in a NEMA 4X stainless steel enclosure, a straight drive and SPDT snap action type switches with a minimum 10 amp rating at 120 VAC. Furnish and install a bellows style coupling with bores to match the existing stub shaft and cam limit. Verify the shaft diameters.

B.3 Inclinator – Span Position Transmitter

Install a leaf angle position transmitter/inclinometer to the bascule girder at a suitable location to the centerline of bridge rotation as practical. Power unit with 120 VAC and provide a voltage or current output signal relative to leaf angle. This output signal is 4 to 20 mA as required to properly interface with the PLC. House position transmitters in a NEMA 4X rated enclosures with terminal blocks, and power supply as required for connecting to power source and angle position meters. The position transmitter itself is adjustable and calibratable without having to physically move the NEMA enclosure.

Do not exceed 0.01 percent per °C for the position transmitter temperature drift. Have suitable vibration resistance and dampening for a bridge leaf application. Non-Linearity is $<1 \times 10^{-3}$ full scale. Transverse sensitivity is < 1 percent at 45-degree tilt.

B.4 Lever Arm Limits – Center Locks

Provide electro-mechanical, lever-operated limit switches for centerlock open(pulled) and closed (driven) indication. Switch contacts shall be double pole double throw (DPDT) rated 10A at 120 VAC. Both contacts shall be operated by the same armature. Supply switches that are heavy duty NEMA Type 4 Construction.

B.5 Proximity Type Limits

Provide non-contact, magnetically operated proximity style switches. Switch contacts shall be DPDT rated 10A at 120 VAC. Both contacts shall be operated by the same armature. Supply switches that are heavy duty NEMA Type 4 Construction with a stainless-Steel housing and temperature rating between -40 °C and 105 °C.

C Construction

Install limit switches according to manufacturer's instructions. Provide all mounting hardware and supports as required. The method of mounting and hardware allows for field adjustment at construction and for future maintenance. Terminate all limit switches on terminal blocks. Install drainage "T" below takeoff for limit switches on all applicable conduit runs. Submit to the engineer, for review, prior to installation the limit switch target materials, shapes, and mounting methods.

C.1 Installation

Fabricate brackets out of stainless-steel material with 3-axis adjustability. Use stainless steel material for all mounting hardware. Use painted steel for sensing plates of proximity style limits.

C.2 Testing

After installation, test switches, in the presence of the engineer, to determine if operation is as intended. Switches will relay signal to the control console and/or control panel at intended "point of operation." Switches will provide positive indications with no intermittent signals or flickering of lights on control console. Adjust position of switches as required.

D Measurement

The department will measure Limits and Sensors by each unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.033	Limits and Sensors	EACH

Payment is full compensation for furnishing and installing limits and sensors.

69. Training, Manuals and Spare Parts, Item SPV.0060.034.

A Description

This special provision describes testing of equipment, training of personnel, provision of spare parts, and the provision of operation and maintenance manuals for the movable bridge electrical and mechanical systems installed on the bridge. This includes testing at the factory, preliminary onsite testing, and final acceptance testing. Provide manuals for both operations and maintenance. Training shall include separate sessions for both the bridge operators and the bridge maintenance personnel.

A.1 Related Provisions

Unless otherwise noted, provide work under this special provision to conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC Controls - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Auxiliary Electrical Equipment
- Submarine Cable
- Architectural Exterior Bridge LED Lighting
- Illuminated Bridge Signs
- Shop Drawings and Submittals
- Bridge Machinery-General

B Materials

B.1 Operator and Maintenance Manuals

Clearly print all materials so that the submittals, drawings, catalogue cuts and all other information is legible, accurate and distinct. Ensure that reduced size drawings and illustrations are such that lettering, and dimensioning are readable. Fold drawings to the page size necessary for inclusion in the manuals. Print the material on durable mediums with water resistant inks. Use printing methods that offer permanence and durability.

B.1.1 Operator Manuals

Include the following sections, and/or chapters in the operator's manual at a minimum. Use tabbed dividers for each section.

TABLE OF CONTENTS

Identify the title of each chapter.

CONDENSED OPERATOR INSTRUCTION

Provide a condensed set of instructions for the operator with simple, one (1) to four (4) word descriptions of each step (for example lower near on-coming gate). Write separate instructions for manual and automatic operations. With each set of instructions, provide a console layout with the switches and pushbuttons sequence labeled with a number that is associated with the instructions. Provide separate sheets for manual open, manual close, automatic open and automatic close.

DETAILED OPERATOR INSTRUCTION

Write a detailed set of operator instructions that describes every step in the sequence for both manual and automatic operations. Describe, in detail, each step of the operation. Steps in this sequence should include any visual and audio checks of roadway or waterway prior to making a movement.

BYPASS INSTRUCTIONS

Describe how and when to use each bypass switch. Emphasize the dangers of using a bypass and the importance fixing the problem.

ALARM LIST

Include all alarms with their definition.

EMERGENCY CALL LIST

Include a list of local municipality emergency contacts, phone numbers and addresses, city contacts and numbers and the contractor's emergency call number. Consult the city for the key contacts.

B.1.2 Maintenance Manuals

At a minimum include the following sections, and/or chapters in the maintenance manuals. Use tabbed dividers for each section.

TABLE OF CONTENTS

Identify the title of each chapter.

CONDENSED OPERATOR INSTRUCTION

Provide a condensed set of instructions for the operator with simple, one to four word, descriptions of each step (for example lower near on-coming gate). Write separate instructions for manual and automatic operations. With each set of instructions, provide a console layout with the switches and pushbuttons sequence labeled with a number that is associated with the instructions. Provide separate sheets for manual open, manual close, automatic open and automatic close.

DETAILED OPERATOR INSTRUCTION

Write a detailed set of operator instructions that describes every step in the sequence for both manual and automatic operations. Describe in detail each step of the operation. Steps in this sequence should include any visual and audio checks of roadway or waterway prior to making a movement.

BYPASS INSTRUCTIONS

Describe how and when to use each bypass switch. Emphasize the dangers of using a bypass and the importance fixing the problem.

ALARM LIST

Include all alarms with their definition.

EMERGENCY CALL LIST

A list of the names addresses and telephone numbers of all subcontractors and manufacturers furnishing and installing the equipment and systems together with a record of the local representatives for the equipment and systems installed.

VIDEO AND CAMERA INSTRUCTIONS

Include instructions for setting up presets on cameras, recording video and burning it to DVD.

ALARM AND DATA PRINTING AND COPYING INSTRUCTIONS

Include instructions for printing and copying alarms to DVD.

SETPOINT ADJUSTMENTS

Describe how to adjust setpoints on the operator interface. Include a description of each setpoint, the as-built setting and the range.

ELECTRICAL SCHEMATICS

Fold 11-inch by 17-inch final as-built schematics. Include new components and existing components being reused where applicable.

MECHANICAL DRAWINGS

Fold 11-inch by 17-inch final as-built schematics. Include new components and existing components being reused where applicable. Also, include drawings of certified parts and proprietary units.

MOTOR MEGGER READINGS

Include all motor readings in a table with a column for as-built and a column to be used yearly for the next 20 years.

SPARE PARTS LIST

Furnish a complete list of each spare part, including, their manufacturer and part number and the quantity supplied.

COMPLETE PARTS LIST

Furnish a complete parts list that describes every electrical, mechanical or hydraulic component furnished. Include manufacturer literature, cutsheets and instruction manuals for all components. Divide the parts into chapters with similar components. Include a cover sheet for each chapter with all part descriptions, their numbers and manufacturer included. A separate binder is recommended for the complete parts list.

MAINTENANCE SCHEDULES AND LUBRICATION

Recommended procedures and frequency for cursory and detailed inspections of the electrical and mechanical equipment. Provide lubrication charts.

TROUBLESHOOTING PROCEDURES

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.

WARRANTY

Provide warranty documentation of all equipment, including start and end dates of warranty periods.

B.2 Spare Parts

B.2.1 General

Furnish the following spare parts:

- A minimum two limit or proximity switches of each type installed, including limit lever arms.
- A minimum of one operating coil for every ten of each size contactor installed.
- A minimum of one relay for every ten of each kind and size of control, timing, or overload relay installed.
- A minimum of three heaters for every ten thermal overload relays of each size.
- A minimum of three spare fuses of each size and type used throughout the bridge.
- A minimum of ten spare indicator lamps of every type used. Include lamp extractor(s).
- A minimum of one PLC card for every five of each type installed, including power supplies, I/O cards and communication modules.
- A minimum of one power supply, electronic module and/or converter for every five of each type installed.
- One spare inclinometer
- One complete camera assembly with cables, lens, lens filters, transient suppressors, power supplies, manuals and accessories.
- Other spare parts as called out in individual sections.
- One spare traffic gate arm (complete with lights, and striping) in proper length
- One spare motor for traffic gates
- One spare limit switch for traffic gates

- Six spare warning lights for traffic gates
- One spare gate operator motor and gearbox for each type of gate installed.
- For interior and walkway lights, five spare lamps of each size and type used.

For Navigational lights (LED) - two spare fixtures of each size, type and color used.

Provide spare parts in sealed, uniform-sized cartons, with typed and clearly varnished labels to indicate their contents and store them in a lockable box. Also, provide a directory of permanent type describing the parts. The directory must state the name of each part, the manufacturer's number, and the rating of the device for which the part is a spare. Mark spare parts to correspond with their respective item numbers as indicated on the elementary wiring diagram. Plastic laminate and store in the same cabinet the schematic diagrams for the control console.

B.2.2 Mechanical Spare Parts

B.2.2.1 Spare Lubricant

Furnish the bridge with an appropriate amount of proper lubricant. Store the lubricant in steel containers at room temperature. Store, at the site, the following amounts of additional lubricant:

Gear Reducer Oil:	55 gallons
Open Gear Grease:	20 pounds
Bearing Grease:	20 pounds
Gear Coupling Lubricant:	5 pounds

Keep the lubricant for each type of machinery component separately in clearly marked containers. Take all measure necessary to prevent lubricant contamination.

B.2.2.2 Spare Parts and Tools

Provide the following spare parts and tools to the city, along with all spare parts required in other articles. Spare parts and tools are considered incidental to the component to which they apply and will be paid for as such.

- Two wrenches, drop forged steel, of a standard tool manufacturer, for all fasteners larger than 1½ inches.
- One set of seals for all speed reducer shafts.
- One tool box of suitable size for the wrenches provided.
- One breather for each reducer provided.

C Construction

C.1 Operator and Maintenance Manuals

Bind all manuals in heavy duty white three-ring binders with stiff plastic covers that are moisture, oil, and grease resistant. Provide binder sizes of approximately 9 x 12 inches. Use plastic dividers with tabs to divide each chapter. Use reinforced edge sheets for all copies for binder holes. Number all pages with the chapter and page (for example II-4).

Label the edge of each binder with a type written label with the title of manual and the bridge name. Label the front cover with a type written sheet indicating the title, the bridge name, structure number, project and date.

C.2 Training

C.2.1 Operator Training

Provide Operator training in two 8-hour sessions held at the bridge and one hour held at the Knapp St. Bridge. Design each session for up to six people. Provide a syllabus, a copy of the operator instructions, a pad of paper and pen to each trainee. Include the following as part of the training:

INTRODUCTION

Start each session shall start with a brief description of the work performed and the features of the bridge. Following the description, open the bridge as a demonstration. Provide a tour of near side piers and machinery rooms.

OPERATOR INSTRUCTIONS

Explain the operation of the bridge using the instructions as an aide. Discuss and demonstrate each mode of operation. Demonstrate how to use the HMI operator station including how to interpret and acknowledge the alarms.

TRAINEE OPENINGS

Each trainee will be required to open the bridge at least four times: two of the four openings under normal automatic mode; one opening using manual mode; and the last operation using a bypass. During the bypass operation, create a simple scenario that would require the use of a bypass. The scenarios shall be simple and should not risk damage to equipment. Before using the bypass, investigate the problem to determine if it is safe to operate. Record each opening with time, date, operator, and a witness for a record of the training. Training should include the use of the public addressing system, CCTV system, locally and remote.

SUMMARY

At the end of the day, summarize the training and emphasize the use of indications and the operator interface to diagnose a problem.

Provide training for the following two levels:

General Operator Training

Lead Worker Training. Lead workers are those who need to know how to operate the bridge in bypass mode.

C.2.2 Maintenance Training

Provide Maintenance training in two 8-hour sessions. Design one session for the classroom and one session at the bridge for up to eight people. Provide a syllabus, a copy of the operator instructions, a pad of paper and pen to each trainee.

CLASSROOM

INTRODUCTION

Start each session shall start with a brief description of the work performed and the features of the bridge.

OPERATOR INSTRUCTIONS

Explain the operation of the bridge using the instructions as an aide.

MECHANICAL

Include an overview of the mechanical gearing, brakes and center lock systems. Provide a lubrication schedule and instructions on how to properly lubricate each item.

ELECTRICAL

Explain how to read and use the electrical schematics to locate problems.

PLC

Provide a brief description of a PLC and how to interpret a rung of logic. Include a demonstration on how to access the online programming.

BRIDGE

BRIDGE TOUR

Prior to the tour, open the bridge to demonstrate the operation. Tour the near side pier, roadway and machinery rooms.

TRAINEE OPENINGS

Each trainee will be required to open the bridge at least one time in automatic mode.

MECHANICAL

Demonstrate how to lubricate, maintain and repair the mechanical equipment on the bridge.

ELECTRICAL

Demonstrate where and how to isolate power, adjust limits, adjust cameras, connect to the PLC and print reports.

TROUBLESHOOTING AIDES

Explain and demonstrate control system aides such as indicator lights, alarms and data logs. Create at least four scenarios that prevent bridge operation and have the trainees use the aides to identify and repair the problem.

C.2.3 Submittals

Submit PDF sample copies of each manual and a training syllabus for approval prior to any training.

Submit five copies of the manuals and two CDs with electronic copies in adobe acrobat format.

D Measurement

The department will measure Training, Manuals and Spare Parts 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.0060.034	Training, Manuals and Spare Parts	EACH

Payment is full compensation for furnishing manuals and spare parts and providing training to operators and maintenance personnel.

70. Auxiliary Electrical Equipment, Item SPV.0060.035.

A Description

This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, testing, and making fully operational miscellaneous electrical auxiliary equipment. The following equipment is included in this provision:

- Commercial Fire and Security System
- Airhorn
- Navigational Lights
- Sump Pump
- Heat tracing and insulation for the sump pump discharge lines.
- Marine Radio

A.1 References

In addition to those listed in article "Definitions and Acronyms", numerous acronyms are used in this special provision. Interpret acronyms used throughout as follows:

AGC Automatic Gain Control

BNC Bayonet Neill Concelman (Connector)

CCD Charged Coupled Device

Cd Candela

CD Compact disc

dB Decibel

DVR Digital Video Recorder

DSL Digital Subscriber Line

IP Internet Protocol

PA/IC	Public Address/Intercom
RH	Relative Humidity
TV	Television
THD	Total Harmonic Distortion
UV	Ultra-violet
XGA	eXtended Graphics Array
SXGA	Super eXtended Graphics Array

A.2 Related Provisions

Unless otherwise noted, work under this special provision shall conform to the requirements of the following special provisions:

- Bridge Electrical Work
- Span Drives and Motors
- Control Console - Cherry St.
- PLC Controls - Cherry St.
- PLC and Communication Modifications - Knapp St. Bridge
- Power Distribution and Motor Control Center
- Traffic Gates and Signals
- Lightning and Surge Suppression
- Limits and Sensors
- Training, Manuals and Spare Parts
- Auxiliary Electrical Equipment
- Submarine Cable
- Architectural Exterior Bridge LED Lighting
- Illuminated Bridge Signs

B Materials

B.1 Navigation Horn

Furnish and install an electrical marine weatherproof horn capable of producing 120 dB (as measured at a distance 10 feet) at 320 cycles per second. Navigational Lights

Provide a complete navigation hazard lighting system operating at 120 VAC and complying with USCG CFR I 18.80(b) consisting of two types of lights. The Fender/Pier lights are mounted on the protective fender piers in the four quadrants and on the front walls of the bascule piers. The Channel Lights define the center of the navigation channel and are mounted to the bascule bridge at mid span.

Furnish all Fender and Channel lights with shock proof LED lamps and surge suppressors. Lamps shall consist of 48 individual LED beams arranged in four tiers in an optically clear elastomer medium. The viewing angle of the individual LED beams shall not be less than 22 degrees for red, 20 degrees for green. The MTBF rating of the LED's shall be 100,000 hours. Lamp base shall be Rynite FR350 or approved equal. Provide lamp lens of UV Polycarbonate. Wattage consumption should not exceed 1.8 watts for red, 1.44 watts for green. Candela output should be not less than 78 candela for red, 270 candela for green. Provide lamps with integral surge suppression with a clamping voltage of not less than 380 VAC at two A. Provide clear silicon filled lamps that have been field tested and documented for not less than six months continuous service in extremely high vibration movable bridge applications.

B.1.1 Fender/Pier Lights

Furnish and install unpainted housings of cast aluminum construction with a one inch threaded conduit opening at the bottom, equipped with a red 180°, standard marine Fresnel type, rigid, heat resistant glass lens, 7- to 8-inch diameter. Furnish manufacturer's recommended wall mounting bracket and 90° post. Furnish all stainless steel closure bolts, lens tie rods, and attachment hardware. Use only marine type junction boxes. All joints, including lid shall be sealed with weatherproof gaskets. All fastenings shall be tamper resistant. Access cover shall require a special wrench.

B.1.2 Channel Lights

Furnish and install unpainted housings of cast aluminum with cushioned lenses, weatherproof gasketed joints and large service access door equipped with 180°, standard marine molded single-piece Fresnel type, rigid, heat resistant glass, 7- to 8-inch diameter. with the Lower Section; Red, Upper Section; Green. Furnish all stainless steel closure bolts, lens tie rods, and attachment hardware. Ensure swivel assembly is cast bronze housing and bracket with stainless steel pivot, watertight "O" ring seal, bronze bearings, cable entrance fitting, and #35 stainless steel service chain rated for 225 pounds. Use a hanger stem 1½-or 2-inch galvanized pipe as recommended by manufacturer with anti-swing brake and automatic lock.

B.2 Sump Pump

Provide sump pump capable of pumping 45 gallons per minute with a head of 32 feet. Pump shall be sewage duty rated with the ability to pass 2 inch spherical solids.

Pump and motor housing, switch case, and base to be of cast iron construction with a non- clogging, vortex type bronze class 85-5-5-5 impeller and all stainless steel hardware. Pumps shall be UL approved.

- Pump motor shaft output must be 375 watts minimum, three phase, 208 VAC, 60 Hz with motor control via a remote start stop station mounted at pier level +3.0. Protect the pump motor with a GFI rated breaker in the panelboard.
- Power for sump pump supplied from dedicated 3 phase 4-wire watertight 250 volt rated twist lock type plug and receptacle similar to Hubbell parts HBL420P9W, BB2030N, HBL420R9W and all necessary accessories. Mount receptacle a 42" above the highest grade of the counterweight pit floor.
- Provide 316 grade stainless steel hardware for all anchors and fasteners. Submit shop drawings that include dimensioned layout drawings and data sheets for sump, mesh screen, conduits, and all related components.

B.2.1 Heat Tracing

Provide self-regulating industrial grade flexible heat tracing for freeze protection for the sump discharge line, incoming water line and wastewater drain line. Heat tracing must account for a minimum ambient temperature of -40 °F and include providing a 2-inch thickness of insulation. Heat tracing should be Chromalox SRF/P series, Raychem BTV series, BriskHeat SL series, or approved equal. Provide junction box, power termination and end seal fitting. Provide aluminum tape and caution labels.

B.3 VHF Marine Radio

Provide a separate, battery powered, marine radio VHF transceiver (157 - 160 MHz) with an output of 1.0 watts capable of scanning channels 9 and 16, transmitting on at least three additional channels as required by the engineer. Couple the system to a stainless steel or fiberglass whip antenna of 39 inches in length mounted as directed by the engineer. Ensure the Maximum audio distortion is less than five (5) percent. Radio must comply with FCC Rules and Regulations, Part 80. Provide a battery charger capable of maintaining the radio battery fully charged.

B.4 Badge Entry System for Lockable Doors of Operator House

Provide a Badge Entry System for Lockable Doors of Operator House.

B.5 Badge Entry System for Lockable Doors of Operator House

Provide a wall mounted warning bell as manufactured by Edwards Signal model 340-4N5. Gong size to be 4 inches. No other warning bells shall be approved. The warning bell shall be mounted on a single gang electrical junction box. Provide the required conduit and conductors from the control console to the wall mount location.

C Construction

C.1 Sump Pump

Confirm available voltage for sump pump matches manufacturer's specifications. Install all equipment and fasteners according to manufacturer's instructions. Verify the installation and operation at the rated throughput. Verify current drawn and power consumption is within limits specified by the lighting panel breakers and conductors. Refer to the contract plans for details.

C.2 Heat Trace

Remove and dispose of existing heat tracing and associated insulation for the incoming water line and waste water drain line.

D Measurement

The department will measure Auxiliary Electrical Equipment by each unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.035	Auxiliary Electrical Equipment	EACH

Payment is full compensation for furnishing and installing the electrical equipment.

71. Bent C Structural Steel Repairs, SPV.0060.036.

A Description

This special provision describes removing and replacing deteriorated top beam (W30x108) of the Bent C, connection angles, stiffeners between top beam and roadway stringers, providing temporary supports for roadway stringers connected to Bent C during the removal and replacement of top beam and removing and replacing column base angles and plates at Bent as shown on the plans and specified herein.

B Materials

Furnish steel W-shapes, angles, plates and connection hardware conforming to Section 506 of the Standard Specifications. Use high strength structural steel conforming to ASTM A 709, grade 50. Prior to painting, hot-dip galvanize all new structural steel. All of the requirements in the article, Fracture Control Plan provided under special provision "Bridge Structural Steel, Item SPV.0085.001", shall apply.

Paint all new structural steel according to "Painting Epoxy System Structure, P-40-864".

C Construction

Perform this work according to the applicable provision of Section 506 of the Standard Specifications.

Neatly remove deteriorated portions of Bent C that requires removal and replacement. In the event that damage does occur to any item that is designated to remain as part of Bent C, repair or replace the damaged item at no expense to the department. Similarly, if any fasteners, anchors or concrete areas are damaged during the removal; replace the damaged fasteners, anchors and provide required concrete repairs at no expense to the department.

Dispose of removed steel.

Attach replacement elements as shown on the plans by bolting.

Provide adequate shoring for each roadway stringer prior to removal of any cap beam components of Bent C. Keep in place and maintain the integrity of temporary shoring before top beam is completely removed and replaced and all other required repairs on Bent C are performed, and roadway stringers are reconnected to the top beam of Bent C.

The suggested temporary shoring arrangements shown on the plans are conceptual. Prepare complete design computations and supporting details for the specific elements of the shoring system proposed, accounting for roadway stringer reactions at the Bent C. Prepare and submit fabrication drawings and erection diagrams for the temporary shoring system. Submit design calculations, prepared by a professional engineer licensed in the State of Wisconsin for the shoring system based on the proposed sequence of work. Follow the sequence of work upon which the proposed shoring system design and supporting calculations are based during rehabilitation of the Bent C. A different sequence may later be followed only if new supporting information for it is prepared and re-submitted for review and re-approved by the engineer.

D Measurement

The department will measure Bent C Structural Steel Repairs by each bent C repaired, including the provision of temporary shoring required within each bascule pier, 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.0060.036	Bent C Structural Steel Repairs	EACH

Payment is full compensation removing deteriorated portions of Bent C top beam, connection angles and stiffeners between top beam and roadway stringers, base angles and plates including their connecting rivets; furnishing and installing replacement elements including connecting bolts and fill plates; designing, detailing, furnishing and installing temporary shoring of the roadway stringers attached to Bent C and removal of the shoring after completion of work.

72. Tree Protection, Item SPV.0060.037.

A Description

This special provision describes the protection of trees at locations as indicated on the plans. All tree protection shall be coordinated with City Forester, including inspection of tree protection measures.

B Materials

Use orange construction type fencing that is 4-foot in height with steel supporting posts 5-foot to 8-foot on center for tree protection fencing. Furnish all other materials necessary to erect the fencing.

C Construction

Do not grade, excavate, full depth saw cut sidewalk or otherwise disturb the area within 5 feet of any tree as measured from the outside edge of the tree trunk or visible aboveground portion of the root system along the length of the terrace, without prior permission from the City Forestry Representative.

All roots over 1 inch in diameter that are damaged shall be cleanly cut immediately in back of the damaged section on the same day of the excavation. Cuts may be made with lopping shears, chainsaw, stump grinder, sawzall or other means which will produce a clean cut. Exposed roots should be covered as soon as excavation and installation are complete.

Do not rip or pull roots out towards the trunk of a tree while excavating with a backhoe. The use of a backhoe to clean cut roots is NOT acceptable.

Curb Excavation and Installation.

Root masses that grow very close to, up to or over curb will require extra care during excavation. Curb modifications may be necessary as determined by the engineer or City Forester, such as curving into the direction of the street to avoid damage to the root system or hand formed curb.

All roots over 1 inch in diameter that are damaged shall be cleanly cut immediately back of the damaged section on the same day of the excavation. Cuts may be made with lopping shears, chainsaw, stump grinder, sawzall or other means which will produce a clean cut. Exposed roots should be covered as soon as excavation and installation are complete.

The City Forester will review curb and gutter that is marked for removal and adjacent to street trees. Forestry will mark curb and gutter with "NRC" (No Root Cutting) next to trees that curb and gutter removal and replacement has a greater potential to damage tree roots. The contractor shall proceed in the following sequence to repair sidewalk marked with NRC as follows:

- Place a yellow ribbon around the tree marked NRC at approximately 4-feet from the ground in order to highlight these trees for the equipment operator removing the concrete;
- Ribbon shall remain until forms have been removed;
- Carefully remove the concrete curb and gutter so marked and those adjacent curb and gutter sections 6 feet on either side of the visible root flair without excavating into the terrace or without damaging roots;
- At the city's discretion, install a type II barricade;

- Await inspection by Forester, who shall determine which roots can or cannot be cut or shaved, how much excavation can be safely allowed and communicate his/her findings to the contractor and the Engineering Construction Inspector. After the contractor notifies the City Forestry staff that the removals are complete and ready for their determination, the City Forestry staff shall respond by the end of the following work day. Rain days, weekends and holidays do not count as a work day for this purpose;
- Proceed to cut or shave roots in the presence and under the direction of the Forester.

At locations where the curb and gutter is to be removed and replaced that are adjacent to street trees that are not marked "NRC", the contractor can remove the concrete and underlying soil to sub-grade without notification to the City Forestry Representative.

Curb excavations shall be limited to 1 foot behind the proposed curb for trees less than 10" in DBH (Diameter at Breast Height), for a distance of 10 feet each way from a tree trunk to reduce damage to the root system.

Curb excavations shall be limited to 6 inches behind proposed curb for trees greater than 10" DBH, or street terrace widths less than 6 feet for a distance of 10 feet each way from a tree trunk to reduce damage to the root system.

When excavation behind the curb is limited to less than 6 inches, the new curb must be a 'handformed' replacement for a minimum length as directed by the engineer.

Contractor shall not cut any roots that are 3" or larger in diameter without prior permission from the City Forestry Representative for curb and gutter installation.

In situations where root severing has to occur, the root cutting will be clean cuts – not jagged or ripped. The use of a Backhoe to clean cut tree roots is NOT acceptable.

All roots over 1 inch in diameter that are damaged shall be cleanly cut immediately back of the damaged section on the same day of the excavation. Cuts may be made with lopping shears, chainsaw, stump grinder, sawzall or other means which will produce a clean cut. Exposed roots should be covered as soon as excavation and installation are complete.

Sidewalk Excavation and Installation.

The City Forester will review sidewalk that is marked for removal and adjacent to street trees. Forestry will mark sidewalk with "NRC" (No Root Cutting) next to trees that sidewalk removal and replacement has a greater potential to damage tree roots. The contractor shall proceed in the following sequence to repair sidewalk marked with NRC as follows:

- Place a yellow ribbon around the tree marked NRC at approximately 4-feet from the ground in order to highlight these trees for the equipment operator removing the concrete;
- Ribbon shall remain until forms have been removed;
- Carefully remove the concrete sidewalk so marked and those adjacent sidewalk sections six (6) feet on either side of the visible root flair without damaging roots;
- At the city's discretion, install a type II barricade;
- Await inspection by Forester, who shall determine which roots can or cannot be cut or shaved and communicate his/her findings to the contractor and the Engineering Construction Inspector. After the contractor notifies the City Forestry staff that the removals are complete and ready for their determination, the City Forestry staff shall respond by then end of next work day. Rain days, weekends and holidays do not count as a work day for this purpose;
- Proceed to cut or shave roots in the presence and under the direction of the Forester;
- Install the granular sub-base, 3-inch minimum depth if the sub-grade is not acceptable, and new concrete sidewalk, 5-inch minimum depth;
- Remove ribbon.

At locations where the sidewalk is to be removed and replaced that are adjacent to street trees that are not marked "NRC", the contractor can remove the concrete and underlying soil to sub-grade without notification to the City Forestry Representative. The contractor and the city shall review the construction site for privately owned trees (on private property, but near the sidewalk to be removed) that could require the above process. In those cases, the trees shall be reviewed on a case-by-case basis with the property owner.

Contractor shall not cut any roots that are 3” or larger in diameter without prior permission from the City Forestry Representative for sidewalk installation or repair within 5 feet of any tree located in the terrace as measured from the outside edge of the tree trunk or visible aboveground portion of the root system. In situations where root severing has to occur, the root cutting will be clean cuts – not jagged or ripped. The use of a backhoe to clean cut tree roots is NOT acceptable. All roots over 1 inch in diameter that are damaged shall be cleanly cut immediately back of the damaged section on the same day of excavation. Exposed roots should be covered as soon as excavation and installation are complete.

Root Cutting / Root Grinding.

Roots shall be cut or ground as specified by the City Forestry Representative. This cutting or grinding shall require the use of tools such as: stump grinders; lopping shears; root saws; sawzall; front mounted stump or wheel grinders; and chainsaws. Unless otherwise specified the contractor shall be paid per linear foot for Root Cutting for the length of the NRC Curb or NRC sidewalk, with a maximum length of 15 linear feet per location

D Measurement

The department will measure Tree Protection 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.0060.037	Tree Protection	EACH

Payment includes all equipment, labor and materials necessary to complete this item as specified.

73. Marking Yield Line Epoxy 36-inch, Item SPV.0060.038.

A Description

This special provision describes providing pavement markings at the locations shown on the plans and as directed by the engineer.

B Materials

Provide materials conforming to standard spec 646.2.

C Construction

Construct markings conforming to standard spec 646.3.

D Measurement

The department will measure Marking Yield Line Epoxy 36-Inch as each individual triangle in the yield line.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.038	Marking Yield Line Epoxy 36-Inch	EACH

Payment for the marking bid items under this section is full compensation for grooving pavement surface and providing the marking.

74. Adjusting Sanitary Manhole Covers, Item SPV.0060.039.

A Description

Perform work according to the applicable provisions of standard spec 611, as detailed in the plans, and as hereinafter provided.

B Materials

Furnish round high-density polyethylene (HDPE) adjusting rings from the department’s approved product list. Provide approval butyl sealant between adjusting rings as recommended by manufacturer.

C Construction

Unless the contract provides otherwise, adjust existing covers, including frames and grates or lids, to the required elevation. Remove the existing fixture, adjust the top of the existing structure, and reinstall the fixture. Support the fixture on HDPE adjusting rings, constructed to hold the covers firmly in place. Set the manhole frames so that they comply with the surface requirements of standard spec 450.3.2.9. At the completion of the paving, a 6-foot straightedge shall be placed over the centerline of each manhole frame parallel to the direction of traffic. A measurement shall be made at each side of the frame. The two measurements shall be averaged. If this average is greater than 5/8 inches, reset the manhole frame to the correct plane and elevation. If this average is 5/8 inches or less but greater than 3/8 inches, the manhole frame shall be allowed to remain in place but shall be paid for at 50 percent of the contract unit price. If the manhole frame is higher than the adjacent pavement, the two measurements shall be made at each end of the straightedge. These two measurements shall be averaged. The same criteria for acceptance and payment as above, shall apply.

D Measurement

The department will measure Adjusting Sanitary Manhole Covers 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.0060.039	Adjusting Sanitary Manhole Covers	EACH

Payment is full compensation for providing required materials, exclusive of frames, grates, or lids available and designated for adjusting; and for removing, reinstalling, and adjusting the covers. The contractor shall replace covers rendered unusable by the contractor’s operations, at no expense to the department.

75. Luminaires Utility LED, Item SPV.0060.040.

A Description

This special provision describes furnishing and installing a LED luminaire fixture according to the pertinent provisions of standard spec 659 and as hereinafter provided. Specific items are noted in the plans.

B Materials

Furnish Eaton NVN Navion Model #NVN-AF-02-D-U-T3R-10K-BK luminaire fixtures. The luminaire fixture shall be black.

C Construction

Install luminaire fixture according to standard spec 659.3.

D Measurement

The department will measure Luminaires Utility LED 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.0060.040	Luminaires Utility LED	EACH

Payment is full compensation for providing materials including luminaires, fittings, brackets, hardware and attachments; and for luminaire fusing.

76. Salvage Existing Traffic Signal and Lighting Equipment, Item SPV.0060.041.

A Description

This special provision describes removing and salvaging existing traffic signal and lighting equipment including removing electrical wire at all the locations specified in the plans and as hereinafter provided. Specific salvage items are noted in the plans.

B (Vacant)

C Construction

Arrange for the de-energizing of the signal and lighting system with the local electrical utility after receiving approval from the engineer that the existing systems can be removed.

Notify the engineer and Eng-Kie Lee of the City of Milwaukee, (414) 286-2174 at least three working days prior to the removal of the signal and lighting equipment. Complete this work immediately following shut down of equipment.

Salvage poles, trombone arms, signal heads, light poles, luminaire arms, and luminaire fixtures per plan from their concrete footing and disassemble out of traffic according to standard spec 204 and as shown on the plans. Remove wiring/cabling from the pole and dispose of off city right-of-way. Ensure that access handhold doors and hardware remain intact. Make a reasonable effort to inspect salvaged equipment for damage or defects.

Coordinate with Eng-Kie Lee of the City of Milwaukee, (414) 286-2174 to determine an acceptable location to stockpile salvaged equipment to be retained for the City of Milwaukee to pick up.

D Measurement

The department will measure Salvage Existing Traffic Signal and Lighting Equipment as each unit of work, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.041	Salvage Existing Traffic Signal and Lighting Equipment	EACH

Payment is full compensation for removing, salvaging, disassembling, disposing of scrap material, and protecting from damage.

77. Utility Line Opening (ULO), Item SPV.0060.042.

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.0060.042	Utility Line Opening (ULO)	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.

78. Milwaukee Light Base Type 1, Item SPV.0060.043.

A Description

Construct and pour 22-Inch Dia. x 36-Inch deep concrete base with 11-inch bolt circle according to current City of Milwaukee design standards and with the Wisconsin Standard Specifications for Highway and Structure Construction (WSSHSC).

B Materials

Use 18-inch minimum radius schedule 40 PVC electrical conduit conforming to the electrical conduit specified in standard spec 652.

Furnish four ¾ inch diameter by 3 feet L-bolts, nuts, and washers conforming to ASTM F1554, grade 105. Hot-dip galvanized the entire length of the L-bolts, and the nuts and washers conforming to ASTM A153. Thread at least 12 inches of the anchor rod. Use zinc coated nuts manufactured with sufficient allowance to allow nuts to run freely on the threads. Refer to corresponding detail drawing in plan set for additional material info and sizes.

Furnish ½” reinforced bar steel conforming to 505.2 (WSSHSC)

Furnish grade A, A-FA, A-S, A-T, A-IS, or A-IP concrete conforming to standard spec 501.2 as modified in standard spec 716. Provide QMP for class III ancillary concrete as specified in standard spec 716.

C Construction

Construct concrete base including necessary hardware, of specified type according to current City of Milwaukee design methods and standards.

Construct concrete bases as specified in standard spec 501, and provide the surface finished specified in standard spec 502.3.7.2 and plan details. Inspect the forming and applicable reinforcement for concrete bases before pouring the concrete. Cure exposed portions of concrete bases as specified in standard spec 415.3.12 except the contractor may use curing compound conforming to standard spec 501.2.9..

Wait at least 7 days before installing poles.

D Measurement

The department will measure each Milwaukee Light Base Type by each, 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.0060.043	Milwaukee Light Base Type 1	EACH

Payment is full compensation for furnishing and installing the base.

79. Equipment Grounding Electrode, Item SPV.0060.044.

A Description

Furnish and install grounding protection to provide personnel and equipment protection against faults, surge currents and lightning transients.

B Materials

Ground Rod – Use ground rods meeting the requirement of UL-467. Ground rods must be made of copper-clad steel with a nominal diameter of 5/8 inches. Ground rod sections must be a minimum of eight feet in length and manufactured for the sole purpose of providing electrical grounding.

Grounding Conductors – Use 7 strand #6 AWG copper insulated (green) conductor for electrical protection ground. The grounding conductor shall be continuous without splices from the grounding electrode through the handhole grounding clip of the pole and of minimum length to make connection.

Mechanical bonding – Provide connection to the grounding electrode using G5 acorn ground clamp. Apply an anti-oxidant compound to all mechanical connections.

C Construction

Provide a ground rod assembly driven into the earth at a single point (single point ground). Licensed electrician to install the primary ground rod assembly in an electrical pull box so that the top four inches are accessible for inspection, resistance testing, and maintenance.

D Measurement

The department will measure Equipment Grounding Electrode item by each, 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.0060.044	Equipment Grounding Electrode	EACH

Payment is full compensation for the grounding electrode and all connections.

80. Installing City Furnished Poles Type 31-AL-BD Item SPV.0060.045.

A Description

This special provision describes installing a city-furnished 31 ft. aluminum bolt down light poles. All work shall be according to standard spec 651.

B Materials

B.1.1. Pole

The 31'-0" aluminum pole shaft shall be tapered from the top of the pole to the mounting plate. Dimensions from the pole top to the bracket mounting plate and from the base plate to the top of the pole, as shown on the drawing, shall be rigidly adhered to.

B.1.2.

The base plate shall be cast from either type 319 or 356T6 aluminum. The four elongated mounting holes shall be on 90-degree centers on an 11" bolt circle. The mounting slots shall be sized for 1- inch mounting bolts. The base shall be welded to the shaft so the arms bisect the angle between mounting holes at 45 degrees.

B.1.3.

The poles shall be built as a double bracket unit and supplied with one cover plate per pole.

B.1.4.

The pole cap is to be cast aluminum and be secured to the pole by three equally spaced ¼"-20 hex head stainless steel screws.

B.1.5 Hand Hole and Grounding

The hand hole shall be 4" x 6" nominal. A ¼"-20 NC taped hole and bolt shall be provided in the shaft opposite the hand hole for grounding purposes. The hand hole cover shall be secured to the pole using ¼"-20 NC by ¾" long 18-8 stainless steel button head Torx T27H tamper proof screws. The hand hole is to be 90 degrees from the arms. The center line of the hand hole shall be 14 inches above the mounting plate.

B.1.6 Loading and Stability

The 31'-0" assembly furnished under this specification shall support a fifty-pound fixture of an EPA of 3 on each arm when equipped with a pair of 6' upsweep arms. All pole designs shall meet the latest revision of the AASHTO specifications for these poles as defined in their STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS. The manufacturer shall submit engineering calculations for lighting poles to show that maximum stress and deflections do not exceed specified performance requirements under full design loading, as well as other certified reports and data which indicate that the poles meet all load requirements, within 30 days of the bid award. Engineering calculations shall be prepared and sealed by an engineer licensed in the State of Wisconsin.

The entire horizontal and vertical "wind sail" area of the pole assembly subject to wind load including arm and luminaire shall be designed to withstand the AASHTO standard specifications, from above, for wind load requirements for a 90 MPH wind load with gust factor computed per section 3.8.5 and height and exposure factors from table 3-5.

B.1.7.

All Welding shall be according to the latest applicable A.S.M.E. Standards.

All Welding shall be according to the latest applicable A.S.M.E. Standards.

The manufacturer warrants that the pole supplied will be of merchantable quality will conform to applicable specifications, drawings, designs, samples, or descriptions, will be free from defects in materials and workmanship and will be fit for the particular purpose intended.

B.1.8 Pole Number Plaque

A pole number plaque with high intensity reflective 2" silver numerals on black background as shown on the plans shall be affixed onto the pole shaft.

B.1.9 Riser Cable

Pole is to be wired as shown on the plans. A separate riser cable will be required to be installed inside of pole for each lighting fixture on the pole. The riser cable(s) shall be 40 feet in length and cut from copper 2#12 UF with ground cable. One wire shall be black, the other shall be white, and the ground to be green. All splicing is to be done inside the metal housing. The ground wires shall be spliced inside the metal housing and grounded to the housing and each fixture. The cable shall conform to NEC Article 340. The riser cable shall be continuous without splices. The electrical system in use utilizes a full system ground. The neutral is not to be grounded at any point.

Use an In-Line Fuse Holder assembly on the hot wire that needs to be 600 Volt Rated, and up to 30 Amps, 1-Pole Breakaway, with copper set screw terminals for LOAD, and Wire Size Range #12 to #8 AWG.

Provide a Fast Acting 5 Amp – 250 Volt fuses, from the recommended fuse list from the In-Line Fuse holder manufacturer.

Pickup from Street Lighting Yard

Contractor responsible to contact Street Lighting Shop Yard Contact Person Shop four working days before with the exact number of materials needed. The advance notice will allow the shop to gather the requested items for the contractor to pick up and sign for taking possession of the materials.

The contractor will be responsible for the materials that they take possession of and for the returning any unused materials back to the shop in good condition. If any materials come back damaged or broken the contractor will be responsible for replacing the broken or damaged item.

Street Lighting Shop Yard Contact Person:

Neal Karweik – (414) 286-5943 office / (414) 708-4245 cell All the materials must be picked up all at one time.

The Street Lighting Shop Yard hours for picking up materials is from 8:00 AM to 2:00 PM Monday through Friday.

Contractor must be out of the shop yard by 2:00 PM NO LATER.

C Construction

Install the bolt down pole as specified in the plan and details. After razing the pole use normal pole shaft raking techniques to ensure the centerline of shaft appears vertical to the horizon. Use Anti-Seize Lubricant on all the bolt threads.

D Measurement

The department will measure Installing City Furnished Poles Type 31-AL-BD, by each pole, acceptably completed.

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.0060.045	Installing City Furnished Poles Type 31-AL-BD	EACH

Payment is full compensation for the pole, riser cables, in-line fuse holder assemblies, and all connections.

81. Installing Conduit Into Existing CUC Manhole, Item SPV.0060.046.

A Description

This special provision describes providing new conduit into existing CUC manholes at the locations shown on the plans.

B Materials

Furnish CUC conduit as indicated on contract plans.

C Construction

Maintain any existing conduit paths without interruption or damage. 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 CUC Manhole by each manhole, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.046	Installing Conduit Into Existing CUC Manhole	EACH

Payment is full compensation for drilling holes, removing blocks, removing bricks, and removing abandoned conduit; for providing bricks and coarse aggregate; for excavation, bedding and backfilling, including any sand or other required materials; for providing topsoil, fertilizer, seed, and mulch in disturbed areas; for disposal of surplus materials; and for making inspections.

82. Submersible Multitap 3-Port Pre-Insulated Connector; Item SPV.0060.047.

A Description

This section describes materials, general requirements, personnel qualifications, construction methods, and testing requirements used to perform electrical connections/splices required.

All work shall be according to standard spec 651.

B Materials

Furnish materials conforming to the WSEC, consisting of chapter comm. 16 of the WEC combined with the NEC.

All materials furnished under this contract for street lighting installation are subject to approval by the City of Milwaukee street lighting engineer. A prototype maybe requested for submittal by the engineer with a cable sample installed and spliced for approval prior to field installation.

The contractor shall furnish a complete list of materials to be furnished and used for street lighting. Such list shall include names and addresses of manufactures, together with catalog numbers, certificates of compliance, specifications, and other product information requests by the engineer. The list shall be submitted within 10 calendar days of execution of contract. No material shall be incorporated into the lighting system prior to the written approval of the engineer. Approval does not change the intent of the specifications. The contractor shall not substitute or make changes in material without resubmitting for approval

Use either the Polaris Edge (ISPB2) or Morris Product submersible insulated connector or else an equal connector that is 3 Port Pre-Insulated, that is designed for use in below grade boxes, direct burial, and submersible. The Conductors Range from #2/0 - #14 Rated for 600 Volts Dual Rated for CU. or AL.

C Construction

General Requirements

Work under items related to the street lighting system shall conform to the National Electrical Code (NEC), 2020 Edition, or the latest edition adopted by the State of Wisconsin, Wisconsin Department of Commerce Chapter Comm 16 (Electrical) State of Wisconsin electrical code, City of Milwaukee code, and these special provisions and good electrical practices. The contractor shall not take advantage of lack of details in plans or these specifications where to do so would conflict with the applicable code and standards.

Personnel Qualifications

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

Splices

The contractor shall perform watertight splicing in a pull box. Conductor runs shall be continuous between pole locations, and no splicing of conductors outside the pull box will be allowed. The watertight splices shall reside in the pull box and above the 3 foot wiring coils. The 2#12UF with ground cable (per luminaire) shall be brought to the pole hand hole where it will be spliced with the riser cable to the light fixture. An in-line watertight fuse holder needs to be installed in-line with the hot conductor that leads to the luminaire and should be accessible in pole at the hand hole. Oxide inhibitor (OX4) or equivalent shall be applied on all splice's points.

Contractor is to bundle circuit conductors together and identify circuit at every split point.

Hand hole splices if needed should be completed using a multi-tap connector. The connector should be rated for 600 volts, conductor range #1/0 through #14 AL-CU, have a insulating cover rated at 105 degrees Celsius, and meet or exceed ANSI 119.4 Class A specifications for reliability.

In Service Distribution Systems

The contractor shall not make splices to any underground connections or to any existing distribution system. As indicated on plans, underground splices and connections to existing underground circuitry will be completed by city electricians.

Testing

After the city makes preliminary acceptance of the street lighting system, it shall be monitored by the City of Milwaukee, Street Lighting Electrical Services during a 60-calendar day operational "burn in". Final acceptance of the lighting system will be based on its meeting standard operational criteria as stated in these specifications. The contractor shall be responsible for all necessary repairs and adjustments to the lighting system to meet standard operational criteria.

D Measurement

The department will measure the item Submersible Multitap Pre-Insulated Connectors as each splice location as one unit. The department will measure this item Submersible Multitap Pre- Insulated Connectors by the each (EACH) unit of measure. This covers the Submersible Multitap 3-Port Pre-Insulated Connectors in the pull box.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.047	Submersible Multitap 3-Port Pre-Insulated Connector	EACH

Payment is full compensation for multi-port submersible insulated connectors, anti-oxidant for wire connections to make operational.

83. **Fiberglass/Polymer Concrete Pull Box (13"X 24" X 24"), Item SPV.0060.048.**

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) & (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 approved equal. Cover shall be Tier 15 Rating (15,000 lb Design Load) & (22,500 lb Test Load), bolted cover with logo "Street Lighting" with 2 Penta bolts #CHC1324HL2 color gray as by Highline Products 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 653.3 and City of Milwaukee standards. The pull box shall be installed on 12-inches of No. 2 coarse aggregate fill set flush with grade and backfilled.

D Measurement

The department will measure Fiberglass/Polymer Concrete Pull Box (13"x 24"x 24") 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.0060.048	Fiberglass/Polymer Concrete Pull Box (13"X 24"X 24")	EACH

Payment is full compensation for furnishing and installing the pull boxes.

84. **Remove, Refurbish, and Reinstall Pedestrian Light Poles, Item SPV.0060.049.**

A Description

This special provision describes removing, refurbishing, and reinstalling street lighting units as shown in the plans.

B Materials

The salvaged complete lighting unit includes a pedestal base, pole, luminaire, and hardware. Any new or additional hardware required is incidental to this bid item.

Refurbishment: The contractor is required to completely strip the existing powder coat to a bare metal, powder coat harp pole unit(s) in kind with existing coat and reinstall on concrete base.

Reinstall the complete lighting unit using all street lighting materials salvaged from the project except for the pole wiring. The salvaged complete lighting unit includes a decorative light pole, luminaire, and hardware. Any new or additional hardware required shall be incidental to this bid item.

C Construction

Facilitate the deenergizing of the lighting system in the area of the work with the City of Milwaukee. Remove the street lighting units and place any equipment on blocks so it is not in direct contact with the ground. Where required, store the removed street lighting units, and protect from damage or theft until delivered to the refurbishing contractor.

Removal of any street signs or other items from the street light poles will be completed prior to removal of the street light poles by the contractor.

Disconnect and remove the complete lighting unit from the locations shown in the plans and/or as designated by the engineer. Coordinate delivery to refurbishment contractor and exact paint or powder coat requirements. Any deviation in paint type or color shall be communicated to the engineer or the City of Milwaukee prior to stripping the paint. Completely strip the existing powder coat to a bare metal, repower coat harp pole(s) in kind with existing coat and reinstall on a concrete base.

Reinstall the complete lighting unit in locations shown on the plans or as directed by the engineer.

Reinstall streetlights according to standard spec 657 and standard spec 659.

D Measurement

The department will measure Remove, Refurbish, and Reinstall Pedestrian Light Poles by each individual lighting unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.049	Remove, Refurbish, and Reinstall Pedestrian Light Poles	EACH

Payment is full compensation for coordination, for deenergizing and reenergizing the lighting system, for removal of all existing lighting unit components, stockpiling, cleaning, refurbishment, reinstalling the pole and luminaire, and for disposal of all excess materials.

The department will pay separately for new concrete bases, conduit, and wiring between the poles.

85. Bridge Structural Steel, Item SPV.0085.001.

A Description

This special provision describes furnishing, fabricating, and erecting all new structural steel for bascule span, fixed span, and other miscellaneous steel called on the plans and/or not included under other bid items. The work includes, but is not limited to floorbeams, stringers, lateral bracing, gusset plates, curb weldments, curb plates, rear breaks, center breaks, embedded angles, channels, and plates around concrete opening, steel diamond plates, gutters, gutter support arms, deck drains, downspouts, and all incidentals such as fill plates, connection material and shim packs.

Perform all work according to standard spec sections 506 and 514 except as modified in this special provision.

B Materials

B.1 General

Use new high strength structural steel conforming to ASTM A 709, grade 50. Prior to painting, hot-dip galvanize all new structural steel. All of the requirements in the article, Fracture Control Plan, shall apply.

Utilize galvanized ASTM A325 high strength bolts for fasteners. Forward of a vertical plane passing through the centerline of the main drive pinions, use button-head style high strength, hot-dip galvanized A325 bolts to replicate the look of removed rivets in components on the outboard sides of the bascule girders and in the bottom flanges of the bascule girders. Bolts passing through bascule girder webs shall have their button heads on the outside.

Submit the bolt specification and test report to the engineer according to the standard specifications.

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, provide the size according to the department's 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.

Paint all new structural steel according to Painting Epoxy System Structure, P-40-864.

Furnish materials for the deck drains and downspouts that are according to the plans, standard spec 514.2, and as hereinafter provided.

Steel gutters shall be prefabricated by an approved manufacturer and the material shall conform to ASTM A36. Hot-dip galvanize and paint with the approved two-coat paint system gutters, steel pipes, drainage pans, end closure plates, pipe clamps, fasteners, saddles, and downspouts of the sizes and gauges shown in the plans.

B.1.1 Fracture Control Plan

The AASHTO/AWS Fracture Control Plan (FCP) for Non-redundant Members, (Bridge Welding Code D1.5) shall be followed and shall constitute the Fracture Control Plan for this project, except as modified herein.

All non-redundant fracture critical material noted (FCM) on the plans shall adhere to all requirements of the Fracture Control Plan.

The first sentence of the second paragraph of Subsection 8.2 of the Guide Specifications is amended as follows:

The Charpy test requirements for weld metal connecting AASHTO M270 (ASTM A709) Grades 36, and 50 steels to be 35 ft-lb (47.5 Nm) at -30 °F (-34.4 °C).

Base metal Charpy V-Notch requirements for fracture critical members are as follows:

MATERIAL: AASHTO M270 (ASTM A709)

GRADES	THICKNESS, INCHES	REQUIREMENTS
50*F Up to 4"	Mechanically Fastened	25 ft-lb @ -30 °F
50*F Up to 2"	Welded	25 ft-lb @ -30 °F
50*F Over 2" to 4" incl.	Welded	30 ft-lb @ -30 °F

F- Designates "Fracture Critical" (Zone number is omitted because this specification exceeds Zone 3)

Conduct the CVN-impact testing "P" plate frequency testing according to AASHTO T-243 (ASTM A673). Conduct Charpy impact tests on each plate at each end. Code the Charpy test pieces with respect to heat/plate number and record that code on the mill-test report of the steel supplier with the test result. If requested by the engineer, package and forward the broken pieces from each test (three specimens, six halves) to the Quality Assurance organization of the State.

* Reduce acceptability temperature for the CVN value by 15 °F for each increment of 10 ksi above 65 ksi, if the yield strength of the material exceeds 65 ksi. The yield strength is the value given in the certified "Mill Test Report".

** Reduce acceptability temperature for the CVN value by 15 °F for each increment of 10 ksi above 85 ksi, if the yield strength of the material exceeds 85 ksi. The yield strength is the value given in the certified "Mill Test Report".

C Construction

C.1 General

Perform this work according to section 506.3 except as modified herein or as shown on the plans.

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 parts that have machined surfaces, or 1/16-inch for structural steel connections of parts not having machined surfaces. The plans indicated the nominal or theoretical, thickness "t". Furnish a total shim pack thickness equal to 2 times the nominal thickness indicated. Provide plates of the following material thicknesses: t, t/2, t/4, t/8, t/16, etc. Use the minimum number of plates in the field to achieve the required thickness.

Finishing: Finish any welded assembly that is to be finished after all welding is complete. Anywhere the terms "Fin", "Finish", "Finished", or "Machined", or the finish symbol (\surd) appear on the plans, it means that the surface and faying surface must be machined finished. Hand grinding is not permitted. Install the underdeck gutters according to the details shown on the plans and standard spec 514.3.

C.2 Field Erection of Bascule Span

Erect bascule span steel in such a manner to enable conformance with the requirements for maintaining navigation for this project specified elsewhere.

Obtain permission from the U.S. Coast Guard to close the river to navigation for periods of time sufficient to accomplish work that must be performed in the closed position.

During periods when the bascule leaves are unbalanced, provide positive, sturdy supports, shoring, and/or falsework to support the unbalanced loads as specified in the special provision "Temporary Shoring for Bascule Leaves". Secure the services of a professional engineer licensed in the State of Wisconsin to design these supports to carry 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. Submit proposed shoring methods, sealed by the contractor's engineer, to the engineer for review. However, it remains the contractor's responsibility to ensure that the bascule leaves are adequately shored in a safe manner during all phases of erection construction.

Except as noted elsewhere in these special provisions or as shown on the plans, there will be no separate payment for temporary supports, temporary bracing, or temporary balance material required throughout construction. Include the cost of design, installation and removal of temporary work in the various bid items of the project.

It will be necessary at times to operate the leaves in an unbalanced condition. Submit erection procedures of the proposed construction stages, means of control, and motive power to the engineer for review. However, it remains the contractor's responsibility to ensure that the bascule leaves are opened and closed in a safe manner.

The design of the structure assumes that the structural steel is completely erected before 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 that 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. Perform corrective work at no additional cost to the department.

C.3 Vertical and Horizontal Alignment of Bascule Span

Survey each leaf to verify squareness. In addition, the toes (end floorbeams) of the leaves must be parallel and the proper distance apart. The bascule 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 mounting of the trunnion bearings.

Submit in detail the proposed procedure and sequence for the installation/final alignment of center break, rear break, heel blocks, and span lock to the engineer prior to the start of work.

The first time the bascule leaf 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 on the bascule 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.

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 the engineer's satisfaction. Repair or replace faulty and/or defective work at no additional cost to the department and to the approval of the engineer.

D Measurement

The department will measure Bridge Structural Steel by the pound, acceptably completed. Only new structural steel will be measured for payment.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0085.001	Bridge Structural Steel	LB

Payment is full compensation for furnishing, fabricating and erecting all new bridge structural steel, except for that work noted below that is part of other pay items, in conformance to the plans and this special provision; and for hot-dip galvanizing all new structural steel as specified.

The department will pay separately for:

- Painting new structural steel under the pay item Painting Epoxy System Structure.
- Steel grid floor under the pay item Steel Grid Floor 5-Inch.
- Steel for machinery supports (weldments) in the bascule piers under item "pan Drive Machinery Refurbishment.
- Bascule Girder Stiffener Angle Repairs.
- Loading Girder Base Repairs.
- Bascule Girder Trunnion Web Stiffener Replacements.
- Uplift Column Base Repairs.
- Stiffener Replacement at Pinion Bearing Support.
- Ladder and Railing Repairs.
- Machinery Enclosures.

86. Non-Structural Steel Ballast, Item SPV.0085.002.

A Description

This special provision describes furnishing, cleaning and painting, placing, adjusting/re-adjusting of the non-structural steel ballast plates until counterweight is balanced to the satisfaction of the engineer. The preliminary amount of required non-structural steel ballast plates for balancing and its connection to the existing counterweight is provided on the Contract Plans. Contractor shall verify this information and come up with the final amount of non-structural steel ballast plates required and connection of these plates with the existing counterweight block based on the required bridge balance depending upon the approved shop details and specified herein.

B Materials

Non-structural steel ballast shall be shapes and plates that fit on the front, back or top surfaces of the existing counterweight block.

C Construction

Perform this work according to the applicable provision of standard spec 506, AASHTO LRFD Movable Highway Bridge Design Specifications and pay item "Counterweight Calculations and Span Balancing, Item SPV.0060.019." Before connecting the non-structural steel ballast plates to the counterweight blocks, contractor shall have balancing calculations showing weight and location of these plates required for bascule span balancing.

D Measurement

The department will measure Non-Structural Steel Ballast by the pound acceptably completed. Only new non-structural steel ballast will be measured for payment.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0085.002	Non-Structural Steel Ballast	LB

Payment is full compensation for furnishing, cleaning and painting, and installing non-structural steel ballast.

87. Structural Steel Repair, Field Discovered Conditions Repaired As Directed By Engineer, Item SPV.0085.003.

A Description

This special provision describes removal and reinstallation of existing material as required for access and perform the work under the contract or as directed by the engineer due to unanticipated conditions not otherwise designated for repair or replacement. This item includes all materials, labor and equipment necessary to remove a member or members, design and furnish temporary shoring as required to perform the work and furnish and erect repair/replacement members or portions of members as required to the satisfaction of the engineer.

B Materials

Furnish required steel angles, plates and connection hardware conforming to Section 506 of the Standard Specifications. Use new high strength structural steel conforming to ASTM A 709, grade 50. Fabricate replacement sections of steel angles, plates and fill plates to the satisfaction of the engineer.

C Construction

Perform this work according to the applicable provision of standard spec 506.

Neatly remove deteriorated portions requiring repairs based on the field discovered conditions as directed by the engineer by flame-cutting or sawing. Grind smooth any rough and non-straight edges created by the removal process. Remove any rivets and replace them with high strength bolts in the areas of structural steel to be replaced.

Dispose of removed steel.

After completion of repairs, paint replacement steel elements according to and as part of the bridge repainting work.

D Measurement

The department will measure Structural Steel Repair, Field Discovered Conditions Repaired as Directed by engineer by the pound, acceptably completed. Only new structural steel will be measured for payment.

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.0085.003	Structural Steel Repair, Field Discovered Conditions Repaired As Directed by Engineer	LB

Payment is full compensation removing deteriorated portions of steel members including their connecting rivets; furnishing and installing replacement elements including connecting bolt, welds and fill plates; and for removing and disposing of the existing deteriorated steel part of these repairs.

The department will pay separately for painting of the replacement steel elements under the item Structure Repainting Recycled Abrasive.

88. Two-Line Aluminum Railing, Item SPV.0090.001.

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. Carefully store the material off the ground to ensure proper ventilation and drainage. 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 department. 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 Two-Line Aluminum 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.0090.001	Two-Line Aluminum Railing	LF

Payment is full compensation for fabricating, transporting, and installing the railing, including any repairs.

89. Pedestrian Railing Rehabilitation, Item SPV.0090.002.

A Description

This special provision describes removing the existing pedestrian railing from the bridge and retaining walls, cleaning and painting the railing and posts, and resetting them.

B Materials

Provide replacement hardware and shims conforming to standard spec 513.2 as needed.

C Construction

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

Blast clean the railing and posts per SSPC-SP6 and paint it as described below.

Use a three-coat paint system after cleaning as follows:

- Coat exterior surfaces of railing assemblies and inside of rail elements at field erection joints.
- Coat inside of rail elements at expansion joints.

The color for the finish coating material shall match the color number 27038 (black) according to Federal Standard Number 595.

Set anchor bolts during concrete placement of the concrete fascia girders. Locate to provide the correct railing alignment. Ensure that bolts do not project more than 3/8 inch beyond the nut after attaching the rail. If setting anchor bolts in holes drilled in concrete, use adhesive anchors conforming to standard spec 502.2.12 and installed conforming to standard spec 502.3.14.

In the event that damage does occur to any item that is designated for re-use in the new work, repair or replace the damaged item at no expense to the department. Similarly, if any anchors or concrete areas are damaged during the railing and post removal, replace the damaged anchors and provide required concrete repairs at no expense to the department.

D Measurement

The department will measure Pedestrian Railing Rehabilitation 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.0090.002	Pedestrian Railing Rehabilitation	LF

Payment is full compensation for removing the pedestrian railing and posts; cleaning and painting the railing and posts; and for resetting the pedestrian railing and posts.

90. Traffic Gate Railing, Item SPV.0090.003.

A Description

This special provision describes designing, fabricating, painting and installing new pedestrian railing around and in front of traffic gates according to standard spec 506, 513 and 517 and the plan details, as directed by the engineer, and as hereinafter provided.

B Materials

B.1 Pedestrian Railing

Pedestrian railing shall project above the surface of the sidewalk as shown on the plans along the outside edge of the top of concrete sidewalk on the fixed spans in front of the traffic gate platforms as shown on the plans. Provide gates in the railing at the stairs leading to the bridge piers. Submit shop drawings to the engineer for review.

B.2 Galvanizing and Painting

Use structural steel conforming to standard spec 513. Hot-dip galvanize all new structural steel according to the plans. Furnish a two-coat paint system as specified in standard spec 513.2.3. Color shall match 27038 (black) according to Federal Standard Number 595. Contractor shall submit drawdown to the department prior to painting the railing. Modifications to color may be requested and additional drawdowns of another color provided to the department as needed for acceptance.

B.3 Fasteners

Use high strength, hot-dip galvanized bolts and studs conforming to ASTM A325. Use hot dip galvanized anchor assembly per standard spec 513, except that the whole anchor assembly shall be galvanized.

C (Vacant)

D Measurement

The department will measure Traffic Gate 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.0090.003	Traffic Gate Railing	LF

Payment is full compensation for fabrication, galvanizing, painting, and installing the pedestrian railing around traffic gates, according to the plans, standard specifications, and these special provisions. Included in the work are the posts, railing, base plates, closure details, fill plates, anchor assemblies, and joint material as shown on the plans; hot-dip galvanizing and paint the pedestrian railing according to the plans and special provisions.

91. Marine Dock Fender, Item SPV.0090.004.

A Description

This special provision 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 A14B13C12F19Z1, Z2 and Z3.

Furnish zinc-coated steel nuts, bolts, and washers conforming to ASTM A307 and hot dip 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.

Provide epoxy grouted anchor bolts with nuts and square washer plates of the size, embedment depth and spacing shown on the plans for attaching the new marine EPDM rubber walers to the face of the piers.

C (Vacant)

D Measurement

The department will measure Marine Dock Fender 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.0090.004	Marine Dock Fender	LF

Payment is full compensation for furnishing and installing the rubber fender, locating new anchors to avoid existing anchors, and furnishing and installing treated timber walers.

92. Fence Chain Link Polymer-Coated 10-Ft. P-40-864, Item SPV.0090.005.

A Description

This special provision describes furnishing and installing a new polymer-coated fence system on structures in conforming to the pertinent plan details and as directed by the engineer. The color of all components in this fence system shall be the same and shall be as specified on the plans.

B Materials

All materials for this fence system shall be new stock, free from defects impairing strength, durability, and appearance. Fabric shall be produced by methods recognized as good commercial practice. Wire used in the manufacture of the fabric shall be capable of being woven into fabric without the polymer-coating cracking or peeling. Pipes used in framework shall be straight, true to section and free of defects. All burrs at the ends of pipes shall be removed before galvanizing. The polymer-coating shall be a dense impervious covering, applied without voids, tears or cuts that reveal the substrate. Excessive roughness, bubbles, blisters and flaking in the polymer-coating will be a basis for rejection.

B.1 Fabric

Provide steel chain link fence fabric conforming to the requirements of ASTM F668, Class 2b, a polymer-coating fused and adhered to wire that is zinc-coated. Provide fabric woven from 9-gage wire using plan specified mesh size, diamond pattern, with both the top and bottom selvages knuckled. The minimum breaking strength of the wire shall be 1290 lbs. The color of polymer-coating shall conform to the requirements of ASTM F934.

B.2 Framework

Provide steel rails, posts and post sleeves conforming to the requirements of ASTM F1083, Standard Weight Pipe (Schedule 40) of the size (O.D.) and weight as shown on the plans. The minimum yield strength shall be 30,000 psi and the minimum tensile strength shall be 48,000 psi. These components shall be zinc-coated inside and outside by the hot-dip process as stated in ASTM F1083. Provide polymer-coating over zinc-coating conforming to ASTM F1043. The color of polymer-coating shall conform to the requirements of ASTM F934 and match the color of the other fence components. Weld base plate to posts or post sleeves and complete any additional welding of components before galvanizing.

B.3 Fittings

Provide end post caps, line post caps, top rail sleeves, rail ends, line rail clamps, brace bands, tension bands, tension bars, and tie wires that are steel and conform to the requirements of ASTM F626. Tie wires shall be round and 9-gage wire. These components (excluding tie wires) shall be zinc-coated by the hot-dip process as stated in ASTM F626. Provide polymer-coating over zinc-coating on components (excluding tie wires) that conforms to the requirements of ASTM F626. For tie wires, provide polymer-coating on wire that is zinc-coated using the same procedure as used for the wires in the fence fabric. End post caps and line post caps shall fit tightly over posts to prevent moisture intrusion. Supply dome style caps for end posts and loop type caps for line posts. The color of polymer-coating shall conform to the requirements of ASTM F934 and match the color of the other fence components.

B.4 Bolts

All bolts are to be supplied with lock washers and nuts. Use galvanized steel bolts, nuts and washers per plan details.

B.5 Tests

B.5.1 Fabric and Tie Wire

Breaking Strength: ASTM A370

Zinc-Coating Requirements

Weight of Zinc-Coating: ASTM A90

Polymer-Coating Requirements

Thickness of Polymer-Coating: ASTM F668

Adhesion: ASTM F668

Accelerated Aging Test: ASTM F668, D1499

Mandrel Bend Test: ASTM F668

B.5.2 Framework

Tensile and Yield Strength: ASTM E8
Zinc-Coating Requirements
Weight of Zinc-Coating: ASTM A90
Polymer-Coating Requirements
Thickness of Polymer-Coating: ASTM E376
Adhesion: ASTM F1043
Accelerated Aging Test: ASTM F1043, D1499

B.5.3 Fittings

Zinc-Coating Requirements
Weight of Zinc-Coating: ASTM A90
Polymer-Coating Requirements
Thickness of Polymer-Coating: ASTM F626
Adhesion: ASTM F1043 (same test as for framework)
Accelerated Aging Test: ASTM F1043, D1499 (same test as for framework)

B.6 Submittals

In addition to the engineer, send submittals listed in this section to the name below for informational purposes:

David Nelson
WisDOT (Bureau of Structures)
4822 Madison Yards Way
Madison, WI 53705

B.6.1 Shop Drawings

Submit shop drawings showing the details of fence construction. Show the fence height, post spacing, rail location, and all dimensions necessary for the construction of the chain link fence. Label the end posts, line posts, rails, post sleeves, top rail sleeves, bolts and fittings. State the polymer-coating type used on the fabric, framework and fittings and the Class of coating used on the fabric. State the color of polymer-coating to be used on the fence components. For the fabric, state the wire gage, mesh size, and type of selvages used. For the framework, state the size (O.D.) and unit weight for the posts and rails. For the fittings, state the size for top rail sleeves, brace bands, tension bands, tension bars, line rail clamps, size and type of bolts, and the tie wire gage. State the material type used for fabric, framework, and fittings. Also give the breaking strength for the fabric wire and the tensile and yield strength properties for the framework.

B.6.2 Specification Compliance

Submit certification of compliance with material specifications. Provide material certification and test documentation for fabric, framework, fittings and hardware that shows that all materials meet or exceed the specifications of this contract and the tests in section B5 of this specification. This document shall provide the name, address and phone number of the manufacturer, and the name of a contact person.

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 condition of materials is in conformance with these specifications. If polymer-coating is damaged, contractor shall repair or replace components as necessary to the approval of the engineer at no additional cost to the Owner. Carefully store material off the ground to ensure proper ventilation and drainage and to provide protection against damage caused by ground moisture. Handle all polymer-coated material with care.

C.2 Touch-up and Repair

For minor damage caused by shipping, handling or installation to polymer-coated surfaces, touch-up the finish conforming to the manufacturer's recommendations. Provide touch-up coating such that repairs are not visible from a distance of 6-feet. If damage is beyond repair, the fencing component 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.

C.3 General

Install the chain link fence conforming to ASTM F567 and the manufacturer's instructions. The contractor shall provide staff that is thoroughly familiar with the type of construction involved and materials and techniques specified. Chain link fabric shall be installed on the side of the posts indicated on the plans. Fabric shall be attached to the end posts with tension bars and tension bands. It shall be attached to rails, and posts without tension bands, with tie wires. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Install top rail to pass through line post caps and form a continuous brace between end posts. Minimum length of top rail between splices shall be 20-feet. Splice top rail at joints with sleeves for a rigid connection. Locate splices near 1/4-point of post spacing. Heads of bolts shall be on the side of the fence adjacent to pedestrian traffic.

D Measurement

The department will measure Fence Chain Link Polymer-Coated 10-Ft. 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.0090.005	Fence Chain Link Polymer-Coated 10-Ft. P-40-864	LF

Payment is full compensation for fabricating, galvanizing and polymer-coating all fence components, and transporting to jobsite; and for erecting components to create a polymer-coated fence system, including any touch-up and repairs.

93. Steel Pipe Railing, Item SPV.0090.006.

A Description

This special provision describes removing existing steel pipe railing and designing, fabricating, painting and installing new steel pipe railing in bascule piers according to standard spec 506, 513 and 517 and the plan details, as directed by the engineer, and as hereinafter provided.

B Materials

B.1 Steel Pipe Railing

Steel pipe railing shall project as shown on the plans above the surface of the machinery level floor within the bascule piers as shown on the plans. Submit shop drawings to the engineer for review.

B.2 Galvanizing and Painting

Use structural steel conforming to standard spec 513. Hot-dip galvanize all new structural steel according to the plans. Furnish a two-coat paint system as specified in standard spec 513.2.3. Color shall match 27038 (black) according to Federal Standard Number 595. Contractor shall submit drawdown to the department prior to painting the railing. Modifications to color may be requested and additional drawdowns of another color provided to the department as needed for acceptance.

B.3 Fasteners

Use high strength, hot-dip galvanized bolts and studs conforming to ASTM A325. Use hot dip galvanized anchor assembly per standard spec 513, except that the whole anchor assembly shall be galvanized.

C Construction

Remove the existing steel pipe railing and posts, taking care not to damage the concrete/steel floor at the base of existing railing. If any concrete/steel areas are damaged during the railing and post removal, repair/replace the damaged steel areas and provide required concrete repairs at no expense to the department.

Dispose of removed steel pipe railing.

D Measurement

The department will measure Steel Pipe 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.0090.006	Steel Pipe Railing	LF

Payment is full compensation for removal of existing steel pipe railing and fabrication, galvanizing, painting, and installing the new steel pipe railing in bascule piers, according to the plans, standard specifications, and these special provisions. Included in the work are the posts, railing, base plates, closure details, fill plates, anchor assemblies, and joint material as shown on the plans; hot-dip galvanizing and paint the steel pipe railing according to the plans and special provisions.

94. Urethane Injection Crack Repair, Item SPV.0090.007

A Description

Seal through cracks from the top and bottom of the deck with a hydrophobic polyurethane resin chemical grout, according to standard spec 509, as shown on the plans, as directed by the engineer, and as hereinafter provided.

B Materials

Furnish urethane injection material that expands in the presence of water to form a watertight seal. The injection material shall conform to the following physical properties at 73 degrees F:

	Uncured	Cured
Viscosity, cps	700	---
Specific Gravity, g/cc	1.13 ±0.012	---
Color	Amber	---
Shelf Life (closed containers)	1 year	---
Solids by Weight	100%	---
Tensile Strength	---	29 psi min
Elongation	---	40%
Shear	---	17 psi

Furnish surface seal material for confining the injected urethane 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 mix the urethane and to inject the material into the cracks. The equipment shall be portable and have positive displacement type pumps. Use electric or air powered pumps.

Use injection equipment that has automatic pressure control capable of discharging the material at any present pressure 200-2500 psi (± 5 psi) and is equipped with a manual pressure control override.

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 top and underside of deck at intervals of 4 to 10 inches, or as appropriate to accomplish full penetration of the injection material. Center the injection ports over the cracks as directed by the manufacturer 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 urethane injection material according to the manufacturer's instructions. Use pressures as necessary to fill all voids.

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

D Measurement

The department will measure Urethane Injection Crack Repair by the linear foot, acceptably repaired, measured along the crack.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.007	Urethane Injection Crack Repair	LF

Payment is full compensation for furnishing and placing the sealant, ports and urethane injection; including any cleaning before and after injection.

95. Electrical Cable Type 4#8/1#8 XLP, Item SPV.0090.008.

A Description

This special provision describes furnishing and installing service cable according to current City of Milwaukee Electrical methods and National Electrical Code standards. The service cable shall consist of five cross-linked polyethylene covered, stranded, copper conductors. All work shall be according to standard spec 651.

B Materials

B.1.1.

Unless otherwise specified, the cable to be furnished shall comply with the manufacture and test requirements of the Insulated Cable Engineers Association (ICEA) Specification No. S-61-402, NEMA WC5, latest revision.

B.1.2. Conductors

The conductors shall be of soft round annealed uncoated stranded copper conductor per ASTM B-3, ASTM B-8, and UL Standard UL-44. Conductors No. 8 A.W.G. or larger shall be stranded. Conductors smaller than No. 8 A.W.G. shall be solid unless otherwise specified. Stranding must meet the requirements of ASTM B8, Class B.

Insulation

600V

The insulation for cable rated 600V shall be cross XLPE thermosetting chemically crosslinked polyethylene insulation according to industry standard ICEA Pub. No. S-95-658/Nema WC-70 (2009), latest revision, and shall be a nominal 45 mils. thickness. Insulation shall meet the ANSI/ASTM D2220-74 (latest revision) accelerated water absorption requirements and -30°C (-22°F) cold bend test with a separator applied between the stranded conductor and insulation to facilitate cable stripping. The outside diameter of the insulating covering must be circular and extruded concentrically over the conductor.

Nominal Thickness

The nominal insulation thickness around each individual conductor shall be not less than 90% of the thickness specified in the schedule.

Color Code

The insulation compound which covers each conductor making up a cable shall be color coded in conformance with the N.E.M.A. Color Code Standard, unless otherwise specified; however, printed color designations as in I.3.2 or I.3.3. will not be acceptable under this specification (see schedule). Individual cable will be black, white, red, gray and green.

Marking B.3.1.

Identification for each conductor must be provided by colors according to I.M.S.A. Standards. The outer insulation must be marked with the following information at a minimum: conductor size (AWG), 600V, XLPE, USE-2, manufacturer's name, date of manufacture. All markings must be a minimum of 1/8 inch in height. Marking shall be at approximately 2 foot intervals. A sequential footage marking must be located on the opposite side of the jacket. All marking must be perfectly legible with permanent white ink.

Round Cable B.4.1.

This cable shall consist of stranded, uncoated, conductors each concentrically encased with a cross linked polyethylene USE-2 rubber insulation.

B.4.2. Inspection and Tests

Each length of the individual insulated conductor and completed cable shall comply with all requirements of I.C.E.A. Standards S-61-402. Sampling and Test Methods shall be according to Part 6. A certified report of the tests made on the cable to show compliance with this specification may be required prior to shipment. If requested, a sample of the cable covered by the report shall also be submitted.

POWER, CABLE SCHEDULE FOR SPECIFICATION

	4#8/1#8	
Size of Conductor	#8	#8
Number of Conductors	4	1
Number of Wires in Conductor	7	7
Type of Insulation	4 Cross-Linked Polyethylene (XLPE)	1 Cross-Linked Polyethylene (XLPE)
Insulation Thickness	60 mils	60 mils
Insulation Voltage Rating	600 volt	600 volt
Insulation Color Code	1-black (hot) 1-white (neutral) 1-red (hot) 1-gray (neutral)	1-green (ground)
Non-hydroscopic Fill	None	
Moisture Resisting Sheath		
Jacket Thickness	None	

All conductors shall be uncoated annealed soft copper.

C Construction

The cable shall be installed in HDPE, PVC, and Liquidtight Flexible Non-Metallic conduit when indicated on plans. Any turf damage during installation of cable shall be restored (grass, asphalt or concrete) by the contractor, All splices in luminaires, pull boxes, and transformer bases / hand holes, must be completed by the contractor unless otherwise designated on plans. Do not splice directly in underground or conduit. Do not leave wire or cable ends uncovered or submerged in water. If the engineer observes this condition, the engineer may reject the entire length of cable or wire. Make all electrical connections and splices in the luminaire, pole or transformer base with approved pressure or compression type fittings.

Cover tape with a liberal coating of an electrical varnish or sealant providing flexible protection from oil, moisture, and corrosion. Obtain the engineer's approval of this electrical coating before using. Extend wire for termination 15 inches beyond the pole hand hole. Make all electrical splices in the pull box with pre-approved insulated direct burial and submersible multi-port splice and tap connectors with wire range 2/0 - #14 AWG.

For all cables entering each pull box/vault, provide an extra loop, approximately 3 feet in length, to remain in each pull box/vault. This loop of cable is in addition to the amount needed to reach from the entrance conduit raceway end to the opening in the exiting conduit raceway.

When there is more than one circuit, bundle the circuit conductors with nylon cable ties or engineer approved electrical tape at access points.

At each pull box, identify the line side of each circuit with an attached tag using a fade-resistant waterproof black marker pen and provide the following Info:

Circuit ID: (***Cir.WD-E***)

Line Side coming from unit street light unit is on: (***Street Name***) Side of street light unit is on: (***N,S,E,or W***)

Number of street lighting units from nearest crossing street: (***1,2,3,4,5***) Direction from the nearest crossing street: (***N,S,E,or W***)

Name of the nearest crossing street: (***Street Name***)

Example of Tag Info:

Cir.WD-E,

Line Side from: ***W. Canal St. / N. / 1 / W. /of Potawatomi Cir.***

Install conductors in continuous lengths without splices from termination to termination. The contractor may only splice at pull boxes that connect to light poles by using pre-approved insulated direct burial and submersible multi-port splice and tap connectors with wire range 2/0 - #14 AWG. At locations where no pull box or transformer bases exist, splice at the hand-holes in poles.

D Measurement

The department will measure Electrical Cable Type 4#8/1#8 XLP by the linear feet, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.008	Electrical Cable Type 4#8/1#8 XLP	LF

Payment is full compensation for furnishing, installing, removal of construction debris, and site restoration.

96. Marking Stop Line Epoxy 24-inch, Item SPV.0090.009.

A Description

This special provision describes furnishing and installing Marking Stop Line Epoxy 24-Inch as directed by the engineer, as shown on the drawings and as hereinafter provided.

Perform work under these items according to the requirements of standard spec 646 and the details as shown on the plans, with the exception of the differences noted here within.

B Materials

Furnish epoxy pavement marking and glass bead material according to the standard spec 646.

C Construction

Construction of pavement markings shall be according to manufacturer application and installation procedures, standard spec 646, and the engineer.

All pavement marking areas shall be laid out by the contractor and then reviewed by the engineer. Approval of the marking layout shall be approved by the engineer prior to placement of material.

The contractor shall protect the pavement markings from damage and allow them to fully cure prior to allowing traffic to drive over markings. Any damage shall be corrected by the contractor at the contractor's expense.

D Measurement

The department will measure Marking Stop Line Epoxy 24-Inch by the linear foot, acceptably completed.

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.0090.009	Marking Stop Line Epoxy 24-Inch	LF

Payment is full compensation for preparing the surface, furnishing, and installing all materials and incidentals necessary to complete the work.

97. 2-Duct Conduit, Cement Encased, 4-inch Rigid Nonmetallic Conduit DB-60, Item SPV.0090.010.

A Description

This special provision describes furnishing and installing cement encased multiple duct conduit packages below grade as shown on the plans and as hereinafter described.

B Materials

B.1 Conduit

Furnish and install DB-60 polyvinyl chloride (PVC) conduit. Conduit will be accepted on the basis of a Manufacturer's Certificate of Compliance and WISDOT field inspection upon delivery to a project.

PVC conduit and fittings shall conform to the requirements of Standard Specifications for Smooth-Wall Poly (Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation, ASTM Designation: F512 (latest edition).

B.2 Conduit Spacers

Furnish and install nonmetallic interlocking base spacers and intermediate spacers that provide a 1-1/2" vertical and 1-1/2" horizontal separation between PVC pipes. The base spacers shall provide a 3" vertical separation from the trench bed to the bottom of the PVC pipes.

B.3 Conduit Bed

Furnish and install a minimum 2" conduit bed of stone chips or crushed stone screenings conforming to the following:

3/8 Inch Crushed Stone Chips

Sieve Sizes % Passing by Weight

1/2" 100

3/8" 90-100

No. 8 0-15

No. 30 0-3

Crushed Stone Screenings

Sieve Sizes % Passing by Weight

1/2" 100

No. 4 75-100

No. 100 10-25

B.4 Concrete

The type of concrete mix to be used to encase the ducts will be:

Type I Cement	280 lbs
Fly Ash	100 lbs
Sharp Torpedo Sand	3100 lbs
Water	35 gals
Chryso Air 260 or approved equal	2.0 ozs
Chryso Plast 209 or approved equal	7.0 ozs
Air	5%

Mix the materials to provide an approximate 3 inch slump.

B.5 Slurry Backfill

Aggregate slurry backfill consists of No. 1 concrete aggregate Class 'C' concrete mix with the cement deleted.

Fly Ash (Class C)	75 lbs.
Concrete Sand (Damp)	1830 lbs.
No. 1 Concrete Aggregate	1830 lbs.

Mix the materials with water to inundate the aggregate sufficiently to provide an approximate 3 inch slump. Deposit the mix in the trench directly from a concrete transit mix truck.

B.6 Pull Rope

Pull rope specifications will be:

- Flat construction (7/16" to 5/8" wide)
- 100% woven aramid fiber (may include tracer wire)
- 1500 lbs. Minimum pull strength prelubricated
- sequential footage markings for location

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

C Construction

C.1 Excavation

The excavation shall have the minimum or maximum dimensions shown on the plans and as follows:

Number of Ducts Wide	Minimum (Inches)	Maximum (Inches)
1	8	1/2 11
2	14	5/8 17 1/8
3	20	3/4 23 1/4.
4	26	7/8 29 3/8
5	33	35 1/2
6	39	1/8 41 5/8
7	45	1/4 47 3/4
8	51	3/8 53 7/8

These minimum and maximum trench widths apply to standard 4 inch PVC electrical duct only. When required, the excavation may be widened for the handling and placing of materials.

Sheath and brace open-cut trenches as required by code and as necessary to maintain safety. The cost of furnishing, placing and removing of sheathing and bracing shall be included in the unit bid for the work. The dimensions of the excavation will be governed by the number, configuration and the grade (cover) to which the conduit is to be installed as shown on the plan. The walls of the excavation shall be clean and true.

Prior to excavating trenches, expose the existing manhole and conduit lines. The object of this is to permit adjustments in line and grade to avoid special construction methods. Protect the exposed manhole and conduit from damage.

Lay the conduit at a depth so that sufficient protection from damage is provided. Allowable covers shall be as follows:

The standard cover for mainline conduit is 39 inches and the minimum cover acceptable is 28 inches. Maintain the standard cover wherever possible and any deviation less than the minimum cover requires the approval of the engineer.

Grade the trench to have a minimum pitch of 3 inches per 100 feet. When an obstruction is encountered in the trench and it is necessary to excavate a deeper trench than would otherwise be required, in order to obtain drainage, refer the matter to the engineer to determine whether the extra excavation should be made.

In grading a trench for mainline conduit, there are three general practices for direction of pitch.

(a) When grading a trench in a street with a level grade, the high point of the trench bottom should ordinarily be centered between manholes and pitched downward equally toward each manhole.

(b) Where the street slopes in one direction, locate the high point of the trench bottom approximately 30 feet from the end wall of the higher manhole and grade toward both manholes.

(c) Where a steep grade is encountered, grade the trench at the minimum pitch from the end wall of the higher manhole to a point 20 feet plus or minus toward the lower manhole. From this point, follow the street grade at the standard cover to a point 20 feet plus or minimum away from the end wall of the lower manhole. From this point, the remainder of the section shall be laid at the normal pitch.

After the rough excavation is completed, prepare the bottom of the trench to receive the conduit. Bring the duct bed to the final grade by grading uniformly from the high point to the low or drainage points. Use stone chips or crushed stone screenings to grade the trench. The duct bed shall be a minimum of 2" in depth.

C.2 Placing of Duct

Proceed with placing the ducts as soon as the duct bed has been completed. Inspect all ducts before placing to see that the bores are clean and free from mud, sand, etc. Use only ducts with a smooth bore, free from burrs, rough projections etc. Smooth off burrs or other rough areas likely to damage cable are found in the duct by rasping or scraping.

Place the duct on base spacers with the ends staggered so no two couplings are adjacent. This may be accomplished by the use of the short lengths in stock or cutting back full length sections to the desired lengths. If cut pieces are used, place the cut end at the manhole. Locate the base spacers within 2 feet of the end of each duct and one base spacer located in the middle of the duct.

Use full length pieces for the balance of the conduit line.

Formations of two ducts or more in height are to be carried forward in full formation, that is, as each tier of 20 foot lengths is laid, the next higher tier of ducts shall then be placed on the intermediate spacers. Place these intermediate spacers on top of the base spacers located within two feet from each duct end and one in the middle of each duct. Place the intermediate spacers and ducts for the remaining tiers. Glue each length into the adjoining coupling. A twist and push on the duct being placed will suffice for a water tight joint. Exercise caution in the driving operation, so that neither the coupling nor the duct will be split or damaged in any way. After the full formation has been completed, place wood trench and duct bracing on the ducts to prevent shifting or floating while the concrete envelope is being placed and during driving operation.

This procedure shall be followed with succeeding lengths, providing spacers at the proper intervals, until sufficient trench footage of completed formation has been placed and is ready to receive concrete.

encasement. The terminating point for mainline conduit will be the inside manhole wall. Install a standard end bell fitting flush with the wall on all duct access points.

Install a #10 copper tracer wire along and above the centerline of the duct for encasement in the concrete. The wire shall be 4 feet longer than the run of conduit and be at least 2 feet long at each access point.

Install a pull rope in each run of conduit, as laid. The rope shall be 4 feet longer than the run of conduit and shall be doubled back at least 2 feet at each raceway access point. Anchor the pull rope at each access point in a manner acceptable to the engineer.

C.3 Concreting

Begin concreting after sufficient conduit has been laid and the trench and duct have been inspected. The minimum concrete encasement of the ducts is 3 inches on the top, 2 inches on the sides, and 3 inches on the bottom. After placing, puddle the concrete with a splicing bar or similar tool so that complete duct encasement is accomplished. Remove wood braces used to keep the conduit from floating before the concrete sets completely and the resultant encasement voids filled with concrete. Allow the concrete encasement to set for a minimum of 6 hours before backfilling is commenced.

C.4 Slurry Backfill

Slurry Backfill. Commence backfilling of the conduit immediately after the duct has been inspected, approved and has set to withstand the load.

An aggregate slurry as specified shall be used to backfill the concrete encased conduit. The trench shall be backfilled to the proposed or existing subgrade. The mix shall be deposited in the trench directly from a concrete transit mix truck.

D Measurement

The department will measure 2-Duct Cement Encased, 4-Inch Rigid Non-Metallic Conduit DB-60, furnished and installed at the locations on the plans, will be measured by the linear foot acceptably installed. The measured quantity will equal the linear feet of encased duct, based on the distance along the centerline of duct between ends of conduit. City of Milwaukee shall have final acceptance by the linear feet, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.010.	2-Duct Conduit Cement Encased Rigid Nonmetallic Conduit DB-60	LF

Payment is full compensation for furnishing the conduit, conduit bodies, conduit fittings, conduit spacers, end caps and trace wire; for excavating, bedding, encasement and backfilling including any concrete, stone, aggregate slurry, bracing, or other related materials; for disposing of surplus materials; and for making inspections, and for installing the conduit.

98. Liquidtight Flexible Nonmetallic 1 ½-Inch Conduit, Item SPV.0090.011.

A Description

This special provision describes furnishing and installing Liquidtight flexible nonmetallic conduit for street lighting according to standard spec 652, and as shown in the plan details. All work shall be according to standard spec 651.

B Materials

The Liquidtight flexible nonmetallic conduit shall be Type LFNC-B. The conduit shall be nonconductive, noncorrosive to oil, acid, ozone, and alkaline. The conduit shall have a smooth inner surface with integral reinforcement within the conduit wall.

The flexible nonmetallic conduit shall be UL listed for use as indicated in Article 356 of the latest NEC, and for outdoor use and sunlight resistant.

The fittings and adapters shall be of the same manufacturer as the conduit.

C Construction

Install the fittings, adapters, and conduit in conjunction with street lighting. Install per the manufacturer's instructions and as shown on the plans.

D Measurement

The department will measure Liquidtight Flexible Nonmetallic 1 ½ Inch Conduit per size by the linear foot of conduit installed, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.007	Liquidtight Flexible Nonmetallic 1-1/2-Inch Conduit	LF

Payment is full compensation for furnishing and installing the conduit, including the connectors.

99. Steel Grid Floor 5-Inch, Item SPV.0165.001.

A Description

Perform this work according to the requirements of standard spec 515 except as modified in this special provision.

B Materials

Conform to standard spec 515, except as modified herein or noted on the plans. The grid flooring must conform to the requirements of ASTM A709 Grade 50 and have a minimum copper content of 0.2 percent. Hot-dip galvanize the grid flooring and all connection hardware. Do not paint the grid flooring.

Provide grid flooring consisting of panels fabricated with standard "ribless" main bars 5-3/16 inches deep, spaced on 6 inches on-center with cross bars 1/4-inch by 2 inches at 4-inch spacing. Intersect the cross bars by supplemental bars 1/4-inch by 1 inch evenly spaced between main bars. Interconnect the main beams and cross supplemental by welding according to manufacturer's standards. Provide a grid system having a riding surface comprised of elements that are serrated.

Provide connection plates shop welded to the bottom of the main bearing bars for bolting the grid system to the supporting steel framing system. Provide galvanized form pans and #3 rebar in the deck areas that are to be half filled with concrete. Field welding of the grid system to the supporting steel framing system will not be permitted.

Hot-dip galvanize the shop assembled units of the steel grid floor including grid, connection plates, and all appurtenant items according to ASTM A123 or A153 as applicable. Repair any and all galvanized areas damaged by welding, abrasion, or other causes according to ASTM A780, using either the zinc-based solders or the zinc-rich paints type of materials. Follow the requirements of annexes A1, repair using zinc-based alloys, and/or A2, repair using zinc-rich paints.

Following galvanizing, weigh each grid panel such that the information can be used for accuracy of final bridge balance calculations performed by the contractor. Use an appropriately sized scale accurate to the nearest 10 pounds. Record the scale weights and associated panel piece mark and provide information to the engineer.

Submit a welding sequence and welding procedure for all welds to the engineer for review. Include in the welding sequence the methods to prevent and minimize distortions and residual welding stresses in the completed deck.

C Construction

C.1 Fabrication

Fabricate the grid deck within the following tolerances:

Overall Panel Length and Width: +0 to $-1/8$ -inch maximum from the approved shop drawings.

Panel Squareness: Diagonal lengths between extreme corners of a panel shall measure within $1/4$ -inch from each other.

Panel Flatness: The transverse camber (width) of panel shall be no more than 0.001 times the width of the panel. The longitudinal camber (length) shall be no more than 0.003 times the length of the panel.

Sweep: The side bow (sweep) shall be no more than $\pm 1/4$ -inch per 10 linear feet in either direction.

Main Bar Verticality: The main bar shall be no more than $1/16$ -inch out of vertical on the full bar height.

Cross Bar Verticality: The cross bar shall be no more than $1/16$ -inch out of vertical on the full height.

Main Bar Spacing: Center to center spacing of the main bar shall be no more than $\pm 1/16$ -inch from the detailed bar spacing.

Cross Bar Spacing: Center to center spacing of the cross bar shall be no more than $\pm 1/16$ -inch from the detailed bar spacing.

Fabricate the grid on a level solid surface. Monitor the flatness of the grid panel during the fabrication process. Welding of the grid deck must be sequenced and controlled to prevent distortions during and after fabrication.

C.2 Erection

Connect the grid flooring to the supporting structure by field bolting as shown on the plans. To facilitate the connection, weld attachment plates to the main bearing bars prior to galvanizing, as shown on the plans.

Assemble the grid-flooring units on top of the stringers, with the Main Bearing Bars at right angles to them. Provide units with length sufficient to cover half of the width of the roadway without splicing. Place the grid units, as shown on the erection drawings, and bolted to the stringers as shown on the plans.

Exercise care to place each unit in its proper position, measuring in all cases from the same reference point, to prevent cumulative errors in spacing. Splice the units together along their edges by bolting bars to form a rigid assembly. Field-splice trim and splice bars by bolting. Conform to installation tolerances as noted herein.

Place the fabricated floor grid according to the manufacturer's specifications as approved by the engineer. Splice all transverse bars.

Connect grid assembly to the roadway stringers with field drilled holes in the stringers.

Drill the holes for the bolts in the connection plates of the grid panels in the field to assure proper alignment and fit.

Obtain the engineer's approval prior to any field trimming.

Install the grid deck panels within the following tolerances:

Cross bar alignment between adjacent grid deck panels shall be no more than $\pm 1/16$ -inch

The overall cross bar alignment of grid deck panels from end to end of the bridge leaf shall be no more than $\pm 1/4$ -inch

Support the grid deck in a manner to prevent distortion during transport and storage. Provide adequate support beneath the grid deck panel at the ends of the panel and at intermediate points. Provide intermediate spacing of no more than half the maximum stringer spacing. After transport or storage, conform to the allowable tolerance for flatness as noted above.

Support the grid deck panels in a manner to prevent distortion during handling. Avoid dragging the panels over any obstruction that might damage the components of the grid deck.

Place and install the grid panels such that no initial stress is induced into the grid deck panel. Do not apply external force to the new grid panel, new structure or existing structure to fit the component, except to close a gap of less than $1/16$ inch between the new deck panel and the new stringer. Do not impose undue stresses or distortions of the grid deck during installation. If a gap greater than $1/16$ inch exists between the deck panel and the stringer, provide shims to close the gap. Remove and replace, at no additional cost to the city, any deck panel that is installed with an undue stress or distortion.

Limit the placement of construction equipment on the movable span. Prior to placement of any construction equipment on the bridge structure, submit calculations that determine the capacity of the deck and span. Clearly define the location of the equipment on the work plans. Engage a professional engineer licensed in the State of Wisconsin to prepare the calculations.

D Measurement

The department will measure Steel Grid Floor 5-inch by the square foot, acceptably completed. The department will measure quantities for payment based on the measurement limits 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. 0165.001	Steel Grid Floor 5-Inch	SF

Payment is full compensation for furnishing and erecting the new steel grid floor. The cost of field drilling holes in supporting steel framing and grid connection plates and all associated galvanized bolts, nuts and washers for the bolted attachment of the grid system will be considered included in this payment.

100. Concrete Fill for Grid Deck, Item SPV.0165.002.

A Description

This special provision describes furnishing and placing lightweight concrete masonry for the filled portions of the steel grid bridge deck. Perform the work according to standard spec 501 and 502 except as modified in this special provision.

B Materials

B.1 General

This work requires that portions of the open-grid deck be filled with lightweight concrete masonry having a maximum plastic unit weight of 115 pounds per cubic foot. The lightweight concrete shall have a compressive strength of 3250 psi minimum at 7 days and 4,000 psi at 28 days. The contractor is responsible for the lightweight concrete mix design.

Coarse aggregates shall meet the requirements of Lightweight Coarse Aggregate as specified hereinafter.

Add microsilica admixture to the lightweight concrete to reduce the chloride permeability of the concrete. Microsilica admixture shall meet the requirements as specified in this article.

B.2 Lightweight Coarse Aggregate

Lightweight coarse aggregate shall be expanded clay, shale, or slate produced by the rotary-kiln process and shall meet the requirements of AASHTO M195 and ASTM C330. In case of conflict, AASHTO M195 shall govern. The maximum dry, loose unit weight of the aggregate shall not exceed 55 pounds per cubic foot as tested according to AASHTO T19. If the unit weight of any shipment of lightweight aggregate varies by more than 10 percent from that of the sample submitted for approval, then the shipment may be rejected.

When tested according to AASHTO T104 using magnesium sulfate, the loss of lightweight aggregate in 5 cycles of the accelerated soundness test shall not exceed 8 percent.

The drying shrinkage of concrete specimens prepared and tested according to section 8.4 of AASHTO M195, shall not exceed 0.07 percent.

Furnish samples of coarse aggregate to the engineer for source approval. Take additional samples from shipments at intervals specified by the engineer.

The lightweight aggregate producer shall furnish test reports from an independent testing laboratory certifying that concrete made from the aggregate and containing approximately 6 percent air content shall have a minimum durability factor of 85 percent when tested according to ASTM C666.

The resistance to degradation of the coarse aggregate, when tested according to ASTM C131, shall not exceed 50 percent.

B.3 Microsilica Admixture

Supply the microsilica admixture either in a dry, densified form or as water-based slurry. Submit a notarized manufacturer's certification stating that the microsilica admixture meets the following requirements. Include the solids content in the certification if the microsilica is furnished in slurry.

Silica Dioxide (SiO ₂), min %	85
* Sulfur Trioxide (SO ₃), max %	3
* Loss on Ignition, max %	7
* Other Ingredients, max %	7
Possolanic Activity Index with Portland Cement at 7 days, min % of control	85

*The sum of sulfur trioxide, loss on ignition and other ingredients shall not exceed 15%. The "Other ingredients" include retarder and high-range water reducers, whether included in the admixture or added separately.

B.3 Unit Weight Testing

To obtain a close estimate of the average unit weight of the concrete that will be placed in the steel grid deck for use in span balance calculations, make a trial batch and cast 10 unit weight test blocks from it. Cast unit weight test blocks that measure at least 8" x 8" x 12" and all having the exact same size. Use forms for the test blocks that are rigid and impervious. Provide concrete for the test blocks that contains the same materials and air content as that of the proposed mix design for the concrete to be placed in the steel grid. After the concrete is poured into the test block forms, vibrate it to the same extent it will be vibrated when placed. After vibrating, strike off the tops prior to initial set. Cure the test blocks in their forms for two days with the tops uncovered. During this time, store the blocks under shelter in the open air. After two days, remove the forms and weigh the blocks. Use a scale having an accuracy of 0.01 pound to weigh the blocks. Accurately measure all 3 dimensions and record the weights of the individual blocks, the calculated unit weight of the individual blocks, and the calculated average unit weight of the set of blocks to the nearest 0.01 pounds per cubic foot. Calibrate the scale by weighing a reference object prior to weighing the test blocks. Use the average unit weight obtained from the test blocks in the span balance computations.

C Construction

To prove the design meets the given criteria, provide the engineer with the mix design, test results including plastic unit weight, and 6 test cylinders cured a minimum of 7 days, at least 30 days prior to the anticipated grid deck pour.

Monitor air content using the volumetric method.

Delay the pour if the temperature within 48 hours following the proposed pour is predicted to fall below 40° F or exceed 100° F.

Give the concrete a continuous wet cure for a period of 7 days. Use the continuous wet cure method for curing. The use of impervious curing covers which do not require wetting will not be permitted. Supply sufficient water needed to keep the blankets saturated for the required curing period. Provide concrete having a 28 day compressive strength of 4,000 psi. A bascule leaf with a completed concrete fill pour may be operated once the concrete has attained a compressive strength of 3000 psi. A completed bridge deck may be subject to vehicular traffic upon attainment of 3000 psi compressive strength, but no sooner than after seven curing days have passed.

D Measurement

The department will measure Concrete Fill for Grid Deck by the square foot, acceptably completed. The department will measure quantities for payment based on the measurement limits 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.0165.002	Concrete Fill for Grid Deck	SF

Payment is full compensation for furnishing, placing and curing concrete fill.

101. Fiberglass Sidewalk Floor Plates, Item SPV.0165.003.

A Description

This special provision describes furnishing and installing fiberglass floor plate for the sidewalks and the centerlock maintenance platforms on the bascule leaves.

B Materials

B.1 General

The minimum requirements for fiberglass sidewalk plates, splice bars, and stainless steel hardware shall be as follow:

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 conform in strength, quality and workmanship to that typically provided by the practice indicated in this specification.

Floor Plate composition shall consist of a glass fiber reinforced polyester resin matrix, approximately 50% glass by weight. A synthetic surface veil shall be the outermost layer covering the exterior surfaces. Glass strand rovings shall be used internally for longitudinal strength. Continuous strand glass mats or stitched reinforcements shall be used internally for transverse strength.

The fiberglass sidewalk floor plates shall be manufactured by the pultrusion process and made from isophthalic polyester resin with fire retardant additives to meet a flame spread rating of less than 25 per ASTM E-84 and meet the self-extinguishing requirements of ASTM D-635. All structural shapes shall contain a UV inhibitor.

B.2 Properties

The fiberglass sidewalk floor plates shall have the following properties:

Color:	Haze Gray Similar to FS36280
Resin:	Isophthalic Polyester
Fire Retardant Properties:	Meets Class I Frame Rating of 25 or less per ASTM E-84
Anti-Skid Surface:	Permanently bonded grit baked epoxy surface

Fiberglass sidewalk floor plates shall have a gray-ultra-violet resistant polyurethane top coat.

B.3 Minimum Ultimate Coupon Properties

Fiberglass sidewalk floor plates shall meet the following test results for the ultimate coupon properties per the referenced ASTM procedures:

Mechanical Property	Test	Value
Flexural stress, Flatwise LW	D790	24,000 psi
Flexural stress, Flatwise CW	D790	17,000 psi
Flexural Modulus, Flatwise LW	D790	2,000,000 psi
Flexural Modulus, Flatwise CW	D790	1,400,000 psi
Tensile Stress, LW	D638	24,000 psi
Tensile Stress, CW	D638	10,000 psi
Tensile Modulus, LW	D638	2,000,000 psi
Tensile Modulus, CW	D638	1,400,000 psi
Compressive Stress, Edgewise, LW	D695	24,000 psi
Compressive Stress, Edgewise, CW	D695	20,000 psi
Compressive Modulus, Edgewise, LW	D695	1,800,000 psi
Compressive Modulus, Edgewise, CW	D695	1,000,000 psi
Notched Izod Impact, LW	D256	20 ft-lbs/in
Notched Izod Impact, CW	D256	5 ft-lbs/in
Bearing Stress, LW	D953	32,000 psi
Bearing Stress, CW	D953	32,000 psi
Perpendicular Shear Stress, LW	D3946	6,000 psi
Perpendicular Shear Stress, CW	D3946	6,000 psi
Poisson's Ratio, LW		0.31 in/in
Poisson's Ratio, CW		0.29 in/in
Physical Property	Test	Value
Barcol Hardness	D-2583	40
24 Hr. Water Absorption	D570	0.6% Max.
Density	D792	0.062-0.070 lbs/i
Coefficient of Thermal Expansion	D696	8.0x10 ⁶ in/in/ F
Electrical Property	Test	Value
Arc Resistance	D495	120 seconds
Dielectric Strength, PF	D149	N.T.
Dielectric Strength, LW	D149	35 KV/ in

The following abbreviations pertain to the information on the above properties:

LW = lengthwise

CW = crosswise

PF = perpendicular to the laminate face

N.T. = not tested

Submit a sample of the sidewalk plate for to the engineer for review along with the shop drawing submittal.

Provide countersunk stainless steel bolts for attaching fiberglass plates to supporting structural steel members and for attaching fiberglass surface plates to underlying splice plates at butt joints as shown in the plans.

C Construction

Drill all the holes connecting the plates to the 5-inch fiberglass splice plate in the shop and all other holes in the field.

Furnish sufficient fiberglass patch kits to patch all holes and cuts made in the field.

Supply stainless steel bolts, washers and nuts, and fiberglass support bars 5 inches wide. These support bars should have the longitudinal fibers in the 5 inches wide direction. The main bars should be placed in the longitudinal direction of the span for the sidewalk plates.

Stainless steel 1/2-inch diameter countersunk head screws, 1/2-inch nylon plug type key lock nuts, 1/2-inch washers and beveled washers shall be Ryerson and AISI Stainless Steel 304, or an approved equal.

Fiberglass plate shall be anti-skid abrasive grit with a surface buildup equal to 3550 mesh silica, as manufactured by Joseph T. Ryerson and Son, Inc., IKG Industries, or an approved equal. The 5" fiberglass splice plate does not require an anti-skid surface.

Fiberglass plates that do not meet the requirements set forth by these specifications and the plans shall be returned for a product that will receive the ultimate inspection and approval by the department.

Drilled holes in fiberglass 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.

Fasteners for the non-metallic sidewalk plates shall comply standard spec 513.2.

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., IKG Industries, or an approved equal.

Predrill at the shop before delivery all holes where the plates are attached to adjacent plates and 5" splice plates. The splice plates shall be drilled in order that the smooth surface is up against the bottom of the walk plates.

Provide a qualified person to instruct the crews in the type of tools to use and proper methods to install and fabricate the fiberglass plates. Provide a minimum of 24 hours of on-the job instruction oversight of work by crews.

D Measurement

The department will measure Fiberglass Sidewalk Floor Plates by the square foot, acceptably completed. The department will deduct the area of the centerlock access hatch in the sidewalk.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.003	Fiberglass Sidewalk Floor Plates	SF

Payment is full compensation for furnishing, fabricating and installing fiberglass sidewalk floor plate according to the plans.

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 15 (number) TrANS Graduate(s) be utilized on this contract.
- 2) **On-the-Job Training, Item ASP.1T0A, ASP 1 Apprentice.** At the rate of \$5.00 per hour on federal aid projects at the point when an employee who came out of the TrANS Program is subsequently entered into an apprenticeship contract in an underutilized skilled trade (this will include the Skilled Laborer Apprenticeship when that standard is implemented).

Eligibility and Duration: To the employing contractor, for the length of time the TrANS graduate is in apprentice status.

Contract Goal: To maintain the intent of the Equal Employment Opportunity program, it is a goal that 6 (number) TrANS Apprentice(s) be utilized on this contract.
- 3) The maximum duration of reimbursement is two years as a TrANS graduate plus time in apprentice status.

- 4) If a TrANS program is not available in the contractor's area and another training program is utilized, payment of On-the-Job Training hours may be approved by the Wisconsin Department of Transportation (WisDOT) if the training program meets the established acceptance criteria. Only On-the-Job Training Hours accumulated after WisDOT approval will be reimbursed as specified under Items ASP.1T0G and ASP.1T0A. For more information, contact the Disadvantaged Business Enterprise Office at the phone numbers listed above.
- 5) WisDOT reserves the right to deny payments under items ASP.1T0G and ASP.1T0A if the contractor either fails to provide training or there is evidence of a lack of good faith in meeting the requirements of this training special provision.

II. 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.

III. IMPLEMENTATION

The implementation of ASP 1 is intended to cover only the amount of time it takes for underutilization to be resolved across the trades. This will be measured annually at the county and/or state levels using data administered by WisDWD in relation to goals set by the USDOL-OFCCP. With appropriate state and federal approvals, we may also do some measurement at the company level.

It is the contractor's responsibility to note on their Certified Payrolls if their employee is a TrANS graduate or a TrANS apprentice. The District EEO Coordinators utilize the information on the Certified Payrolls to track the hours accumulated by TrANS Graduates and TrANS apprentices on WisDOT contracts. Payment under this ASP 1 is made based on the hours recorded off of the Certified Payrolls. Tracking may eventually include improved linkages with the WisDWD apprentice database, information from company and committee level sources.

TrANS is nondiscriminatory by regulation, and is a tool for optional use by contractors to address the underutilization of women and minorities as laborers and apprentices in our industry's skilled trades.

IV. TRANS TRAINING

As part of the contractor's equal employment opportunity affirmative action program, training shall be provided to employees enrolled in apprenticeship and on-the-job training programs as follows:

The contractor shall provide on-the-job training aimed at developing full journey workers in the type of trade or job classifications involved. In the event the contractor subcontracts a portion of the contract work, the contractor shall determine how many, if any, of the trainees are to be trained by the subcontractor provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract.

Training and upgrading of minorities and women toward journey workers status is a primary objective of this training special provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority trainees and women trainees); to the extent such persons are available within a reasonable area of recruitment. The contractor will be given an opportunity and will be responsible for demonstrating the steps that they have taken in pursuance thereof, prior to determination as to whether the contractor is in compliance with this training special provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journey workers status or in which they have been employed as a journey worker. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the contractor's records should document the findings in each case.

V. APPRENTICESHIP TRAINING

The Federal Highway Administration's (FHWA) policy is to require full use of all available training and skill improvement opportunities to assure increased participation of minority groups,

disadvantaged persons and women in all phases of the highway construction industry. The FHWA On-the-Job Training (OJT) Program requires the State transportation agencies (STAs) to establish apprenticeships and training programs targeted to move women, minorities, and disadvantaged individuals into journey-level positions to ensure that a competent workforce is available to meet highway construction hiring needs, and to address the historical under-representation of members of these groups in highway construction skilled crafts.

The OJT Supportive Services (OJT/SS) Program was established in Title 23 Code of Federal Regulations (CFR), Part 230) to supplement the OJT program and support STA training programs by providing services to highway construction contractors and assistance to highway construction apprentices and trainees. The primary objectives of OJT/SS are:

- (1) To increase the overall effectiveness of the State highway agencies' approved training programs.
- (2) To seek other ways to increase the training opportunities for women, minorities, and disadvantaged individuals.

The STAs are responsible for establishing procedures, subject to the availability of Surface Transportation and Bridge Funds under 23 U.S.C. §140(b) (Nondiscrimination), for the provision of supportive services with respect to training programs approved under 23 CFR, Part 230(a) (Equal Employment Opportunity on Federal and Federal-aid Construction Contracts – including Supportive Services).

The contractor and subcontractor shall maintain records to demonstrate compliance with these apprenticeship requirements. Reasonable exemptions and modifications to and from any or all of these requirements will be determined by the Wisconsin Department of Transportation-Civil Rights Office. A request for an exemption or modification, with justification, shall be made in writing, addressed to WisDOT Civil Rights Office, 4802 Sheboygan Avenue, P.O. Box 7965, Rm. 451, Madison, WI 53707.

ADDITIONAL SPECIAL PROVISION 3

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM IMPLEMENTATION

Authority

Wisconsin Department of Transportation (WisDOT) is a recipient of funds from the US Department of Transportation's Federal Highway Administration. The DBE program is a federal program applicable on all contracts administered by WisDOT that include federal-aid highway funds. The authority for the DBE program is the Transportation Bill as approved by Congress periodically. DBE program guidance and requirements are outlined in the Code of Federal Regulations at 49 CFR Part 26. This contract is subject to DBE provisions because it is financed with federal-aid-highway funds. Additionally, this contract is subject to the *State of Wisconsin Standard Specifications for Highway and Structure Construction* and all applicable contract documents.

Requirements

Pursuant to the federal DBE program regulation at 49 CFR Part 26, a contractor's failure to comply with any provision of the DBE program regulatory provisions will be considered a material breach of contract. This is nonnegotiable.

If a contractor fails to carry out the DBE program requirements and/or the Required Contract Provisions for Federal Aid Contracts (FHWA 1273) referenced in this document, sanctions will be assessed depending upon the facts, reasoning, severity, and remedial efforts of the contractor that may include: termination of contract, withholding payment, assessment of monetary sanctions, and/or suspension/debarment proceedings that could result in the disqualification of the contractor from bidding for a designated period of time.

- (1) The Commitment to Subcontract to DBE (Form DT1506 or digital submittal), Attachments A, and Good Faith Effort Documentation (Form DT1202) will be submitted as described in Section 2.
- (2) Any change to DBE Commitments thereafter must follow modification of DBE subcontracting commitment as described in Section 9.
- (3) The Department requires this list of DBE subcontractors from all bidders at time of bid to ensure the lowest possible cost to taxpayers and fairness to other bidders and subcontractors. Bid shopping is prohibited.
- (4) The contractor must utilize the specific DBE firms listed in the approved DBE Commitment to perform the work and/or supply the materials for which the DBE firm is listed unless the contractor obtains written consent in advance from WisDOT. The contractor will not be entitled to payment for any work or materials on the approved DBE Commitment that is not performed or supplied by the listed DBE without WisDOT's written consent.

Description

The Wisconsin Department of Transportation is committed to the compliant administration of the DBE Program. The DBE provisions work in tandem with FHWA 1273 and WisDOT's *Standard Specifications for Highway and Structure Construction* and *Construction and Materials Manual*. The WisDOT Secretary is signatory to assurances of department-wide compliance.

The Department assigns the contract DBE goal as a percentage of work items that could be performed by certified DBE firms on the contract. The assigned DBE goal is expressed on the bid proposal as a percentage applicable to the total contract bid amount.

- (1) WisDOT 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 contract DBE goal by subcontracting work to a DBE firm or by procuring services or materials from a DBE firm.

- (2) Under the contract, the prime contractor should inform, advise, and develop participating DBE firms to be more knowledgeable contractors who are prepared to successfully complete their contractual agreement through the proactive provision of assistance in the following areas:
- Produce accurate and complete quotes
 - Understand highway plans applicable to their work
 - Understand specifications and contract requirements applicable to their work
 - Understand contracting reporting requirements
- (3) The Department encourages contractors to assist DBE subcontractors more formally by participating in WisDOT's Business Development program as a mentor, coach, or resource. For comprehensive information on the Disadvantaged Business Enterprise Program, visit the Department's Civil Rights and Compliance Section website at: <http://wisconsindot.gov/Pages/doing-bus/civil-rights/dbe/default.aspx>

1. Definitions

Interpret these terms, used throughout this additional special provision, as follows:

- a. **Assigned DBE Contract Goal:** The percentage shown on the cover of the Highway Work Proposal that represents the feasible level of DBE participation for each contract. The goal is calculated using the Engineer's Estimate and DBE Interest Report. Goal assignment includes review of FHWA funds, analyzes bid items for subcontract opportunity and compatibility with DBE certified firm work codes. Additional factors considered include proximity, proportion, and regulations.
- b. **Bid Shopping:** In construction law, bid shopping is the practice of divulging a subcontractor's bid to another prospective contractor(s) before or after the award of a contract to secure a lower bid.
- c. **DBE:** Disadvantaged Business Enterprise – A for-profit small business concern where socially and economically disadvantaged individuals own at least a 51% interest and control management and daily business operations.
- d. **DBE Commitment:** The DBE Commitment is identified in the Commitment to Subcontract to DBE (Form DT1506) and is expressed as the amount of DBE participation the prime contractor has secured. The DT1506, a contract document completed by the bidder, is required to be considered a responsive bidder on an FHWA-funded contract that has an assigned DBE goal. The prime contractor will have the option to submit the DT1506 digitally, as an entry with the bid in Bid Express, or as an attachment to the bid.
- e. **DBE Utilization:** The actual participation of a DBE subcontractor on a project. WisDOT verifies DBE utilization through review of the DBE Commitment, payments to subcontractors, and contract documentation. The Prime Contractor receives DBE credit for payments made to the DBE firms performing the work listed on the approved DBE Commitment, and those submitted after approved commitment with Attachment A.
- f. **Good Faith Effort:** Legal term describing a diligent and honest effort taken by a reasonable person under the same set of facts or circumstances. For DBE subcontracting, the bidder must show that it took all necessary and reasonable steps to achieve the assigned DBE goal by the scope, intensity, and appropriateness of effort that could reasonably be expected for a contractor to obtain sufficient DBE participation.
- g. **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.
- h. **Reasonable Price:** Contractors are expected to assess reasonable price by analyzing the contract scope for DBE subcontract feasibility and comparing common line items in DBE and non-DBE subcontract quotes for the same work. Per federal regulation, reasonable price is not necessarily the lowest price.
- i. **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.
- j. **Tied quote:** Subcontractor quote that groups multiple bid/line items at a bundled/package price with a notation that the items within the quote will not be separated.

2. WisDOT DBE Program Compliance

a. Documentation Submittal

- The Commitment to Subcontract to DBE (Form DT1506 or digital submittal) must be submitted at the time of bid (Tuesday) by all prime contractors.
- Attachments A OR quotes from all DBEs included in the Commitment must be submitted at bid (Tuesday) **OR**
- Within one-hour following bid submittal by ALL prime contractors via eSubmit (Tuesday).
- If only DBE quotes were submitted, all remaining signed Attachments A must be submitted within 24-hours of bid closing via eSubmit (Wednesday).
- If the assigned DBE contract goal is not met, Documentation of Good Faith Effort (Form DT1202) and supporting documentation must be submitted within 24-hours of bid closing (Wednesday) via eSubmit. [Instructions for eSubmit.](#)

**Bidders have the option of submitting the DBE Commitment at the time of bid via direct entry through Bid Express OR with attachment of Form DT1506 (Commitment to Subcontract to DBE). The DBE Commitment entered with bid is the digital form of the DT1506. Separate submission of Form DT1506 is not required if the DBE Commitment is entered in Bid Express. Form DT1202, if applicable, is no longer required to be submitted at time of bid; submit DT1202 within the 24-hour supplemental time frame following bid closing.

The DBE Office will not certify Good Faith Effort and the Bureau of Project Development will consider the bid nonresponsive if the contractor fails to furnish the DBE Commitment (digitally entered into the bid OR Form DT1506 as an attachment), Attachments A, and Form DT1202 if applicable, as required. See sample forms in the Appendix.

b. Verification of DBE Commitment

The documentation related to DBE subcontract commitment submitted prior to contract award is evaluated as follows:

(1) DBE Goal Met

If the bidder indicates that the contract DBE goal is met, the Department will evaluate the DBE Commitment submitted with bid OR Form DT1506, and Attachments A to verify the actual DBE percentage calculation. If the DBE Commitment is verified, the contract is eligible for award with respect to the DBE Commitment.

(2) DBE Goal Not Met

- a) If the bidder indicates a bid percentage on the DBE Commitment that does not meet the assigned DBE contract goal, the bidder must request alternative evaluation of good faith effort through submission of Form DT1202 (Documentation of Good Faith Effort) within 24-hours of bid including narrative description. Supplementary documentation of good faith effort that supports the DT1202 submission is also due within 24-hours of bid submission and prior to bid posting. The Department will review the bidder's DBE Commitment and evaluate the bidder's good faith efforts submission.
- b) Following evaluation of the bidder's Good Faith Effort documentation the bidder will be notified that the Department intends to:
 1. *Approve* the request (adequate documentation of GFE has been submitted) - no conditions placed on the contract with respect to the DBE Commitment;
 2. *Deny* the request (inadequate documentation of GFE has been submitted) - the contract is viewed as non-responsive per Wisconsin Standard Specifications for Highway and Structure Construction and will not be executed.

- c) If the Department denies the bidder's request, the contract is ineligible for award. The Department will provide a written explanation for denying the request to the bidder. The bidder may appeal the Department's denial (see Section 4).

Supplemental good faith effort documentation must be submitted through eSubmit.

3. Department's Criteria for Good Faith Effort Documentation

The Federal-aid Construction Contract Provision, referenced as FHWA-1273, explicitly states that the prime contractor shall be responsible for all work performed on the contract by piecework, station work, or subcontract.

The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of the contract including assurances of equal employment opportunity laws, DBE regulations, and affirmative action. Compliance encompasses responsible and responsive action, documentation, and good faith effort.

Contractually, all contractors, subcontractors, and service providers on the contract are bound by FHWA 1273 and DBE program provisions. **Prime contractors should encourage subcontractors to utilize DBE firms whenever possible to contribute to the assigned DBE contract goal.**

Bidders are required to document good faith effort. Per 49 CFR Part 26.53, good faith effort is demonstrated in one of two ways. The bidder:

- (1) Documents that it has obtained enough DBE participation to meet the goal; OR
- (2) Documents that it made adequate good faith efforts to meet the goal, even though it did not succeed

Appendix A of 49 CFR Part 26 provides guidance concerning good faith efforts. WisDOT evaluates good faith effort on a contract basis just as each contract award is evaluated individually.

The efforts employed by the bidder should be those that WisDOT can reasonably expect a bidder to take to actively and aggressively obtain DBE participation sufficient to meet the DBE contract goal. The Department will only approve demonstration of good faith effort if the bidder documents the quality, quantity, and intensity of the variety of activities undertaken that are commensurate with expected efforts to meet the stated goal.

The Department, in conjunction with industry stakeholders, has developed the following guidance for contractor good faith effort activity. 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.

a. Solicitation Guidance for Prime Contractors:

- (1) Document all efforts and decisions made toward achieving the DBE goal on the contract. The bidder should use WisDOT-approved DBE outreach tools, including the UCP DBE Directory and the Bid Express Small Business Network to foster DBE participation on all applicable contracts.
- (2) As needed, 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. Phone numbers are (414) 438-4584 and/or (608) 267-3849; Fax: (414) 438-5392; E-mail: DBE_Alert@dot.wi.gov
- (3) Participate in and document a substantive conversation with at least one DBE firm per Let, to discuss questions, concerns, and any other contract related matters that may be applicable to the DBE firm. Guidelines for this conversation are provided in Appendix A of ASP-3.
- (4) Request quotes by identifying potential items to subcontract and solicit. In their initial contacts, contractors are strongly encouraged to include a single page, 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 B.* 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 firms 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 quotes are being sought to DBE_Alert@dot.wi.gov
- ii. Acceptable outreach tools include SBN (Small Business Network, see Appendix C): <https://www.bidx.com/wi/main>, postal mail, email, fax, and phone.
 - a. Contractors must ask DBE firms for a response in their solicitations. See *Sample Contractor Solicitation Letter*, Appendix B. This letter may be included as an attachment to the sub-quote request.
 - b. Solicit quotes at least 10 calendar days prior to the letting date 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. A follow up solicitation should take place within 5 calendar days of the letting date. Email and/or SBN are the preferred method for the 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 record of subcontractor outreach effort

b. Guidance for Evaluating DBE quotes

- (1) Quote evaluation practices required to evaluate DBE quotes:
 - i. Reasonable Price: Contractors are expected to assess reasonable price by analyzing the contract scope for DBE subcontract feasibility and comparing common line items in DBE and non-DBE subcontract quotes for the same work. Per federal regulation, reasonable price is not necessarily the lowest price. See 49 CFR Part 26, Appendix A. IV.D(2).
- (2) Documentation submitted by the prime of the following evaluation is required to evaluate DBE quotes by contractors:
 - i. Evaluation of DBE firm's ability to perform "possible items to subcontract" using legitimate reasons, including but not limited to, **a discussion** between the prime and DBE firm regarding its capabilities prior to the bid letting. If lack of capacity is the reason for not utilizing the DBE firm's quote, the prime is 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 indicated by the NAICS code(s) listed in the UCP directory can be counted toward DBE credit. Documentation of the conversation is required.
 - a. In striving to meet an assigned DBE contract goal, contractors are expected to use DBE quotes that are responsive and reasonable. This includes DBE quotes that are not the low quote.
 - b. Additional evaluation - Evaluation of DBE quotes with tied bid items. Typically, this type of quoting represents a cost saving but is not clearly stated as a discount. Tied quotes are usually presented as an 'all or none' quote. When non-DBE subcontractors submit tied bid items in their quotes, the DBE firm's quote may not appear 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.

See Appendix D – *Good Faith Effort Evaluation Measures* and Appendix E - *Good Faith Effort Best Practices*.

c. Requesting Good Faith Effort Evaluation At the time of bid- if the DBE goal is not met in full, the prime contractor must indicate they will file form DT1202- Documentation of Good Faith Effort within 24-hours of bid submission. Supplementary documentation of good faith effort that supports the DT1202 submission is also due within 24-hours of bid submission and prior to bid posting. Supporting documentation for the DT1202 is to include the following:

- (1) Solicitation Documentation: The names, addresses, email addresses, and telephone numbers of DBE firms contacted along with the dates of both initial and follow-up contact; electronic copies of all written solicitations to DBE firms. A printed copy of SBN solicitation is acceptable.
- (2) Selected Work Items Documentation: Identify economically feasible work units to be performed by DBEs to include activities such as: list of work items to be performed; breaking up of large work items into smaller tasks or quantities; flexible time frames for performance and delivery schedules.
- (3) Documentation of Project Information provided to interested DBEs: A description of information provided to the DBE firms regarding the plans, specifications, and estimated quantities for portions of the work to be performed by that DBE firm.
- (4) Documentation of Negotiation with Interested DBEs: Provide sufficient evidence to demonstrate that good faith negotiations took place. Merely sending out solicitations requesting bids from DBEs does not constitute sufficient good faith efforts.
- (5) Documentation of Sound Reasoning for Rejecting DBEs and copies of each quote received from a DBE firm and, if rejected, copies of quotes from non-DBEs for same items.
- (6) Documentation of Assistance to Interested DBEs- Bonding, Credit, Insurance, Equipment, Supplies/Materials
- (7) Documentation of outreach to Minority, Women, and Community Organizations and other DBE Business Development Support: Contact organizations and agencies for assistance in contacting, recruiting, and providing support to DBE subcontractors, suppliers, manufacturers, and truckers at least 14 days before bid opening. Participate in or host activities such as networking events, mentor-protégé programs, small business development workshops, and others consistent with DBE support.

If the Good Faith Effort documentation is deemed adequate, the request will be approved and the DBE office will promptly notify the Prime Contractor and Bureau of Project Development.

If the DBE Office denies the request, the Prime Contractor will receive written correspondence outlining the reasons. The Department encourages the Prime Contractor to communicate with DBE staff to clarify any questions related to meeting goals and/or contractor demonstration of good faith efforts.

If the contract is awarded, the Prime Contractor must obtain written consent from the DBE Office to change or replace any DBE firm listed on the approved DBE Commitment. No contractor, prime or subsequent tier, shall be paid for completing work assigned to a DBE subcontractor on an approved DBE Commitment unless WisDOT has granted permission for the reduction, replacement, or termination of the assigned DBE in writing. If a prime contractor or a subcontractor on any tier uses its own forces to perform work assigned to a DBE on an approved DBE Commitment, **they will not be paid for the work**. Any changes to DBE Commitment after the approval of the DBE Commitment must be reviewed and approved by the DBE Office prior to the change (see Section 9).

Additional resources for demonstrating and tracking good faith effort can be found on the “Contracting with a DBE” webpage in the [ASP-3 and Good Faith Effort Guidance](#) section.

4. Bidder's Documentation of Good Faith Effort Evaluation Request Appeal Process

A bidder can appeal the Department's decision to deny the bidder's demonstration of Good Faith Effort through Administrative Reconsideration. The bidder must provide a written justification refuting the specific reasons for denial as stated in the Department's denial notice. The bidder may meet in person with the Department if so requested. Failure to appeal within 5 business days after receiving the Department's written notice denying the request constitutes a forfeiture of the bidder's right of appeal. Receipt of appeal is confirmed by email date stamp or certified mail signed by WisDOT staff. A contract will not be executed without documentation that the DBE provisions have been fulfilled.

The Department will appoint a representative who did not participate in the original good faith effort determination, to assess the bidder's appeal. The Department will issue a written decision within 5 business days after the bidder presents all written and oral information. In that written decision, the Department will explain the basis for finding that the bidder did or did not demonstrate an adequate good faith effort to meet the contract DBE goal. The Department's decision is final.

5. Determining DBE Eligibility

Directory of DBE firms

- a. The only resource for DBE firms certified in the State of Wisconsin is the Wisconsin Unified Certification Program (UCP) DBE Directory. WisDOT maintains a current list of certified DBE firms at: <http://wisconsindot.gov/Documents/doing-bus/civil-rights/dbe/dbe-ucp-directory.xlsx>
- b. The DBE Program office is available to assist with contracting DBE firms:(608) 267-3849.
- c. DBE firms are certified based on various factors including the federal standards from the Small Business Administration that assigns a North American Industrial Classification (NAICS) Codes. DBE firms are only eligible for credit when performing work in their assigned NAICS code(s). If a DBE subcontractor performs work that is not with its assigned NAICS code, the prime contractor should contact the DBE Office to inquire about compatibility with the Business Development Program.

6. Counting DBE Participation

Assessing DBE Work

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 UCP agencies. 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:

- a. The Department counts work performed by the DBE firm's own resources. The Department includes the cost of materials and supplies the DBE firm obtains for the work. The Department also includes the cost of equipment the DBE firm leases for the work. The Department will not include the cost of materials, supplies, or equipment the DBE firm purchases or leases from the prime contractor or its affiliate, with the exception of non-project specific leases the DBE has in place before the work is advertised.
- b. The Department counts fees and commissions the DBE subcontractor charges for providing 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 program engineer deems reasonable based on experience or prevailing market rates.
- c. If a DBE firm subcontracts work, the Department counts the value of the work subcontracted to a DBE subcontractor.
- d. The contractor will maintain records and may be required to furnish periodic reports documenting its performance under this item.
- e. It is the Prime Contractor's responsibility to determine whether the work that is committed and/or contracted to a DBE 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.

- f. It is the Prime Contractor's responsibility to assess the DBE firm's ability to perform the work for which it 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.
- g. The Prime Contractor will inform the DBE office via email of all DBE subcontractors added to the project following execution of the contract. The Prime Contractor may omit submission of another form DT1506, but must submit signed Attachment A forms for additional DBE firms.
- h. See Section 7 for DBE credit evaluation for Trucking and Section 8 for DBE credit evaluation for Manufacturers, Suppliers, and Brokers

Naming conventions: When emailing files, please use the following language to identify your submission- "Project #, Proposal #, Let date, Business Name, Attachment A" Email: DBE_Alert@dot.wi.gov

*Note: A sublet request is required for DBE work, regardless of subcontract tier, and also for reporting materials or supplies furnished by a DBE.

- Sublet Requests via form DT1925 or WS1925 are required for 1st Tier DBEs
- For all 2nd Tier and below notification of DBE sublet is indicated by the contractor entering them in CRCS

7. Credit Evaluation for Trucking

All bidders are expected to adhere to the Department's current trucking policy posted on the HCCI website at: <http://wisconsin.gov/Documents/doing-bus/civil-rights/dbe/trucking-utilization-policy.pdf>

The prime contractor is responsible for ensuring that all subcontractors including trucking firms, receive Form FHWA 1273: <https://www.fhwa.dot.gov/programadmin/contracts/1273/1273.pdf>

See Section 8 for Broker credit.

8. 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 firm provides under the contract for DBE credit based on whether the DBE firm is a manufacturer, supplier, or broker. Generally, DBE credit is determined through evaluation of the DBE owner's role, responsibility, and contribution to the transaction. Maximum DBE credit is awarded when the DBE firm manufactures materials or supplies. DBE credit decreases when the DBE firm solely supplies materials, and minimal credit is allotted when the DBE firm's role is administrative or transactional. It is the bidder's responsibility to confirm that the DBE firm is considered a supplier or a manufacturer before listing them on Commitment to Subcontract to DBE form DT1506 or DBE Commitment submitted with the bid.

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, **100%** percent of the cost of the materials or supplies counts 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.
- (4) When DBE suppliers are contracted, additional documentation must accompany the DBE Commitment and Attachment A forms. An invoice or bill-of-sale that includes names of the bidder and the DBE supplier, along with 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 per b.(1) above.
 - i. The bidder should respond to the following questions and include with submission of form DT1506 or the DBE Commitment entered with bid:
 - a. What is the product or material?
 - b. Is this item in the prime's inventory or was the item purchased when contract was awarded?
 - c. Which contract line items were referenced to develop this quote?
 - d. What is the amount of material or product used on the project?
- (5) Supplies purchased in **bulk** from DBE firms at the beginning of the season may be credited to current contracts if submitted with appropriate documentation to the DBE office.
 - i. To ensure that the appropriate credit is assigned, follow the procedure below:
 - a. When DBE suppliers are contracted for bulk supply or commodity purchases, an invoice or bill-of-sale that includes names of the contractor and the DBE supplier should be submitted to the DBE Office via eSubmit (preferred during letting) or the DBE_Alert email box. The supply/commodity credit may be applied during the federal fiscal year (October- September) in which the purchase was made.
 - b. When the contractor intends to apply the credit to a particular project, submit a copy of the original invoice, documentation of the calculations for supplies/commodities to be used on the project, and an Attachment A. Indicate on the Attachment A:
 - c. This supply/commodity is in the prime's inventory or pre-paid in case of commodities
 - d. The full value of the original invoice submitted to the DBE Office, above in (1)
 - e. The amount of material or product used on this project
 - f. Fuel estimate listed on Attachment A will be recorded as a deduction from the full fuel purchase amount shown on the invoice
 - ii. DBE Office Process (Applies only to bulk purchases)
 - a. Supply/Commodity commitment is received
 - b. Engineer verifies amount listed on invoice and enters the full amount into spreadsheet
 - c. The amount of credit applied for each project is updated on the spreadsheet until the bulk purchase is exhausted
 - d. Engineer informs contractor when full amount of bulk purchase has been applied

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 are 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, fees, or transportation charges for the delivery of materials or supplies required on a job site.
- (4) Evaluation of DBE credit includes review of the contract need for the item/service, the sub-contract or invoice for the item/service, and a comparison of the fees customarily allowed for similar services to determine whether they are reasonable.

9. DBE Commitment Modification Policy (Formerly "DBE Replacement Policy")

a. Issuing a Contract Change Order

Any changes or modifications to the contract once executed are considered contract modifications and as such require a change order. In addition, the DBE office must provide consent for reduction, termination, or replacement of subcontractors approved on the DBE Commitment *in advance* of the modification for the prime contractor to receive payment for work or supplies. Additions to the DBE Commitment do not require advance notification of the DBE office. (see below e. DBE Utilization beyond the approved DBE Commitment)

b. Contractor Considerations

- (1) A prime contractor cannot modify the DBE Commitment through reduction in participation, termination, or replacement of a DBE subcontractor listed on the approved DBE Commitment 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.
- (2) If a prime contractor reduces participation, replaces, or terminates a DBE subcontractor who has been approved for DBE credit toward its contract, the prime is required to provide documentation supporting its inability to fulfill the contractual commitment made to the Department regarding the DBE utilization.
- (3) The Prime Contractor is required to demonstrate efforts to find another DBE subcontractor to perform at least the same amount of work under the contract as the DBE subcontractor that was terminated, to the extent needed to meet the assigned DBE contract goal. When additional opportunity is available by contract modifications, the Prime Contractor must utilize DBE subcontractors that were committed to equal work items, in the original contract.
- (4) 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 must undertake efforts to maintain its commitment to the assigned DBE goal.
- (5) The DBE subcontractor should communicate with the Prime Contractor regarding its schedule and capacity in the context of the contract. If the DBE firm anticipates that it cannot fulfill its subcontract, they will advise the Prime Contractor and suggest a DBE subcontractor that may replace their services and provide written consent to be released from its subcontract.
 - i. Before the Prime Contractor can request modification to the approved DBE Commitment, the Prime Contractor must:
 - a. Make every effort to fulfill the DBE Commitment by working with the listed DBE subcontractor to ensure that the firm is fully knowledgeable of the Prime Contractor's expectations for successful performance on the contract. Document these efforts in writing.

- b. If those efforts fail, provide written notice to the DBE subcontractor of the Prime Contractor's intent to request to modify the Commitment through reduction in participation, termination, and/or replacement of the subcontractor including the reason(s) for pursuing this action.
- c. Copy the DBE Office on all correspondence related to changing a DBE subcontractor who has been approved for DBE credit on a contract, including preparation and coordination efforts.
- d. Clearly state the amount of time the DBE firm has to remedy and/or respond to the notice of intent to replace/terminate. The DBE must be allowed five days from the date notice was received as indicated by email time stamp or signed certified mail, 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 engineer or project manager confirms that WisDOT has eliminated an item the DBE subcontractor was contracted for.
- e. The DBE subcontractor must acknowledge the contract modification with written response to the Prime Contractor and the DBE Office. If objecting to the subcontract modification, the DBE subcontractor must outline the basis for objection to the proposed modification, providing sound reasoning for WisDOT to reject the prime's request.

c. Request to Modify DBE Subcontracting Commitment

The written request referenced above may be delivered by email or fax. The request must contain the following:

- (1) Project ID number
- (2) WisDOT Contract Project Engineer's name and contact information
- (3) DBE subcontractor name and work type and/or NAICS code
- (4) Contract's progress schedule
- (5) Reason(s) for requesting that the DBE subcontractor be replaced or terminated
- (6) Attach/include all communication with the DBE subcontractor to deploy/address/resolve work completion

Naming conventions: When emailing files, please use the following language to identify your submission- "Project #, Proposal #, Let date, Business Name, MODIFICATION" Email: DBE_Alert@dot.wi.gov + Project Engineer

WisDOT will review the request and any supporting documentation submitted to evaluate if the circumstance and the reasons constitute good cause for replacing or terminating the approved DBE subcontractor.

Good Causes to Replace a DBE subcontractor 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
- The prime has determined that the listed DBE subcontractor is not a responsible contractor
- The listed DBE subcontractor voluntarily withdraws from the project and provides written notice of its withdrawal
- The listed DBE subcontractor is ineligible to receive DBE credit for the type of work required

- A DBE firm owner dies or becomes disabled with the result that the listed DBE subcontractor is unable to complete its work on the contract.

d. Evaluation and Response to the Request

WisDOT's timely response to the Prime Contractor's request for modification of the approved DBE Commitment will be provided to the prime and the WisDOT project engineer via email.

If WisDOT determines that the Prime Contractor's basis for reduction in participation, replacement, or termination of the DBE subcontractor is not consistent with the good cause guidelines, the DBE office will provide a response via email within 48-hours of receipt of request from the Prime Contractor as indicated by email time stamp. The communication will include: the requirement to utilize the committed DBE, actions to support the completion of the contractual commitment, a list of available WisDOT support services, and administrative remedies, including withholding payment to the prime, that may be invoked for failure to comply with federal DBE guidelines for DBE replacement.

The WisDOT contact for all actions related to modification of the approved DBE Commitment is the DBE Program Engineer who can be reached at DBE_Alert@dot.wi.gov or (414) 335-0413.

e. DBE Utilization beyond the approved DBE Commitment

When the prime or a subcontractor increases the scope of work for an approved DBE subcontractor or adds a DBE subcontractor who was not on the approved form DT1506 or DBE Commitment submitted with bid at any time after contract execution, this is referred to as voluntary DBE contract goal achievement. The contractor must follow these steps to ensure that the participation is accurately credited toward the DBE goal:

- (1) Forward a complete, signed Attachment A form to the DBE Office. A complete Attachment A includes DBE subcontractor contact information, signatures, subcontract value, and description of the work areas to be performed by the DBE. The DBE Office will verify the DBE participation and revise the DBE Commitment based on the email/discussion and the new Attachment A.
- (2) When adding to an existing DBE Commitment, submit a new Attachment A to the DBE Alert mailbox
- (3) OR Submit a final Attachment A to DBE Alert during the Finals Process when Compliance receives notice of "Substantially Complete"

Naming conventions: When emailing files, please use the following language to identify your submission- "Project #, Proposal #, Let date, Business Name, New Attachment A" Email: DBE_Alert@dot.wi.gov

Special note on trucking

- DBE truckers added to the sublets in CRCS *will* be approved without DBE credit (You will see a "N" in CRCS instead of "Y")
- Prime Contractors may enter a "place holder" e.g. \$1000.00, for DBE Trucking in CRCS if the full amount of trucking is unknown for sublet purposes only
- The hiring contractor may obtain the Attachment A with DBE signature included but the **Prime Contractor** must sign the Attachment A before submitting
- DBE truckers need to be added to the DBE commitment once. If the DBE trucker is on the initial commitment (DT1506/E1506) there is no requirement to submit another Attachment A for that trucker for that contract.

10. Commercially Useful Function

- a. Commercially Useful Function (CUF) is evaluated after the contract has been executed, while the DBE certified firm is performing contracted work items.
- b. The Department uses Form DT1011, DBE Commercially Useful Function Review and Certification to evaluate if 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 firm 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 work and 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.
- d. Offsite Hauling – when DBE truck will haul between a pit and plant or location other than the construction site associated with the commitment
 - (1) Indicate Offsite Hauling on Attachment A
 - (2) Discuss offsite hauling at weekly progress meetings with Project Engineer (PE)
 - (3) PE conducts spot checks of pits/plants to verify DBE truck is hauling and/or verifying hauling log
 - (4) Prime should be prepared to submit haul tickets, plant/pit tickets, timecards, and other pertinent documentation if requested by PE or DBE Office

11. Credit Evaluation for DBE Primes

WisDOT calculates DBE credit based on the amount and type of work performed by DBE certified firms for work submitted with required documentation. If the prime contractor is a DBE certified firm, the Department will only count the work that the DBE prime performs with its own forces for DBE neutral credit. The Department will also calculate DBE credit for work performed by any other DBE certified subcontractor, DBE certified supplier, and DBE certified manufacturer on the contract in each firm's approved NAICS code/work areas that are submitted with required documentation. Crediting for manufacturers and suppliers is calculated consistent with Section 8 of this document and 49 CFR Part 26.

12. Joint Venture

A joint venture is an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest. If a DBE performs as a participant in a joint venture, the Department will only credit the portion of the total dollar value of the contract equal to the portion of the work that the DBE performs with its own forces.

13. Mentor-Protégé

- a. If a DBE performs as a participant in a mentor-protégé agreement, the Department will credit the portion of the work performed by the DBE protégé firm.
- b. DBE credit is 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.
 - (1) DBE credit may only be awarded to a non-DBE mentor firm for using its own protégé firm for less than one half of its goal on any contract; and
 - (2) Not award DBE credit to a non-DBE mentor firm for using its own protégé firm for more than every other contract performed by the protégé firm.
- c. A DBE protégé firm may be eligible for conditional NAICS code extension for training with the mentor. Request permission from the DBE Office- Certification area.
- d. Refer to WisDOT's Mentor-Protégé guidelines for guidance on the number of contracts and amount of DBE credit allowed on WisDOT projects.

14. 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 subcontractor, a prime contractor, and the regular dealer or 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 firm in cases where the DBE subcontractor and materials have been approved 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 firm is part of the value of work performed by the DBE to be counted toward the goal. To receive credit, the DBE firm 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 Contractor 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 or the 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 approved supplies.
- b. The DBE subcontractor is responsible for furnishing and/or installing the material/work item and is not an 'extra participant' in the transaction. The DBE firm'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 Contractor 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 contractor's negotiated unit price.

15. Payment

Costs for conforming to this Additional Special Provision (ASP) and any associated DBE requirements are incidental to the contract.

Appendix A

Substantive Conversation Guidelines

The substantive conversation is critical to all bidders' demonstration of good faith effort to meet the DBE goal prior to bid opening. Relationship building between primes and subcontractors is crucial to DBE goal attainment. Responsible bidders seek to build rapport with potential DBE subcontractors to understand capacity, areas of expertise, and assess contracting feasibility. Bidders who compete for WisDOT contracts are specialty contractors responding to a growing and changing contract environment. Just as these specialists are responsible for care of the roads, they are likewise responsible for contributing to the health of the industry. The substantive conversation drives collaboration that will build industry health and capacity. The following is intended to provide guidance for such discussions but is not an exhaustive list. Contractors are encouraged to incorporate their existing strategies for cultivating business relationships as well.

Prior to Bid Opening- this discussion should happen as early as possible (WisDOT advertisements are released weeks prior to each Let)

1. Determine DBE subcontractor's interest in quoting
2. If response indicates inexperience with quoting- offer support/assistance to the DBE in understanding the industry including fundamentals a subcontractor needs to know, required reading and/or resources.
3. Assess their interest and experience in the road construction industry by asking questions such as:
 - Have you competed for other WisDOT contracts? Ratio of competed/to wins
 - Have you performed on any transportation industry contracts (locally or with other states)?
 - What the largest contract you've completed?
 - Have you worked in the industry: apprentice, journeyman, safety, inspection etc.?
 - Does this project fit into your schedule? Are you working on any contracts now?
 - Have you reviewed a copy of the plans? Are you comfortable performing within the scope and quantity considerations of this contract?
 - What region do you work in? Home base?
 - Which line items are you considering?
 - Have you read/are you familiar with WisDOT Standard Specifications? Construction Material Manual?
 - Do you understand where your work fits in the project schedule, project phases?

Following Bid Opening- this discussion can happen at any time

1. After reviewing their quote, note the following in your discussion:
 - Does the quote look complete? Irregular?
 - Are there errors in the quote? Are items very high or very low?
 - In general, does the quote look competitive?
2. Questions and Advice for the bidder to share with the potential DBE subcontractor:
 - What line items would typically be in a competitive quote for a subcontractor of their specialty?
 - How many employees and what is their role/experience/expertise in your firm?
 - Do you have resources for labor (union member, family-based, community-resourced) and capital (banking relationship, bond agent, CPA)?
 - Where have you worked: cities, states, government, commercial, residential/private sector, etc. Explain similarities or differences.
 - Refer them to reliable, trusted, industry resources that can educate or connect them to relevant resources, education/certification resources, more appropriate contract opportunities.
 - Discussion about prime contract and subcontract liability, critical path items, contract quantities, schedule risks, and potential profit/loss (for upcoming known projects or in general).
 - Discussion of bonding, insurance, and overall business risk considerations.

Appendix B

Sample Contractor Solicitation Letter Page 1

(This sample is provided as a guide, not a formatting requirement)

DBE Solicitation - [Month] [Day], [Year] WisDOT Bid Letting

Attention all DBEs. [Prime Contractor] is actively seeking your quote for the [Month][Day], [Year] Bid Letting. [Prime Contractor] is considering bidding on the projects listed on page 2 as a prime contractor. Please see page 2 for instructions and the sub-contractable opportunities for each proposal.

Does [Prime Contractor] accept quotes in areas we might self-perform? Yes, we do! We support this federal rule and (if needed) we consider areas we might self-perform an opportunity to provide in the field assistance and training if we award your quote.

Where can DBEs find the plans, specifications & addenda? Please visit [Prime Contractor's] plan room [LINK] or on WisDOT's Highway Construction Contract Information HCCI website: [Wisconsin Department of Transportation Highway Construction Contract Information \(wisconsindot.gov\)](https://www.wisconsin.gov/transportation/highway-construction-contract-information). This same website can be checked for the contract status.

What should your quote include? All the costs required to complete the items you propose to perform including labor, equipment, material, and related bonding or insurance. The quote should also note items that you are DBE certified to perform, tied items, and any special terms. Please use page 2 as your cover sheet for your quote.

Do you have a question regarding bonding, credit, insurance, equipment, or supplies/materials? We welcome all DBE questions! Please call [Prime Contractor] and ask to speak with [Contact]. [Prime Contractor] can provide basic information as well as a referral to a trusted industry partner for insurance and bonding needs.

When are quotes due?

[Month] [Day], [Year] at [Time]. We accept quotes via SBN, email, or fax. Please make every effort to have your quotes in by this time or earlier. Quality check your quote so it includes the correct letting date, project ID, proposal number, unit price and extension.

Who can DBEs contact for questions, information, clarification or for a quote evaluation? [Project Manager Name] [Phone] [Email]. If you are quoting [Prime Contractor] for the first time, we encourage you to come meet with us in person to discuss the project. Our office hours are 7:30 a.m. – 5:00 p.m. On bid day, we are in the office by 6:30 a.m.

Why partner with [Prime Contractor]?

DBE partnership is a core part of [Prime Contractor's] mission. Including DBEs at the beginning of each project is essential in the success of each project. We consider DBEs to be important industry partners who bring dedication and knowledge at various stages during construction. We are proud to be an industry leader with our DBE partnership. Your success as a DBE is our success.

Sample Contractor Solicitation Letter Page 2
(This sample is provided as a guide, not a formatting requirement)
 REQUEST FOR QUOTE

[Prime Contractor]
Letting Date: [Month] [Day], [Year]
Project IDs: 1234-56-00 (Proposal #1) & 1234-01-78 (Proposal #6)

Please check all that apply:

- Yes, we will be quoting the projects & 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 Contact: _____ DBE: _____
 Phone: _____ Fax: _____
 Email: _____

Please circle the proposals and items you will be quoting below and contact us with any questions

Proposal County	1 Dane County	6 Crawford County
Clearing & Grubbing	X	X
Dump Truck Hauling	X	X
Curb/Gutter/Sidewalk	X	
Erosion Control Items		X
Excavation	X	X
Pavement Marking		X
Traffic Control	X	
Sawing	X	X
QMP, Base		X
Pipe Underdrain	X	
Landscape		X
Beam Guard	X	
Electrical	X	
Signs/Posts/Markers		X
Survey/Staking		X

Again, please make every effort to have your quotes into our office by time deadline prior to the letting date.

Sample Contractor Solicitation Email - Simplified
(This sample is provided as a guide, not a formatting requirement)

ATTENTION DBEs

- **[Prime Contractor] specializes in municipal projects in the XX Region(s)**
- **We have successfully competed for and completed XX WisDOT projects over the past XX years**
- **Consider [Prime Contractor] your partner on WisDOT Projects**

[Prime Contractor] is seeking your subcontractor quote for the XX/XX/20XX WisDOT bid letting on the below projects:

Project	Proposal	County	Region
1234-56-00	2	Dane	SW
1234-01-78	6	Crawford	SW

- Please review the attachments **[attach Solicitation Letter]** and respond with your intent to quote (or not) along with the work items you are interested in performing and respond via fax or email by **date**. The quote should note items that you are DBE certified to perform, tied items, and any special terms. Please include labor, equipment, material, and related bonding or insurance.
- If you have any questions regarding bonding, credit, insurance, equipment and/or materials/supplies, please feel free to call [Prime Contractor] and ask for [Contact]. **(Include if your company is willing to answer these types of DBE questions)**
- Plans and Specifications can be found: **WisDOT HCCI Website: List webpage where plans are located**
- If you do choose to quote, please make every effort to have your quote into our office by **time and date**. Make sure the correct letting date, project number, unit price and extension are included in your quote.
- Should you have questions regarding the mentioned project, please call our office at (414) 555-5555 and we will direct you to the correct estimator/project manager.
Our office hours are 7:30 a.m. - 5:00 p.m.

Thank you – we look forward to working with your company on this project!

Prime Contractor
Project Manager
 Direct: 414-555-5555
 Cell: 414-555-5556

Sample Contractor Solicitation Email to **non-DBE** WisDOT Subcontractors - Simplified

(This sample is provided as a guide, not a formatting requirement)

ATTENTION WisDOT SUBCONTRACTORS

[Prime Contractor] is considering bidding on the below projects for the **XX/XX/20XX WisDOT Bid Letting**:

Project	Proposal	County	Region	DBE Goal
1234-56-00	2	Dodge	SW	6.00%
1234-01-78	11	Adams	NC	3.00%
1234-00-99	20	Buffalo	NW	5.00%
1234-00-98	33	Portage	NC	6.00%

The above projects have DBE goals and [Prime Contractor] is committed to DBE inclusion with every project. As such, we are requesting:

- All WisDOT Subcontractors to **solicit and utilize** DBEs in your quotes.
- DBE participation can be achieved through purchasing materials from DBE suppliers, using DBE subcontractors and/or DBE trucking firms or any combination of these.
- If there is an opportunity to untie an item in your quote so a DBE can be utilized, please look for those opportunities as well.
- Your quote will be evaluated based on the amount of DBE participation your company is able to provide when compared to other quotes for the same work.

If you do choose to quote, please make every effort to have your quote into our office by **time and date**. Please submit all quotes to [Email]. Make sure the correct letting date, project number, unit price and extension are included in your quote.

Should you have questions regarding the mentioned project, the Project Manager contact is: [Name] [Phone Number] [Email]

Thank you for utilizing DBEs who are trusted industry partners with WisDOT projects.

Prime Contractor
 Project Manager
 Direct: 414-555-5555
 Cell: 414-555-5556

Appendix C

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 later completion.
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 help small businesses learn more about opportunities, compete more effectively, network with other contractors and subcontractors, and win more jobs. The DBE will provide free SBN accounts to DBEs when requested. Use DBE_Alert@dot.wi.gov to request an account. **DBE firms can:**

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.

Appendix D

Good Faith Effort Evaluation Measures *by categories referenced in DBE regulations*

Bidders must demonstrate that they took all necessary and reasonable steps to achieve the assigned DBE contract goal. For each contract, all bidders must submit documentation indicating the goal has been met or if falling short of meeting the assigned goal, must request a DBE Goal Waiver and document all efforts employed to secure DBE subcontractor participation on Form DT1202.

DBE staff analyze the bidder's documented good faith efforts to determine if action taken was sufficient to meet the goal. Sufficiency is measured contract-by-contract. WisDOT evaluates active and aggressive efforts, quality, quantity, scope, intensity, and appropriateness of the bidder's efforts as a scale of the principles of Good Faith outlined in 49 CFR Part 26, Appendix A. Additional emphasis is placed on the bidder's demonstration of timely submission of documentation and communication with DBE subcontractors, and business development initiatives undertaken to support DBE firm growth.

The following is a sample of good faith effort activities that are rated according to the accompanying rubric. Contractors are encouraged to identify additional activities that align with their business type(s).

- Personal, tailored solicitation to firms that specialize in work types planned or desired for subcontracting
- Follow up to initial solicitation via email or phone
- Substantive conversation including topics such as contract liability, critical path work items, schedule risks, and potential profit/loss
- SBN utilization including posting quotes
- Review and response to DBE quotes including provision of information about plans, specifications, and requirements as applicable
- Documentation requesting subcontractors support DBE goal by solicitation and inclusion of DBE subcontractor quotes
- Responsive and timely submission of organized documentation
- Analysis of number of DBE firms who do work types that you typically subcontract
- Analysis of number of DBE firms who reside in geographical areas where prime seeks work
- Analysis of firms who express interest in bidding/quoting including the number of firms who declined your solicitation
- Reference check of DBE subcontractor work or training (documentation of questions and response required)
- Number of different efforts undertaken to meet the assigned DBE goal as documented in accompanying Form DT1202
- Submission of all DBE quotes received matched with a variety of work to be performed by DBEs
- Number and names of DBE firms provided written advice, or referral to industry-specific business development resources
- Overall pattern of DBE utilization on all WisDOT contracts which may include contracting with municipalities
- Documentation of resources expended to meet assigned DBE goal (#of hours, staff titles, average pay rate, actions taken)
- Analysis of subcontractable work items to be completed by prime beyond prime contractor's 30%
- Risk analysis of work items that are typically in tied quotes that could be unbundled
- List of contract work items in smallest economically feasible units, identifying schedule impact
- Submission of a Gap Analysis identifying DBE skillset and/or industry needs
- Staff training in EEO and Civil Rights laws as documented in training logs
- Written Capacity Assessment completed with DBE firm documenting its ability to perform the work quoted
- DBE engagement efforts beyond simple solicitation that include a substantive discussion, initiated as early in the acquisition process as possible (*points added for each day prior to letting*)
- Outreach and marketing efforts with minority, women, and veteran-focused organizations at least 10 days prior to bid opening
- Active involvement in WisDOT's Business Development Program, TrANS training, facilitated networking efforts, workshops
- Customized teaching/training efforts for future opportunities with DBE subcontractor, contract specific and/or annually
- Introduction and reference provided for DBE subcontractor to a prime who has not previously contracted with the DBE firm
- Prime utilization of a DBE subcontractor the prime has not contracted with previously
- Written referral/recommendation to bond/insurance agents, manufacturer, supplier
- Documented efforts fostering DBE participation through administrative and/or technical assistance
- Evidence of negotiation with the DBE firm about current and future Let opportunities
- Recommendation of local and state services that support small business and access to opportunity: DOA, SBA, WEDC, WPI, etc.
- Advice on bonding, lines of credit, or insurance as required to complete the items quoted and contract requirements

GFE Evaluation Rubric – Phase 1 – Initial Review

DT1202	Examples	Rating	OBOEC Feedback
Solicitation Documentation	<p>Identify all reasonable and available activities performed to solicit the interest of all certified DBEs who have capacity and ability to perform work on the project.</p> <p><i>Such as: Updated solicitation letter and email, timely solicitation, and follow-up, and/or utilized various methods to communicate solicitation (ex: letter, email, publication, posting and/or website)</i></p>		
Selected Work Items Documentation	<p>All work items are broken out into economically feasible units to facilitate DBE participation.</p> <p><i>Such as: Selected work items are <u>specific</u> to each proposal and clearly identified in all solicitation(s)</i></p>		
Documentation of Project Information provided to Interested DBEs	<p>Provide interested DBEs with adequate information about the plans, specifications, and any other contractual requirements in a timely manner to assist DBEs in response to solicitation.</p> <p><i>Such as: Project information is clearly identified in all solicitation(s)</i></p>		
Documentation of Negotiation with Interested DBEs	<p>Provide sufficient evidence demonstrating that good faith negotiations took place during the bid letting.</p> <p><i>Such as: Documented attempts with DBEs or on behalf of DBEs to increase DBE participation</i></p>		
Documentation of Sound Reason for Rejecting DBEs	<p>Provide sufficient evidence demonstrating that DBEs are rejected for sound reasons.</p> <p><i>Such as: Detailed and thoughtful analysis that considers both the percentage and dollar difference when rejecting a DBE including past performance, relevant business experience and stability, safety record, business ethic and integrity, technical capacity, and other tangible factors.</i></p>		
Documentation of Assistance to Interested DBEs- bonding, credit, insurance, equipment, supplies/materials	<p>Documented assistance in both solicitation(s) and outreach to DBEs.</p>		
Documentation of Outreach to Minority, Women, and Community organizations and other DBE Business Development Support	<p>Effectively use the services of minority, women, and community organizations as well as contractors' groups, local, state, and federal business assistance offices and organization that provide assistance in recruiting and supporting DBEs, as well participation in activities that support DBE business development.</p> <p><i>Such as: Variety of activities that translate into meaningful DBE participation</i></p>		
Documentation of other GFE activities	<p><i>Such as: Used DT1202 Excel Workbook, Diversity & Inclusion company policy, Mentor-Protégé participant, awarded neutral DBE after bid submission, included company GFE overview/strategy information and/or company website highlights DBE opportunities and participation</i></p>		
Overall Demonstration of GFE			

GFE EVALUATION RATING LEGEND – PHASE 1 – Initial Review

Documentation provided by bidder is evaluated and rated on the rubric. Bidders should include activities characterized by the following types of effort:

ACTIVE & AGGRESSIVE: Demonstrated through engaged and assertive activity

QUALITY: Demonstrated through essential character of conscientious and serious activity

QUANTITY: Demonstrated through a measurable number of activities

SCOPE & INTENSITY: Demonstrated through a rigorous approach to an appropriate and purposeful range of activities

TIMING: Demonstrated through engagement efforts beyond simple solicitation, initiated early in the process

GFE EVALUATION – PHASE 2 – Team Review**GFE Team completes:**

- Review of activities included on the rubric
- Review of the intent to award and sound reasoning submitted by Prime
- Bid analysis to confirm if any bid submitted met the DBE goal
- Review average of other bidders DBE goal achievement
- Team review of combined efforts documented in Phase 1 and 2 constitute final GFE determination

Rating Scale:

- **GFE Approval:**
Bona Fide = 6 or more categories color coded green.
Genuine effort characterized by sincere and earnest activities – “Solicitation” and “Sound Reasoning” must be green
- **GFE Approval:**
Sufficient = 5 or more categories color coded green or yellow
Adequate effort documented with a variety of quality activities – “Solicitation” and “Sound Reasoning” must be green or yellow
- **GFE Denial:**
Pro Forma efforts = 4 or less categories color coded green or yellow. Perfunctory effort characterized by routine or superficial activities

Green = Exceeds expectations

Yellow = Meets expectations

Red = Areas in need of attention and/or absence of documentation

See OBOEC Rubric Analysis Feedback

Excerpt from Appendix A to 49 CFR Part 26:

V. In determining whether a bidder has made good faith efforts, it is essential to scrutinize its documented efforts. At a minimum, you must review the performance of other bidders in meeting the contract goal. 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 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. As provided in §26.53(b)(2)(vi), you must also require the contractor to submit copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract to review whether DBE prices were substantially higher; and contact the DBEs listed

GFE RUBRIC ANALYSIS	
OBOEC DECISION	APPROVAL OR DENIAL
Prime Contractor	
Proposal	
Project	
Bid Letting	
DBE Goal Amount	
DBE Goal Amount Achieved	
Bid Analysis	
Goal %	Achieved %
Apparent Low Bidder	%
Bidder B	
Bidder C	
Average of OTHER Bidders (Not including Apparent Low Bidder)	
DBE Quotes Received	
DBE Quotes Awarded	
DBE Quote(s) Rejected	Rejected Quote Analysis
DBE Quote(s) Awarded	Awarded DBE Amount

Appendix E

Good Faith Effort Best Practices

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 be thorough 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 F

Good Faith Effort Evaluation Guidance

Appendix A of 49 CFR Part 26

I. When, as a recipient, you establish a contract goal on a DOT-assisted contract for procuring construction, equipment, services, or any other purpose, a bidder must, in order to be responsible and/or responsive, make sufficient 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, you have the responsibility 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, based on the regulations and the guidance in this Appendix.

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. Determinations should not be made using quantitative formulas.

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. (1) Conducting market research to identify small business contractors and suppliers and soliciting through all reasonable and available means the interest of all certified DBEs that have the capability to perform the work of the contract. This may include attendance at pre-bid and business matchmaking meetings and events, advertising and/or written notices, posting of Notices of Sources Sought and/or Requests for Proposals, written notices or emails to all DBEs listed in the State's directory of transportation firms that specialize in the areas of work desired (as noted in the DBE directory) and which are located in the area or surrounding areas of the project.

(2) The bidder should solicit this interest as early in the acquisition process as practicable to allow the DBEs to respond to the solicitation and submit a timely offer for the subcontract. The bidder should 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 (for example, smaller tasks or quantities) to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces. This may include, where possible, establishing flexible timeframes for performance and delivery schedules in a manner that encourages and facilitates DBE participation.

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 with their offer for the subcontract.

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. (1) 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 status) are not legitimate causes for the rejection or non-solicitation of bids in the contractor's efforts to meet the project goal. Another practice considered an insufficient good faith effort is the rejection of the DBE because its quotation for the work was not the lowest received. However, nothing in this paragraph shall be construed to require the bidder or prime contractor to accept unreasonable quotes in order to satisfy contract goals.

(2) A prime contractor's inability to find a replacement DBE at the original price is not alone sufficient to support a finding that good faith efforts have been made to replace the original DBE. The fact that the contractor has the ability and/or desire to perform the contract work with its own forces does not relieve the contractor of the obligation to make good faith efforts to find a replacement DBE, and it is not a sound basis for rejecting a prospective replacement DBE's reasonable quote.

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, it is essential to scrutinize its documented efforts. At a minimum, you must review the performance of other bidders in meeting the contract goal. 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 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. As provided in §26.53(b)(2)(vi), you must also require the contractor to submit copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract to review whether DBE prices were substantially higher; and contact the DBEs listed on a contractor's solicitation to inquire as to whether they were contacted by the prime. Pro forma mailings to DBEs requesting bids are not alone sufficient to satisfy good faith efforts under the rule.

VI. A promise to use DBEs after contract award is not considered to be responsive to the contract solicitation or to constitute good faith efforts.

[79 FR 59600, Oct. 2, 2014]

Appendix G

(SAMPLE) Forms DT1506 and DT1202

**COMMITMENT TO SUBCONTRACT TO DBE
ATTACHMENT A**

CONFIRMATION OF PARTICIPATION

Project I.D.:	Proposal Number:
Letting Date:	

Name of DBE Firm Participating in this Contract:	
Name of the Prime/Subcontractor who hired the DBE Firm: <i>(list all names of tiers if more than one)</i>	
Type of Work or Type of Material Supplied:	
Total Subcontract Value:	Total DBE Credit Value:

FOR PRIME CONTRACTORS ONLY: I certify that I made arrangements with the participating DBE firm to perform the type of work listed or supply the material indicated above for the subcontract value listed above.	Prime Contractor Representative's Signature
	Prime Contractor Representative's Name (Print Name)
	Prime Contractor (Print Company Name)
	Date

FOR PARTICIPATING DBE FIRMS ONLY: I certify that I made arrangements with the Prime Contractor or the Hiring Contractor to perform the type of work or supply the material indicated above for the subcontract value listed above.	Participating DBE Firm Representative's Signature	Date
	Participating DBE Firm Representative's Name (Print Name)	
	Participating DBE Firm (Print Company Name)	
	DBE Firm's Address:	
FOR DBE TRUCKING FIRMS ONLY: I certify that I will utilize, for DBE credit, only trucks listed on my WisDOT approved Schedule of Owned/Leased Vehicles for DBE Credit form and I will be utilizing the number of trucks as listed below.		

# Owned Trucks	# Leased Trucks	# DBE-Owned Leased Trucks	# Non-DBE-Owned Leased Trucks

Off site Hauling



DOCUMENTATION OF GOOD FAITH EFFORT
 Wisconsin Department of Transportation
 DT1202.....3/2020



Project ID *****	Proposal No. *****	Letting *****
Prime Contractor *****	County *****	
Person Submitting Document *****	Telephone Number *****	
Address *****	Email Address *****	

All bidders must undertake necessary and reasonable steps to achieve the assigned DBE contract goal per federal regulatory guidance at 49 CFR Part 26. Bidders use this form to document all efforts employed to meet the assigned goal as a record of contractor good faith efforts (GFE). Refer to ASP3 or 49 CFR Part 26 for guidance on actions that demonstrate good faith effort.

It is critical to list all efforts, attach documentation, and follow the instructions to complete this submission. Documentation of good faith effort includes copies of each DBE and non-DBE subcontractor quote submitted to the bidder for the same line items. Utilize the sample documentation logs to document and organize efforts.

Submit good faith effort documentation per ASP-3 guidelines.

Instructions: Provide a narrative description of all activities pursued to demonstrate good faith efforts, any corresponding documentation, and applicable explanation on separate pages. Include the following items, organized in the order listed below.

1. Solicitation Documentation:

- a. **Purpose:** To identify all reasonable and available activities the bidder performed to solicit the interest of all certified DBEs who have the capacity and ability to perform work on the project. All solicitation efforts should begin as early as possible to ensure DBEs have ample time to respond and ask questions.
- b. **Action:** Identify and list all activities engaged in to solicit DBEs using all reasonable and available means such as written notice and follow-up communications; substantive conversations; pre-bid meetings; networking events; market research; advertising.

2. Selected Work Items Documentation:

- a. **Purpose:** To ensure that all work items are broken out into economically feasible units to facilitate DBE participation. This must occur even when you prefer to perform the work yourself.
- b. **Action:** Identify economically feasible work units to be performed by DBEs to include activities such as: list of work items to be performed; breaking up of large work items into smaller tasks or quantities; flexible time frames for performance and delivery schedules.

3. Documentation of Project Information provided to Interested DBEs:

- a. **Purpose:** To provide interested DBEs with adequate information about the plans, specifications, and any other contractual requirements in a timely manner to assist DBEs in response to solicitation.
- b. **Action:** Provide DBEs access to plans, specifications, and other contract requirements. Early solicitation allows ample opportunity to provide project information, links to Let advertisements, and substantive engagement with DBEs.

4. → Documentation of Negotiation with Interested DBEs:

a. → Purpose: To ensure that negotiations with interested DBEs were made in good faith providing evidence as to why agreements could not be reached for DBEs to perform work.

b. → Action: Provide sufficient evidence to demonstrate that good faith negotiations took place. Merely sending out solicitations requesting bids from DBEs does not constitute sufficient good faith efforts. A bidder using good business judgment considers a number of factors in negotiating with all subcontractors, and the firm's price and capabilities in addition to contract goals are taken 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 failing to meet the DBE goal as long as costs are reasonable. (see 49 CFR Part 26 Appendix A)

5. → Documentation of Sound Reason for Rejecting DBEs:

a. → Purpose: To ensure that bidders avoid rejecting DBEs as unqualified without sound reasons. Reasons for rejection must be based on thorough investigation of DBE capabilities.

b. → Action: Provide sufficient evidence to demonstrate that DBE was rejected for sound reasons such as past performance, relevant business experience and stability, safety record, business ethic and integrity, technical capacity, other tangible factors.

6. → Documentation of Assistance to Interested DBEs - Bonding, Credit, Insurance, Equipment, Supplies/Materials:

a. → Purpose: To assist interested DBEs in obtaining bonds, lines of credit, insurance, equipment, supplies, materials, and other assistance or services.

b. → Action: Assist interested DBEs in obtaining bonding, lines of credit or insurance, and provide technical assistance or information related to plans, specifications, and project requirements. Assist DBEs in obtaining equipment, supplies, materials or other services related to meeting project requirements (excluding supplies or equipment the DBE purchases from the prime).

7. → Documentation of outreach to Minority, Women, and Community Organizations and other DBE Business Development Support:

a. → Purpose: To effectively use the services of minority, women, and community organizations as well as contractors' groups, local, state, and federal business assistance offices and organization that provide assistance in recruiting and supporting DBEs, as well as participation in activities that support DBE business development.

b. → Action: Contact organizations and agencies for assistance in contacting, recruiting, and providing support to DBE subcontractors, suppliers, manufacturers, and truckers at least 14 days before bid opening. Participate in or host activities such as networking events, mentor-protégé programs, small business development workshops, and others consistent with DBE support.

Return to:
Wisconsin Department of Transportation
DBE Program Office
PO Box 7965
Madison, WI 53707-7965
DBE_Alert@dot.wi.gov

I certify that I have utilized comprehensive good faith efforts to solicit and utilize DBE firms to meet the DBE participation requirements of this contract proposal, as demonstrated by my responses and as specified in Additional Special Provision 3 (ASP-3).

I certify that the information given in the Documentation of Good Faith Efforts is true and correct to the best of my knowledge and belief.

I further understand that any willful falsification, fraudulent statement, or misrepresentation will result in appropriate sanctions, which may involve debarment and/or prosecution under applicable state (Trans 504) and Federal laws.

		(Bidder/Authorized Representative Signature)

		(Print Name)

		(Title)

Good-Faith-Effort--Sample-Documentation-Logs

The sample logs below are provided as guides rather than exhaustive list. See ASP3, Appendix A for additional examples of demonstrable good faith efforts. Attach documentation for each activity listed.

Acceptable forms of documentation include copies of solicitations sent to DBEs, notes from substantive conversations and negotiations with DBEs, copies of advertisements placed, email communications, all quotes received from DBEs and from all subcontractors who were considered alongside DBE quotes, proof of attendance at applicable networking events; flyers for events or workshops for DBEs offered by the prime, and other physical records of good faith efforts activities.

SOLICITATION LOG

Date	Activity	Name of DBE Solicited	Follow-up
4/1/2020	Sent May-Let solicitation	Winterland Electric	Spoke with Mark Winterland on 4/15/20 to ask if he would quote.

SELECTED WORK ITEMS SOLICITED LOG

Work Type	DBE Firm	Contact Person	Date	Contact Mode
Pavement Marking	ABC Marking	Leslie Lynch	4/1/2020	Email; phone
	#1 Marking Co.	Mark Smart	4/1/2020	Email; left VM
Electrical	Winterland Electric	Tabitha Tinker	4/3/2020	Email; left VM
	Superstar Wiring	Jose Huascar	4/3/2020	Email; phone

INFORMATION PROVIDED LOG

Request Date	DBE Firm	Information Requested & Provided	Response Date
4/1/2020	Winterland Electric	Requested info on electrical requirements; provided plan and link to specs	4/3/2020
4/21/2020	Absolute Construction	Wanted to know how and when supplies are paid for by WisDOT; referred to spec that covers stockpiling	4/21/2020

NEGOTIATIONS LOG

Date	DBE Firm	Contact Name	Work Type	Quotes Rec'd?	Considered for project?	If not selected, why?
4/12/2020	ABC Landscape	John Dean	Erosion Control	Yes	No	Cannot perform all items
4/17/2020	Wild Ferns	Sandy Lynn	Erosion Control	Yes	Yes	
4/20/2020	#1 Marking	Mark Smart	Electrical	Yes	Yes	

ASSISTANCE LOG

Date	DBE Firm	Contact Person	Assistance Provided
4/1/2020	ABC Sawing	Jackie Swiggle	Informed DBE on how to obtain bonding
4/17/2020	Supreme Construction	Winston Walters	Provided contact for wholesale supply purchase

OUTREACH & BUSINESS DEVELOPMENT LOG

Date	Agency/Organization Contacted	Contact Person	Assistance Requested
4/1/2020	Women in Construction	LaTonya Klein	Contact information for woman-owned suppliers
4/28/2020	WBIC	Sam Smith	Asked for information to provide to DBE regarding financing programs through WBIC

Official Form DT1202 can be found here: <https://wisconsindot.gov/pages/global-footer/formdocs/default.aspx>

ADDITIONAL SPECIAL PROVISION 4

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.

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 is not allowed to withhold 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.

Acceptance and Final Payment

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.

Additional Special Provision 6 (ASP-6)
Modifications to the standard specifications

Make the following revisions to the standard specifications:

108 Prosecution and Progress

Add subsection 108.9.4.1 effective with the November 2023 letting:

108.9.4.1 Winter Suspension for Completion Date Contracts

- (1) The contractor may request a winter suspension for a completion date contract. If the department determines weather conditions do not allow for the completion of the remaining work, the department may approve the contractor's request and determine the start date of the winter suspension. The end date of the winter suspension is March 31 or a date mutually agreed upon by both parties. For multi-year contracts, the department will only consider winter suspension for the final year of the contract.
 - (2) During winter suspension, store all materials in a manner that does not obstruct vehicular and pedestrian traffic and protect the materials from damage. Install traffic control and other safety devices necessary to protect the traveling public and pedestrians. Provide suitable drainage and install temporary erosion control where necessary. If the winter suspension begins when liquidated damages are being assessed, or when the work has not progressed as scheduled and would not have been completed prior to the completion date, the cost of necessary pre-suspension work is incidental. If the winter suspension begins prior to the contract completion date, and the work has progressed as scheduled and would have been completed prior to the completion date, the cost of pre-suspension work will be paid as specified under 109.4.
 - (3) For a winter suspension that begins prior to the contract completion date and the work has progressed as scheduled and would have been completed prior to the completion date, the engineer will extend contract time to correspond with the end of the winter suspension and liquidated damages will not be assessed during the winter suspension.
 - (4) For a winter suspension that begins when liquidated damages are being assessed or when the work has not progressed as scheduled and would not have been completed prior to the completion date, the engineer will not extend contract time. Time will be suspended until the end of the winter suspension. Liquidated damages will not be assessed during the winter suspension and liquidated damages will resume at the end of the winter suspension.
-

108.10.2 Excusable, Non-Compensable Delays

108.10.2.1 General

Replace entire section with the following effective with the January 2024 letting:

- (1) Non-compensable delays, 108.10.2.1(3), are excusable delays not the contractor's or the department's fault. The engineer will not pay for the delay costs listed in 109.4.7 for non-compensable delays.
 - (2) For non-compensable delays under calendar day and completion date contracts, the engineer will extend contract time if the conditions specified in 108.10.1 are met. The department will relieve the contractor from associated liquidated damages, as specified in 108.11, if the engineer extends time under 108.10.1.
 - (3) The following are non-compensable delays:
 1. Delays due to earthquakes, other cataclysmic phenomena of nature the contractor cannot foresee and avoid, severe weather or job conditions caused by recent weather as specified in 108.10.2.2.
 2. Extraordinary delays in material deliveries the contractor or their suppliers cannot foresee and forestall resulting from strikes, lockouts, freight embargoes, industry-wide shortages, governmental acts, or sudden disasters.
 3. Delays due to acts of the government, a political subdivision other than the department, or the public enemy.
 4. Delays from fires or epidemics.
 5. Delays from strikes beyond the contractor's power to settle not caused by improper acts or omissions of the contractor, their subcontractors, or their suppliers.
 6. Altered quantities as specified in 109.3.
-

108.10.3 Excusable Compensable Delays

Replace entire section with the following effective with the January 2024 letting:

- (1) Compensable delays are excusable delays due to the department's actions or lack of actions. The engineer will grant a time extension for a compensable delay if the conditions specified in 108.10.1 are met.
- (2) The following are compensable delays:

1. A contract change for revised work as specified for extra work under 104.2.2.1, for a differing site condition under 104.2.2.2, or for significant changes in the character of the work under 104.2.2.4.
 2. A contract change for an engineer-ordered suspension under 104.2.2.3.
 3. The unexpected discovery of human remains, an archaeological find, or historical find consistent with 107.25.
 4. The unexpected discovery of a hazardous substance consistent with 107.24.
 5. The non-completion of work that utilities or other third parties perform, if that work is not completed as specified in the contract.
- (3) For a compensable delay or a time extension, the department will relieve the contractor from associated liquidated damages under 108.11, and will pay the contractor for delay costs determined as follows:
1. Adjust the contract price as specified in 109.4.2 through 109.4.5 for delays under item 1 of 108.10.3(2).
 2. Adjust the contract price as specified in 109.4.7 for delays under items 2 through 5 of 108.10.3(2).

310 Open Graded Base

310.2 Materials

Replace paragraph two with the following effective with the November 2023 letting:

- (2) The contractor may substitute material conforming to the gradation requirements for crushed aggregate specified in Table 310-01 if that material conforms to the fracture requirements for open-graded crushed gravel specified in 301.2.4.5.

TABLE 310-01 COARSE AGGREGATE (% passing by weight)

AASHTO No. 67 ^[1]	
SEIVE	COARSE AGGREGATE (% PASSING by WEIGHT) AASHTO No. 67
2-inch	-
1 1/2-inch	-
1-inch	100
3/4-inch	90 – 100
1/2-inch	-
3/8-inch	20 – 55
No. 4	0 – 10
No. 8	0 – 5
No. 16	-
No. 30	-
No. 50	-
No. 100	-
No. 200	<=1.5

[1] Size according to AASHTO M43.

390 Base Patching

390.4 Measurement

Replace entire section with the following effective with the November 2023 letting:

- (1) The department will measure Removing Pavement for Base Patching by the cubic yard acceptably completed. Measure the depth from the bottom of the adjacent pavement to the top of the patch.
- (2) The department will measure Base Patching Asphaltic by the ton acceptably completed as specified for asphaltic pavement in 450.4.
- (3) The department will measure Base Patching Concrete HES and Base Patching Concrete SHES by the cubic yard acceptably completed. Measure the depth from the bottom of the adjacent pavement to the top of the patch.

390.5 Payment

Replace entire section with the following effective with the November 2023 letting:

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
390.0100	Removing Pavement for Base Patching	CY
390.0201	Base Patching Asphaltic	TON
390.0305	Base Patching Concrete HES	CY
390.0405	Base Patching Concrete SHES	CY

- (2) Payment for Removing Pavement for Base Patching is full compensation for removing old pavement; for preparing the foundation and bringing up to grade. If the engineer orders the contractor to excavate yielding or unstable subgrade materials and backfill with suitable materials, the department will pay for that work with contract bid items or as agreed upon using 109.4.
- (3) Payment for Base Patching Asphaltic is full compensation for providing and compacting asphaltic mixture including asphaltic binder.
- (4) Payment for Base Patching Concrete HES and Base Patching Concrete SHES is full compensation for providing, curing, and protecting concrete. Payment also includes providing tie bars and dowel bars in unhardened concrete and steel within the patch. For tie bars and dowel bars provided in concrete not placed under the contract, the department will pay separately under the Drilled Tie Bars and Drilled Dowel Bars bid items as specified in 416.5.
- (5) Payment for Base Patching SHES also includes providing test data to the engineer as specified in 416.2.4.
- (6) The department will pay for sawing existing concrete pavement for removal under the Sawing Concrete bid item as specified in 690.5.

460 Hot Mix Asphalt Pavement**460.2.8.2.1.3.1 Contracts with 5000 Tons of Mixture or Greater**

Replace paragraph four with the following effective with the November 2023 letting:

- (4) Use the test methods identified below, or other methods the engineer approves, to perform the following tests at the frequency indicated:

Blended aggregate gradations:

Drum plants:

- Field extraction by ignition oven according to WTM T308, chemical extraction according to AASHTO T-164 method A or B; or automated extraction according to WTM D8159. Gradation of resulting aggregate sample determined according to WTM T30.
- Belt samples, optional for virgin mixtures, obtained from stopped belt or from the belt discharge using an engineer-approved sampling device and performed according to WTM T11 and T27.

Batch plants:

- Field extraction by ignition oven according to WTM T308, chemical extraction according to AASHTO T-164 method A or B; or automated extraction according to WTM D8159. Gradation of resulting aggregate sample determined according to WTM T30.

Asphalt content (AC) in percent:

Determine AC using one of the following methods:

- AC by ignition oven according to WTM T308.
- AC by chemical extraction according to AASHTO T-164 method A or B.
- AC by automated extraction according to WTM D8159.
- If the department is using an ignition oven to determine AC, conform to WTP H003.
- If the department is not using an ignition oven to determine AC, ignition oven correction factor (IOCF) must still be reverified for any of the reasons listed in WTP H003 Table 2 and conform to WTP H-003 sections 3 through 6.
- Gradation of resulting aggregate sample determined according to WTM T30.

Bulk specific gravity of the compacted mixture:

According to WTM T166.

Theoretical maximum specific gravity:

According to WTM T209.

Air voids (Va) by calculation according to WTM T269.

VMA by calculation according to WTM R35.

460.2.8.3.1.4 Department Verification Testing Requirements

Replace paragraph three with the following effective with the November 2023 letting:

- (3) The department will perform testing conforming to the following standards:
 - Bulk specific gravity (G_{mb}) of the compacted mixture according to WTM T166.
 - Maximum specific gravity (G_{mm}) according to WTM T209.
 - Air voids (V_a) by calculation according to WTM T269.
 - VMA by calculation according to WTM R35.
 - Asphalt content by ignition oven according to WTM T308, chemical extraction according to AASHTO T-164 method A or B, or automated extraction according to WTM D8159. If using an ignition oven to determine AC, conform to WTP H-003.

460.3.3.2 Pavement Density Determinations

Replace entire section with the following effective with the February 2024 letting:

- (1) The engineer will determine the target maximum density using department procedures described in WTM T355. The engineer will determine density according to CMM 815 and WTM T355 as soon as practicable after compaction and before placement of subsequent layers or before opening to traffic.
- (2) Do not re-roll compacted mixtures with deficient density test results. Do not operate continuously below the specified minimum density. Stop production, identify the source of the problem, and make corrections to produce work meeting the specification requirements.
- (3) A lot is defined as one day's production for each subplot type or one production shift if running 24 hours per day and placed within a single layer for each location and target maximum density category indicated in table 460-3. The lot density is the average of the tests taken for that lot. The department determines the number of tests per lot according to WTP H-002.
- (4) An HTCP-certified Nuclear Density Technician I (NUCDENSITYTEC-I) or a nuclear density ACT working under a NUCDENSITYTEC-I technician, will locate samples and perform the testing. A NUCDENSITYTEC-I technician will coordinate and take responsibility for the work an ACT performs. No more than one ACT can work under a single NUCDENSITYTEC-I technician. The responsible NUCDENSITYTEC-I technician will ensure that sample location and testing is performed correctly, analyze test results, and provide density results to the contractor weekly.

503 Prestressed Concrete Members

503.2.2 Concrete

Replace paragraph five with the following effective with the November 2023 letting:

- (5) Furnish prestressed concrete members cast from air-entrained concrete, except I-type girders may use non-air-entrained concrete. Use type I, IL, IS, IP, IT, II, or III cement. The contractor may replace up to 30 percent of type I, IL, II, or III cement with an equal weight of fly ash, slag, or a combination of fly ash and slag. Ensure that fly ash conforms to 501.2.4.2.2 and slag conforms to 501.2.4.2.3. Use only one source and replacement rate for work under a single bid item. Use a department-approved air-entraining admixture conforming to 501.2.5.2 for air-entrained concrete. Use only coarse aggregate conforming to 310.2(2).

604 Slope Paving

604.2 Materials

Replace paragraph three with the following effective with the November 2023 letting:

- (3) Under the Slope Paving Crushed Aggregate bid item, furnish crushed stone or crushed gravel conforming to the gradation in Table 604-01, but with the additional requirements that at least 75 percent of the particles, by count, have at least one fractured face. Determine fracture according to WTM D5821.

TABLE 604-01 COARSE AGGREGATE (% passing by weight)

AASHTO No. 4^[1]	
SEIVE	COARSE AGGREGATE (% PASSING by WEIGHT) AASHTO No. 4
2-inch	100
1 1/2-inch	90 - 100
1-inch	20 - 55
3/4-inch	0 - 15
1/2-inch	-
3/8-inch	0 - 5
No. 4	-
No. 8	-
No. 16	-
No. 30	-
No. 50	-
No. 100	-
No. 200	<=1.5

^[1] Size according to AASHTO M43.

612 Underdrains

612.3.9 Trench Underdrains

Replace paragraph one with the following effective with the November 2023 letting:

- (1) Under the Underdrain Trench bid item, excavate and backfill underdrain trenches. Backfill with coarse aggregate gradation conforming to 604.2(3). Before backfilling place geotextile as the plans show.

614 Semi-rigid Barrier Systems and End Treatments

614.2.6 Sand Barrel Arrays

Replace paragraph one with the following effective with the November 2023 letting:

- (1) Furnish sand barrels from the APL. Use fine aggregate conforming to gradation shown in Table 614-2 mixed with sodium chloride conforming to AASHTO M143. Apply an object marker to front-most barrel in the array.

TABLE 614-2 FINE AGGREGATE GRADATION

SEIVE	FINE AGGREGATE (% PASSING by WEIGHT)
3/8-inch	100
No. 4	90 - 100
No. 8	-
No. 16	45 - 85
No. 30	-
No. 50	5 - 30
No. 100	0 - 10
No. 200	<=3.5

628 Erosion Control**628.2.13 Rock Bags**

Replace paragraph two with the following effective with the November 2023 letting:

- (2) Fill the bags with a clean, sound, hard, durable, engineer-approved coarse aggregate conforming by visual inspection to the gradation specified for coarse aggregate gradation in 604.2(3).

639 Drilling Wells**639.2.1 General**

Replace paragraph two with the following effective with the November 2023 letting:

- (2) For grout use fine aggregate conforming to 501.2.7.2; and gradation conforming to 614.2.6(1); and type I, IL, IS, IP, or IT cement.

652 Electrical Conduit**652.3.1.2 Installing Underground**

Replace paragraph two with the following effective with the November 2023 letting:

- (2) Excavate trenches true to line and grade to provide the conduit uniform bearing throughout its length. Do not backfill the trench before inspecting the conduit. Carefully tamp the backfill in place as specified for placing backfill in layers in 651.3. Place at least 0.7 cubic feet of coarse aggregate gradation conforming to 604.2(3) directly under each drainage hole.

ERRATA

390.3.4 Special High Early Strength Concrete Patching

Correct errata link in paragraph (1) by changing from 416.3.8 to 416.3.7.

- (1) Construct as specified for special high early strength repairs under 416.3.7 except as follows:
 - The contractor may delay removal for up to 14 calendar days after cutting the existing pavement.
 - Open to traffic as specified for concrete base in 320.3.

ADDITIONAL SPECIAL PROVISION 7

A. Reporting 1st Tier and DBE Payments During Construction

1. Comply with reporting requirements specified in the department's Civil Rights Compliance, Contractor's User Manual, Sublets and Payments.
2. Report payments to all DBE firms within 10 calendar days of receipt of a progress payment by the department or a contractor for work performed, materials furnished, or materials stockpiled by a DBE firm. Report the payment as specified in A(1) for all work satisfactorily performed and for all materials furnished or stockpiled.
3. Report payments to all first tier subcontractor relationships within 10 calendar days of receipt of a progress payment by the department for work performed. Report the payment as specified in A(1) for all work satisfactorily performed.
4. All tiers shall report payments as necessary to comply with the DBE payment requirement as specified in A(2).
5. DBE firms must enter all payments to DBE and non-DBE firms regardless of tier.
6. 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).
7. All agreements made by a contractor shall include the provisions in A(1), (2), (3), (4), (5), and (6), and shall be binding on all first tier subcontractor relationships, all contractors and subcontractors utilizing DBE firms on the project, and all payments from DBE firms.

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:

<https://wisconsindot.gov/Documents/doing-bus/civil-rights/labornwage/crcs-payments-sublets-manual.pdf>

ADDITIONAL SPECIAL PROVISION 9

Electronic Certified Payroll or Labor Data Submittal

- (1) Use the department's Civil Rights Compliance System (CRCS) to electronically submit certified payroll reports for contracts with federal funds and labor data for contracts with state funds only. Details are available online through the department's highway construction contractor information (HCCI) site on the Labor, Wages, and EEO Information page at:
<https://wisconsindot.gov/Pages/doing-bus/civil-rights/labornwage/default.aspx>
- (2) Ensure that all tiers of subcontractors, including all trucking firms, either submit their weekly certified payroll reports (contracts with federal funds) or labor data (contracts with state funds only) electronically through CRCS. These payrolls or labor data 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 their submittals. 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 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/labor 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:
<https://wisconsindot.gov/Documents/doing-bus/civil-rights/labornwage/crcs-payroll-manual.pdf>

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Non-segregated 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. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

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, United States Code, as required in 23 CFR 633.102(b) (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). 23 CFR 633.102(e).

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. 23 CFR 633.102(e).

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) in accordance with 23 CFR 633.102. 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 solicitation-for-bids or request-for-proposals 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). 23 CFR 633.102(b).

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. 23 CFR 633.102(d).

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. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A 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 Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 230, Subpart A, 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 (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 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 Part 35 and 29 CFR Part 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. 23 CFR 230.409 (g)(4) & (5).

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, sexual orientation, gender identity, 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 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 or other knowledgeable company official.

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, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure 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. 23 CFR 230.409. 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, sexual orientation, gender identity, 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, sexual orientation, gender identity, 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 thereunder. 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, sexual orientation, gender identity, 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, 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. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient 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 recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

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 more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, 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, sexual orientation, gender identity, 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), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

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 (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), 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 basic hourly 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. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act ([40 U.S.C. 3141\(2\)\(B\)](#)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. 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 must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. 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 classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH-1321) must 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. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in [29 CFR part 1](#), a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must 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 be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate 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 used 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) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) 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 will be sent by the contracting officer by email to DBAconformance@dol.gov. 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.

(4) 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 will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The 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.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division

under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must 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.

d. *Fringe benefits not expressed as an hourly rate.* 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 may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* 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, in accordance with the criteria set forth in § 5.28, 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.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and 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.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901–3907](#).

3. Records and certified payrolls (29 CFR 5.5)

a. *Basic record requirements (1) Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; 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 [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section 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 [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act, the contractor must 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.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements (1) Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting

agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (e.g., the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division website at <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347.pdf> or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working 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 [29 CFR part 3](#); and

(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(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH-347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under [18 U.S.C. 1001](#) and [31 U.S.C. 3729](#).

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access (1) Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, 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, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under [29 CFR part 6](#) any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address

of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices (1) Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform 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 (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must 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, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must 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 this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and [29 CFR part 30](#).

c. 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. 23 CFR 230.111(e)(2). 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 journeyworkers 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 as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 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 as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, 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 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 [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, [18 U.S.C. 1001](#).

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#); or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#).

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), 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 watchpersons 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. 29 CFR 5.5.

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 and interest from the date of the underpayment. 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 watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* 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.

* \$31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, 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 that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](#)–3907.

4. **Subcontracts.** The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the

event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. **Anti-retaliation.** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

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" in paragraph 1 of Section VI 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: (based on longstanding interpretation)

- (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. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), 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. Pursuant to 23 CFR 635.116(c), 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. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

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 Part 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. 23 CFR 635.108.

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 Part 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). 29 CFR 1926.10.

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 Part 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 11, 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 (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

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. 2 CFR 180.220 and 1200.220.

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. 2 CFR 180.320.
- 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. 2 CFR 180.325.
- 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. 2 CFR 180.345 and 180.350.

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, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 180.330.

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. 2 CFR 180.220 and 180.300.

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. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. 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 System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

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 CFR 180.325.

* * * * *

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 CFR 180.335;.

(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, 2 CFR 180.800;

(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, 2 CFR 180.700 and 180.800; 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. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

3. 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). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant 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. 2 CFR 180.365.

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, Subpart I, 180.900 – 180.1020, 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 recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 1200.220 and 1200.332.

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. 2 CFR 180.220 and 1200.220.

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 System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

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. 2 CFR 180.325.

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should 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 Part 20, App. A.

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.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor 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. 46 CFR 381.7.

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 Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)**

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).

**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.

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.

BUY AMERICA PROVISION

Buy America (as documented in [88 FR 57750 \(2 CFR part 184 and 200\)](#) from the Office of Management and Budget: [Federal Register: Guidance for Grants and Agreements](#)) shall be domestic products and permanently incorporated in this project as classified in the following three categories, and as noted in the Construction and Materials Manual (CMM):

1. Iron and Steel

All iron and steel manufacturing and coating processes (from the initial melting stage through the application of coatings) 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 the iron and steel manufacturing and coating processes Buy America 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.

2. Manufactured Product

All manufactured products (as defined in CMM 228.5) are covered under a previous waiver from 1983 and are currently exempt from Buy America.

3. Construction Material

All construction materials (as defined in [88 FR 57750 \(2 CFR part 184 and 200\)](#) and as referenced in CMM 228.5) must comply with Buy America. All manufacturing process of construction materials must occur in the United States.

[88 FR 55817 \(DOT-OST-2022-0124\)](#) allows a limited waiver of Buy America requirements for de minimis costs and small grants.

- The Total value of the non-compliant products is no more than the lesser of \$1,000,000 or 5% of total applicable costs for the project¹; or
- The total amount of Federal financial assistance applied to the project, through awards or subaward, is below \$500,000²

The contractor shall take actions and provide documentation conforming to CMM 228.5 to ensure compliance with this Buy America provision.

<https://wisconsin.gov/rdwy/cmm/cm-02-28.pdf>

Upon completion of the project, certify to the engineer, in writing using department form DT4567 that all iron and steel, manufactured products, and construction materials conform to this Buy America provision.

Form DT4567 is available at: <https://wisconsin.gov/Documents/formdocs/dt4567.docx>

Attach a list of iron or steel and construction material exemptions and their associated costs to the certification form.

¹ The de minimis public interest waiver does not apply to iron and steel subject to the requirements of 23 U.S.C. 313 on financial assistance administered by FHWA. The de minimis threshold in 23 CFR 635.410(b)(4) continues to apply for iron and steel.

² The small grant portion of the waiver does not apply to iron, steel, and manufactured goods subject to the requirements of 49 U.S.C. 22905(a).

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.

**WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF TRANSPORTATION AND SYSTEM DEVELOPMENT**

**SUPPLEMENTAL REQUIRED CONTRACT PROVISIONS
FOR PROJECTS WITH FEDERAL AID**

I. PREVAILING WAGE RATES

The attached U.S. Department of Labor (Davis-Bacon Minimum Wage Rates) furnishes the minimum prevailing wage rates pursuant to the Davis-Bacon and Related Acts. The wage rates shown are the minimum rates required by the contract to be paid during its life, however 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 will be allowed or authorized on account of the payment of wage rates in excess of those listed herein.

II. COVERAGE OF TRUCK DRIVERS

Truck drivers are covered by Davis-Bacon Minimum Wage Rates in the following circumstances:

- Drivers of a contractor or subcontractor for time spent working on the site of the work.
- Drivers of a contractor or subcontractor for time spent loading and/or unloading materials and supplies on the site of the work, if such time is not de minimis.
https://www.dol.gov/whd/FOH/FOH_Ch15.pdf
- Truck drivers transporting materials or supplies between a facility that is deemed part of the site of the work and the actual construction site.
- Truck drivers transporting portions of the building or work between a site established specifically for the performance of the contract where a significant portion of such building or work is constructed and the physical place where the building or work called for in the contract will remain.

Truck drivers are not covered by Davis-Bacon Minimum Wage Rates in the following circumstances:

- Material delivery truck drivers while off the site of the work.
- Drivers of a contractor or subcontractor traveling between a Davis-Bacon job and a commercial supply facility while they are off the site of the work.”
- Truck drivers whose time spent on the site of the work is de minimis, such as only a few minutes at a time merely to pick up or drop off materials or supplies.

Details are available online at:

<https://www.dol.gov/whd/recovery/pwrb/Tab9.pdf>

<https://wisconsindot.gov/Pages/doing-bus/civil-rights/labornwage/trckng.aspx>

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. 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. RESOURCES

Required information regarding compliance with federal provisions is found in the following resources:

- FHWA-1273 included in this contract
- U.S. Department of Labor Prevailing Wage Resource Book
- U.S. Department of Labor Field Operations Handbook
- U.S. Code of Federal Regulations
- Any applicable law, Act, or Executive Order enacted by the federal government at the time of the letting of this contract

Superseded General Decision Number: WI20230010

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: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	<ul style="list-style-type: none">. Executive Order 14026 generally applies to the contract.. The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	<ul style="list-style-type: none">. Executive Order 13658 generally applies to the contract.. The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

1	01/26/2024
2	02/02/2024
3	02/16/2024
4	03/15/2024

BRWI0001-002 06/01/2023

CRAWFORD, JACKSON, JUNEAU, LA CROSSE, MONROE, TREMPPEALEAU, AND VERNON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.18	25.88

BRWI0002-002 06/01/2023

ASHLAND, BAYFIELD, DOUGLAS, AND IRON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 47.10	25.16

BRWI0002-005 06/01/2023

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...	\$ 39.97	25.02

BRWI0003-002 06/01/2023

BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, AND OCONTO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.00	26.06

BRWI0004-002 06/01/2023

KENOSHA, RACINE, AND WALWORTH COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 44.50	26.96

BRWI0006-002 06/01/2023

ADAMS, CLARK, FOREST, LANGLADE, LINCOLN, MARATHON, MENOMINEE, ONEIDA, PORTAGE, PRICE, TAYLOR, VILAS AND WOOD COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.08	25.98

BRWI0007-002 06/01/2023

GREEN, LAFAYETTE, AND ROCK COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.95	26.80

BRWI0008-002 06/05/2023		

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 44.96	25.67

BRWI0011-002 06/01/2023		

CALUMET, FOND DU LAC, MANITOWOC, AND SHEBOYGAN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.00	26.06

BRWI0019-002 06/01/2023		

BARRON, BUFFALO, BURNETT, CHIPPEWA, DUNN, EAU CLAIRE, PEPIN,
PIERCE, POLK, RUSK, ST. CROIX, SAWYER AND WASHBURN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 39.32	26.74

BRWI0034-002 06/01/2023		

COLUMBIA AND SAUK COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 41.56	26.19

CARP0068-011 05/02/2022		

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.....	\$ 41.19	27.05

CARP0264-003 06/05/2023		

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WAUKESHA, AND WASHINGTON
COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 41.91	29.72

CARP0310-002 06/05/2023		

ADAMS, ASHLAND, BAYFIELD (Eastern 2/3), FOREST, IRON, JUNEAU,
LANGLADE, LINCOLN, MARATHON, ONEIDA, PORTAGE, PRICE, SHAWANO

(Western Portion of the County), TAYLOR, VILAS, AND WOOD
COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
Piledriver.....	\$ 39.43	27.02

CARP0314-001 06/05/2023

COLUMBIA, DANE, DODGE, GRANT, GREEN, IOWA, JEFFERSON,
LAFAYETTE, RICHLAND, ROCK, SAUK, AND WALWORTH COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
Piledriver.....	\$ 39.43	27.02

CARP0361-004 05/01/2018

BAYFIELD (West of Hwy 63) AND DOUGLAS COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 36.15	20.43

CARP0731-002 06/05/2023

CALUMET (Eastern Portion of the County), FOND DU LAC (Eastern
Portion of the County), MANITOWOC, AND SHEBOYGAN COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
Piledriver.....	\$ 39.43	27.02

CARP0955-002 06/05/2023

CALUMET (Western Portion of the County), FOND DU LAC (Western
Portion of the County), GREEN LAKE, MARQUETTE, OUTAGAMIE,
WAUPACA, WAUSHARA, AND WINNEBAGO

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIVER.....	\$ 39.43	27.02

CARP1056-002 06/01/2023

ADAMS, ASHLAND, BARRON, BAYFIELD , BROWN, BUFFALO, BURNETT
, CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DANE, DODGE,
DOOR, DUNN, EAU CLAIRE, FLORENCE, FOND DU LAC, FOREST, GRANT,
GREEN, GREEN LAKE, IOWA, IRON, JACKSON, JEFFERSON, JUNEAU,
KEWAUNEE, LA CROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC,
MARATHON, MARINETTE, MARQUETTE, MENOMINEE, MONROE, OCONTO,
ONEIDA, OUTAGAMIE, PEPIN, PIERCE (E. of Hwy. 29 & 65), POLK (E.
of Hwy. 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
MILLWRIGHT.....	\$ 40.00	27.77

CARP1074-002 06/05/2023		

BARRON, BURNETT, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, PEPIN,
 PIERCE (E. of Hwy. 29 & 65), POLK (E. of Hwy. 35, 48 & 65),
 RUSK, SAWYER, ST. CROIX (E. of Hwy. 65), AND WASHBURN

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIVER.....	\$ 39.43	27.02

CARP1143-002 06/05/2023		

BUFFALO, CRAWFORD, JACKSON, LA CROSSE, MONROE, TREMPLEAU AND
 VERNON COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIVER.....	\$ 39.43	27.02

CARP1146-002 06/05/2023		

BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, MENOMINEE, OCONTO,
 AND SHAWANO (Western Portion of the County) COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIVER.....	\$ 39.43	27.02

CARP2337-009 06/05/2023		

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA

	Rates	Fringes
PILEDRIVERMAN.....	\$ 39.22	34.01

ELEC0014-002 11/26/2023		

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:.....	\$ 41.32	22.91

ELEC0014-007 05/28/2023		

REMAINING COUNTIES

	Rates	Fringes
Teledata System Installer Installer/Technician.....	\$ 29.82	17.70

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 06/01/2023

KENOSHA COUNTY

	Rates	Fringes
Electricians:.....	\$ 46.05	30%+13.15

ELEC0158-002 05/30/2021

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
ELECTRICIAN.....	\$ 36.14	29.75%+10.26

ELEC0159-003 05/30/2021

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
ELECTRICIAN.....	\$ 43.38	23.13

ELEC0219-004 06/01/2019

FLORENCE COUNTY (Townships of Aurora, Commonwealth, Fern, Florence and Homestead) AND MARINETTE COUNTY (Township of Niagara)

	Rates	Fringes
Electricians:		
Electrical contracts over \$180,000.....	\$ 33.94	21.80
Electrical contracts under \$180,000.....	\$ 31.75	21.73

ELEC0242-005 05/30/2021

DOUGLAS COUNTY

	Rates	Fringes
Electricians:.....	\$ 41.37	69.25%

ELEC0388-002 06/01/2023		

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:.....	\$ 38.74	26%+11.76

ELEC0430-002 06/01/2023		

RACINE COUNTY (Except Burlington Township)

	Rates	Fringes
Electricians:.....	\$ 46.70	25.02

ELEC0494-005 05/28/2023		

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Electricians:.....	\$ 47.75	26.72

ELEC0494-006 05/28/2023		

CALUMET (Township of New Holstein), DODGE (East of Hwy 26 including Chester Township), FOND DU LAC, MANITOWOC (Schleswig), and SHEBOYGAN COUNTIES

	Rates	Fringes
Electricians:.....	\$ 41.40	23.90

ELEC0494-013 05/28/2023		

DODGE (East of Hwy 26 including Chester Twp, excluding Emmet Twp), FOND DU LAC (Except Waupun), MILWAUKEE, OZAUKEE, MANITOWOC (Schleswig), WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Sound & Communications		
Installer.....	\$ 34.65	18.36
Technician.....	\$ 34.65	18.36

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 06/01/2023

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:.....	\$ 38.94	29.50%+10.00

 * ELEC0890-003 06/01/2023

DODGE (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE, RACINE (Burlington Township), ROCK AND WALWORTH COUNTIES

	Rates	Fringes
Electricians:.....	\$ 42.25	25.95%+11.63

 ELEC0953-001 06/02/2019

	Rates	Fringes
Line Construction:		
(1) Lineman.....	\$ 47.53	21.43
(2) Heavy Equipment Operator.....	\$ 42.78	19.80
(3) Equipment Operator.....	\$ 38.02	18.40
(4) Heavy Groundman Driver..	\$ 33.27	16.88
(5) Light Groundman Driver..	\$ 30.89	16.11
(6) Groundsman.....	\$ 26.14	14.60

 ENGI0139-005 06/01/2023

	Rates	Fringes
Power Equipment Operator		
Group 1.....	\$ 43.77	27.40
Group 2.....	\$ 43.27	27.40
Group 3.....	\$ 42.77	27.40
Group 4.....	\$ 42.51	27.40
Group 5.....	\$ 42.22	27.40
Group 6.....	\$ 36.32	27.40

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, day light machine

GROUP 6: Off-road material hauler with or without ejector.

BROWN, CALUMET, DOOR, FOND DU LAC, KEWAUNEE, MANITOWOC,
MARINETTE, OCONTO, OUTAGAMI, SHAWANO, SHEBOYGAN, AND WINNEBAGO
COUNTIES:

	Rates	Fringes
IRONWORKER.....	\$ 43.40	30.67

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor
Day, Thanksgiving Day & Christmas Day.

IRON0008-003 06/01/2023

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH (N.E. 2/3),
WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 41.73	30.67

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor
Day, Thanksgiving Day & Christmas Day.

IRON0383-001 06/01/2023

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.....	\$ 41.00	30.13

IRON0498-005 06/01/2023

GREEN (S.E. 1/3), ROCK (South of Edgerton and Milton), and
WALWORTH (S.W. 1/3) COUNTIES:

	Rates	Fringes
IRONWORKER.....	\$ 45.18	47.08

IRON0512-008 04/30/2023

BARRON, BUFFALO, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, JACKSON,
PEPIN, PIERCE, POLK, RUSK, ST CROIX, TAYLOR, AND TREMPLEAU
COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 43.00	34.11

IRON0512-021 04/30/2023

ASHLAND, BAYFIELD, BURNETT, DOUGLAS, IRON, LINCOLN, ONEIDA,

PRICE, SAWYER, VILAS AND WASHBURN COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 39.14	34.00

LAB00113-002 06/01/2023

MILWAUKEE AND WAUKESHA COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 33.56	23.86
Group 2.....	\$ 33.71	23.86
Group 3.....	\$ 33.91	23.86
Group 4.....	\$ 34.06	23.86
Group 5.....	\$ 34.21	23.86
Group 6.....	\$ 30.05	23.86

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

LAB00113-003 06/01/2023

OZAUKEE AND WASHINGTON COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 32.81	23.86
Group 2.....	\$ 32.91	23.86
Group 3.....	\$ 32.96	23.86
Group 4.....	\$ 33.16	23.86
Group 5.....	\$ 33.01	23.86
Group 6.....	\$ 29.90	23.86

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

LAB00113-011 06/01/2023

KENOSHA AND RACINE COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 32.62	23.86
Group 2.....	\$ 32.77	23.86
Group 3.....	\$ 32.97	23.86
Group 4.....	\$ 32.94	23.86
Group 5.....	\$ 33.27	23.86
Group 6.....	\$ 29.76	23.86

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

LAB00140-002 06/01/2023

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, TREMPÉALEAU, VERNON, VILLAS, WALWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 37.57	19.25
Group 2.....	\$ 37.67	19.25
Group 3.....	\$ 37.72	19.25
Group 4.....	\$ 37.92	19.25
Group 5.....	\$ 37.77	19.25
Group 6.....	\$ 34.20	19.25

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

LAB00464-003 06/01/2023

DANE COUNTY

	Rates	Fringes
LABORER		
Group 1.....	\$ 37.85	19.25
Group 2.....	\$ 37.95	19.25
Group 3.....	\$ 38.00	19.25
Group 4.....	\$ 38.20	19.25
Group 5.....	\$ 38.05	19.25
Group 6.....	\$ 34.20	19.25

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 05/01/2023

ASHLAND, BAYFIELD, BURNETT, AND DOUGLAS COUNTIES

	Rates	Fringes
Painters:		
New:		
Brush, Roller.....	\$ 34.59	24.84
Spray, Sandblast, Steel....	\$ 35.19	24.84
Repaint:		
Brush, Roller.....	\$ 33.09	24.84
Spray, Sandblast, Steel....	\$ 33.69	24.84

 PAIN0108-002 06/01/2023

RACINE COUNTY

	Rates	Fringes
Painters:		
Brush, Roller.....	\$ 41.04	21.95
Spray & Sandblast.....	\$ 42.04	21.95

 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 06/01/2023

JEFFERSON, MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
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Painters:

Bridge.....	\$ 39.84	24.86
Brush.....	\$ 39.09	24.86
Spray & Sandblast.....	\$ 39.84	24.86

PAIN0802-002 06/01/2023

COLUMBIA, DANE, DODGE, GRANT, GREEN, IOWA, LAFAYETTE, RICHLAND,
ROCK, AND SAUK COUNTIES

Rates Fringes

PAINTER

Brush.....	\$ 35.00	20.62
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PREMIUM PAY:

Structural Steel, Spray, Bridges = \$1.00 additional per
hour.

PAIN0802-003 06/01/2023

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.....	\$ 35.00	20.62
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PAIN0934-001 06/01/2022

KENOSHA AND WALWORTH COUNTIES

Rates Fringes

Painters:

Brush.....	\$ 36.70	24.69
Spray.....	\$ 37.70	24.69
Structural Steel.....	\$ 36.85	24.69

PAIN1011-002 06/06/2021

FLORENCE COUNTY

Rates Fringes

Painters:.....	\$ 26.71	14.38
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PLAS0599-002 06/01/2023

Rates Fringes

CEMENT MASON/CONCRETE FINISHER

Area A.....	\$ 45.17	27.27
Area B.....	\$ 39.97	25.02
Area C.....	\$ 40.40	25.25
Area D.....	\$ 41.16	24.49
Area E.....	\$ 40.50	25.14
Area F.....	\$ 36.98	28.67

AREA DESCRIPTIONS

AREA A: ASHLAND, BURNETT, BAYFIELD, DOUGLAS, IRON, PRICE, SAWYER, AND WASHBURN COUNTIES

AREA B: ADAMS, BARRON, BROWN, CALUMET, CHIPPEWA, CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE, FOND DU LAC, FOREST, GREEN LAKE, 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 C: BUFFALO, CRAWFORD, EAU CLAIRE, JACKSON, JUNEAU, LA CROSSE, MONROE, PEPIN, PIERCE, RICHLAND, TREMPLEAU, AND VERNON COUNTIES

AREA D: MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

AREA E: DANE, GRANT, GREEN, IOWA, LAFAYETTE, AND ROCK COUNTIES

AREA F: KENOSHA AND RACINE COUNTIES

TEAM0039-001 06/01/2023

	Rates	Fringes
TRUCK DRIVER		
1 & 2 Axles.....	\$ 35.57	26.09
3 or more Axles; Euclids, Dumpton & Articulated, Truck Mechanic.....	\$ 35.72	26.09

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 <https://www.dol.gov/agencies/whd/government-contracts>.

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) (iii)).

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 National Office because National Office has 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: WI20240015 03/15/2024

Superseded General Decision Number: WI20230015

State: Wisconsin

Construction Type: Heavy

Counties: Wisconsin Statewide.

HEAVY CONSTRUCTION PROJECTS (Excluding Tunnel, Sewer, and Water Lines).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/05/2024
1	01/26/2024

2 02/02/2024
 3 02/16/2024
 4 03/15/2024

BOIL0107-001 01/01/2021

	Rates	Fringes
BOILERMAKER		
Boilermaker.....	\$ 39.52	31.50
Small Boiler Repair (under 25,000 lbs/hr).....	\$ 26.91	16.00

BRWI0001-002 06/01/2023

CRAWFORD, JACKSON, JUNEAU, LA CROSSE, MONROE, TREMPPEALEAU, AND
 VERNON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.18	25.88

BRWI0002-002 06/01/2023

ASHLAND, BAYFIELD, DOUGLAS, AND IRON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 47.10	25.16

BRWI0002-005 06/01/2023

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...	\$ 39.97	25.02

BRWI0003-002 06/01/2023

BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, AND OCONTO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.00	26.06

BRWI0004-002 06/01/2023

KENOSHA, RACINE, AND WALWORTH COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 44.50	26.96

BRWI0006-002 06/01/2023

ADAMS, CLARK, FOREST, LANGLADE, LINCOLN, MARATHON, MENOMINEE,

ONEIDA, PORTAGE, PRICE, TAYLOR, VILAS AND WOOD COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.08	25.98

BRWI0007-002 06/01/2023		

GREEN, LAFAYETTE, AND ROCK COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.95	26.80

BRWI0008-002 06/05/2023		

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 44.96	25.67

BRWI0009-001 06/01/2023		

GREEN LAKE, MARQUETTE, OUTAGAMIE, SHAWANO, WAUPACA, WASHARA,
AND WINNEBAGO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.00	26.06

BRWI0011-002 06/01/2023		

CALUMET, FOND DU LAC, MANITOWOC, AND SHEBOYGAN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 40.00	26.06

BRWI0013-002 06/01/2023		

DANE, GRANT, IOWA, AND RICHLAND COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 41.56	26.19

BRWI0019-002 06/01/2023		

BARRON, BUFFALO, BURNETT, CHIPPEWA, DUNN, EAU CLAIRE, PEPIN,
PIERCE, POLK, RUSK, ST. CROIX, SAWYER AND WASHBURN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 39.32	26.74

BRWI0021-002 06/01/2023		

DODGE AND JEFFERSON COUNTIES

Rates	Fringes
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BRICKLAYER.....\$ 40.49 27.24

BRWI0034-002 06/01/2023

COLUMBIA AND SAUK COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 41.56	26.19

CARP0068-011 05/02/2022		

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.....	\$ 41.19	27.05

CARP0264-003 06/05/2023		

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WAUKESHA, AND WASHINGTON COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 41.91	29.72

CARP0310-002 06/05/2023		

ADAMS, ASHLAND, BAYFIELD (Eastern 2/3), FOREST, IRON, JUNEAU, LANGLADE, LINCOLN, MARATHON, ONEIDA, PORTAGE, PRICE, SHAWANO (Western Portion of the County), TAYLOR, VILAS, AND WOOD COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
Piledriver.....	\$ 39.43	27.02

CARP0314-001 06/05/2023		

COLUMBIA, DANE, DODGE, GRANT, GREEN, IOWA, JEFFERSON, LAFAYETTE, RICHLAND, ROCK, SAUK, AND WALWORTH COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
Piledriver.....	\$ 39.43	27.02

CARP0361-004 05/01/2018		

BAYFIELD (West of Hwy 63) AND DOUGLAS COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 36.15	20.43

CARP0731-002 06/05/2023		

CALUMET (Eastern Portion of the County), FOND DU LAC (Eastern

Portion of the County), MANITOWOC, AND SHEBOYGAN COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
Piledriver.....	\$ 39.43	27.02

CARP0955-002 06/05/2023

CALUMET (Western Portion of the County), FOND DU LAC (Western Portion of the County), GREEN LAKE, MARQUETTE, OUTAGAMIE, WAUPACA, WAUSHARA, AND WINNEBAGO

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIVER.....	\$ 39.43	27.02

CARP1056-002 06/01/2023

ADAMS, ASHLAND, BARRON, BAYFIELD , BROWN, BUFFALO, BURNETT , CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DANE, DODGE, DOOR, DUNN, EAU CLAIRE, FLORENCE, FOND DU LAC, FOREST, GRANT, GREEN, GREEN LAKE, IOWA, IRON, JACKSON, JEFFERSON, JUNEAU, KEWAUNEE, LA CROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, MONROE, OCONTO, ONEIDA, OUTAGAMIE, PEPIN, PIERCE (E. of Hwy. 29 & 65), POLK (E. of Hwy. 35, 48 & 65), PORTAGE, PRICE, RICHLAND, ROCK, RUSK, SAUK, SAWYER, SHAWANO, SHEBOYGAN, ST. CROIX (E. of Hwy. 65), TAYLOR, TREMPLEALEAU, VERNON, VILAS, WALWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
MILLWRIGHT.....	\$ 40.00	27.77

CARP1074-002 06/05/2023

BARRON, BURNETT, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, PEPIN, PIERCE (E. of Hwy. 29 & 65), POLK (E. of Hwy. 35, 48 & 65), RUSK, SAWYER, ST. CROIX (E. of Hwy. 65), AND WASHBURN

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIVER.....	\$ 39.43	27.02

CARP1143-002 06/05/2023

BUFFALO, CRAWFORD, JACKSON, LA CROSSE, MONROE, TREMPLEALEAU AND VERNON COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIVER.....	\$ 39.43	27.02

CARP1146-002 06/05/2023

BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, MENOMINEE, OCONTO,

AND SHAWANO (Western Portion of the County) COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 38.86	27.06
PILEDRIIVER.....	\$ 39.43	27.02

 CARP2337-009 06/05/2023

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA

	Rates	Fringes
PILEDRIVERMAN.....	\$ 39.22	34.01

 CARP2337-010 06/01/2023

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA

	Rates	Fringes
MILLWRIGHT.....	\$ 39.31	32.21

 ELEC0014-002 11/26/2023

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:.....	\$ 41.32	22.91

 ELEC0014-007 05/28/2023

REMAINING COUNTIES

	Rates	Fringes
Teledata System Installer Installer/Technician.....	\$ 29.82	17.70

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 06/01/2023

KENOSHA COUNTY

	Rates	Fringes
Electricians:.....	\$ 46.05	30%+13.15

 ELEC0158-002 05/30/2021

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
ELECTRICIAN.....	\$ 36.14	29.75%+10.26

ELEC0159-003 05/30/2021		

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
ELECTRICIAN.....	\$ 43.38	23.13

ELEC0219-004 06/01/2019		

FLORENCE COUNTY (Townships of Aurora, Commonwealth, Fern,
 Florence and Homestead) AND MARINETTE COUNTY (Township of
 Niagara)

	Rates	Fringes
Electricians:		
Electrical contracts over \$180,000.....	\$ 33.94	21.80
Electrical contracts under \$180,000.....	\$ 31.75	21.73

ELEC0242-005 05/30/2021		

DOUGLAS COUNTY

	Rates	Fringes
Electricians:.....	\$ 41.37	69.25%

ELEC0388-002 06/01/2023		

ADAMS, CLARK (Colby, Fremont, 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:.....	\$ 38.74	26%+11.76

ELEC0430-002 06/01/2023		

RACINE COUNTY (Except Burlington Township)

	Rates	Fringes
Electricians:.....	\$ 46.70	25.02

ELEC0494-005 05/28/2023		

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Electricians:.....	\$ 47.75	26.72

ELEC0494-006 05/28/2023		

CALUMET (Township of New Holstein), DODGE (East of Hwy 26 including Chester Township), FOND DU LAC, MANITOWOC (Schleswig), and SHEBOYGAN COUNTIES

	Rates	Fringes
Electricians:.....	\$ 41.40	23.90

ELEC0494-013 05/28/2023		

DODGE (East of Hwy 26 including Chester Twp, excluding Emmet Twp), FOND DU LAC (Except Waupun), MILWAUKEE, OZAUKEE, MANITOWOC (Schleswig), WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Sound & Communications		
Installer.....	\$ 34.65	18.36
Technician.....	\$ 34.65	18.36

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 06/01/2023

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:.....	\$ 38.94	29.50%+10.00

 * ELEC0890-003 06/01/2023

DODGE (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE,
 RACINE (Burlington Township), ROCK AND WALWORTH COUNTIES

	Rates	Fringes
Electricians:.....	\$ 42.25	25.95%+11.63

 ELEC0953-001 06/02/2019

	Rates	Fringes
Line Construction:		
(1) Lineman.....	\$ 47.53	21.43
(2) Heavy Equipment Operator.....	\$ 42.78	19.80
(3) Equipment Operator.....	\$ 38.02	18.40
(4) Heavy Groundman Driver..	\$ 33.27	16.88
(5) Light Groundman Driver..	\$ 30.89	16.11
(6) Groundsman.....	\$ 26.14	14.60

 ENGI0139-001 06/01/2023

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA
 COUNTIES

	Rates	Fringes
Power Equipment Operator		
Group 1.....	\$ 50.21	24.05
Group 2.....	\$ 49.71	24.05
Group 3.....	\$ 49.21	24.05
Group 4.....	\$ 48.37	24.05
Group 5.....	\$ 44.39	24.05
Group 6.....	\$ 39.24	24.05

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, 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; Gantry (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 06/05/2023

REMAINING COUNTIES

Rates

Fringes

Power Equipment Operator

Group 1.....	\$ 47.53	25.89
Group 2.....	\$ 46.28	25.89
Group 3.....	\$ 43.23	25.89
Group 4.....	\$ 42.70	25.89
Group 5.....	\$ 40.63	25.89
Group 6.....	\$ 39.10	25.89

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 06/01/2023

BROWN, CALUMET, DOOR, FOND DU LAC, KEWAUNEE, MANITOWOC, MARINETTE, OCONTO, OUTAGAMI, SHAWANO, SHEBOYGAN, AND WINNEBAGO COUNTIES:

	Rates	Fringes
IRONWORKER.....	\$ 43.40	30.67

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

 IRON0008-003 06/01/2023

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH (N.E. 2/3), WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 41.73	30.67

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

 IRON0383-001 06/01/2023

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.....	\$ 41.00	30.13

 IRON0512-008 04/30/2023

BARRON, BUFFALO, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, JACKSON, PEPIN, PIERCE, POLK, RUSK, ST CROIX, TAYLOR, AND TREMPLEAU COUNTIES

Rates	Fringes
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IRONWORKER.....\$ 43.00 34.11

 IRON0512-021 04/30/2023

ASHLAND, BAYFIELD, BURNETT, DOUGLAS, IRON, LINCOLN, ONEIDA,
 PRICE, SAWYER, VILAS AND WASHBURN COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 39.14	34.00

LABO0113-002 06/01/2023		

MILWAUKEE AND WAUKESHA COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 33.56	23.86
Group 2.....	\$ 33.71	23.86
Group 3.....	\$ 33.91	23.86
Group 4.....	\$ 34.06	23.86
Group 5.....	\$ 34.21	23.86
Group 6.....	\$ 30.05	23.86

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 06/01/2023

OZAUKEE AND WASHINGTON COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 32.81	23.86
Group 2.....	\$ 32.91	23.86
Group 3.....	\$ 32.96	23.86
Group 4.....	\$ 33.16	23.86
Group 5.....	\$ 33.01	23.86
Group 6.....	\$ 29.90	23.86

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

LAB00113-011 06/01/2023

KENOSHA AND RACINE COUNTIES

	Rates	Fringes
LABORER		
Group 1.....	\$ 32.62	23.86
Group 2.....	\$ 32.77	23.86
Group 3.....	\$ 32.97	23.86
Group 4.....	\$ 32.94	23.86
Group 5.....	\$ 33.27	23.86
Group 6.....	\$ 29.76	23.86

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

LAB00140-002 06/01/2023

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.....	\$ 37.57	19.25
Group 2.....	\$ 37.67	19.25
Group 3.....	\$ 37.72	19.25
Group 4.....	\$ 37.92	19.25
Group 5.....	\$ 37.77	19.25
Group 6.....	\$ 34.20	19.25

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

LAB00464-003 06/01/2023

DANE COUNTY

	Rates	Fringes
LABORER		
Group 1.....	\$ 37.85	19.25
Group 2.....	\$ 37.95	19.25
Group 3.....	\$ 38.00	19.25
Group 4.....	\$ 38.20	19.25
Group 5.....	\$ 38.05	19.25
Group 6.....	\$ 34.20	19.25

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 05/01/2023

ASHLAND, BAYFIELD, BURNETT, AND DOUGLAS COUNTIES

	Rates	Fringes
Painters:		
New:		
Brush, Roller.....	\$ 34.59	24.84
Spray, Sandblast, Steel....	\$ 35.19	24.84
Repaint:		
Brush, Roller.....	\$ 33.09	24.84
Spray, Sandblast, Steel....	\$ 33.69	24.84

 PAIN0108-002 06/01/2023

RACINE COUNTY

	Rates	Fringes
Painters:		
Brush, Roller.....	\$ 41.04	21.95
Spray & Sandblast.....	\$ 42.04	21.95

 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 06/01/2023

JEFFERSON, MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Painters:		
Bridge.....	\$ 39.84	24.86
Brush.....	\$ 39.09	24.86
Spray & Sandblast.....	\$ 39.84	24.86

PAIN0802-002 06/01/2023

COLUMBIA, DANE, DODGE, GRANT, GREEN, IOWA, LAFAYETTE, RICHLAND,
ROCK, AND SAUK COUNTIES

	Rates	Fringes
PAINTER		
Brush.....	\$ 35.00	20.62

PREMIUM PAY:
Structural Steel, Spray, Bridges = \$1.00 additional per
hour.

PAIN0802-003 06/01/2023

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.....	\$ 35.00	20.62

PAIN0934-001 06/01/2022

KENOSHA AND WALWORTH COUNTIES

	Rates	Fringes
Painters:		
Brush.....	\$ 36.70	24.69
Spray.....	\$ 37.70	24.69
Structural Steel.....	\$ 36.85	24.69

PAIN1011-002 06/06/2021

FLORENCE COUNTY

	Rates	Fringes
Painters:.....	\$ 26.71	14.38

PLAS0599-002 06/01/2023

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER		
Area A.....	\$ 45.17	27.27

Area B.....	\$ 39.97	25.02
Area C.....	\$ 40.40	25.25
Area D.....	\$ 41.16	24.49
Area E.....	\$ 40.50	25.14
Area F.....	\$ 36.98	28.67

AREA DESCRIPTIONS

AREA A: ASHLAND, BURNETT, BAYFIELD, DOUGLAS, IRON, PRICE, SAWYER, AND WASHBURN COUNTIES

AREA B: ADAMS, BARRON, BROWN, CALUMET, CHIPPEWA, CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE, FOND DU LAC, FOREST, GREEN LAKE, 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 C: BUFFALO, CRAWFORD, EAU CLAIRE, JACKSON, JUNEAU, LA CROSSE, MONROE, PEPIN, PIERCE, RICHLAND, TREMPLEAU, AND VERNON COUNTIES

AREA D: MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

AREA E: DANE, GRANT, GREEN, IOWA, LAFAYETTE, AND ROCK COUNTIES

AREA F: KENOSHA AND RACINE COUNTIES

 PLUM0011-003 05/01/2023

ASHLAND, BAYFIELD, BURNETT, DOUGLAS, IRON, SAWYER, AND WASHBURN COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 47.52	25.78

 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 05/28/2018

MARINETTE COUNTY (Niagara only)

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 33.33	24.48

PLUM0118-002 06/01/2023

KENOSHA, RACINE, AND WALWORTH COUNTIES

	Rates	Fringes
Plumber and Steamfitter.....	\$ 50.50	25.47

PLUM0400-003 05/29/2023

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.....	\$ 49.85	20.94

PLUM0434-002 05/28/2023

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.....	\$ 46.89	22.73

PLUM0601-003 06/01/2022

DODGE (Watertown), GREEN, JEFFERSON, LAFAYETTE, MILWAUKEE, OZAUKEE, ROCK, WASHINGTON AND WAUKESHA COUNTIES

	Rates	Fringes
PIPEFITTER.....	\$ 50.00	28.93

PLUM0601-009 06/01/2022

COLUMBIA, DANE, IOWA, MARQUETTE, RICHLAND AND SAUK COUNTIES

	Rates	Fringes
PIPEFITTER.....	\$ 52.06	26.86

TEAM0039-002 06/01/2023

	Rates	Fringes
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TRUCK DRIVER

1 & 2 Axle Trucks.....	\$ 35.57	26.09
3 or more axles; Euclids or Dumptor, Articulated Truck, Mechanic.....	\$ 35.72	26.09

* SUWI2011-001 11/16/2011

Rates Fringes

WELL DRILLER.....\$ 16.52 **

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====
 ** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.20) or 13658 (\$12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

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 <https://www.dol.gov/agencies/whd/government-contracts>.

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) (iii)).

 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 National Office because National Office has 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: WI20240001 01/19/2024

Superseded General Decision Number: WI20230001

State: Wisconsin

Construction Type: Building

Counties: Milwaukee, Ozaukee, Washington and Waukesha
Counties in Wisconsin.

BUILDING CONSTRUCTION PROJECTS (Does not include residential construction consisting of single family homes and apartments up to and including 4 stories)

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/05/2024
1	01/19/2024

ASBE0019-001 06/01/2023

	Rates	Fringes
Asbestos Removal worker/hazardous material handler		
Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging and disposing of all insulation materials from mechanical systems, whether they contain asbestos or not.....	\$ 42.80	36.10

BOIL0107-001 01/01/2021

	Rates	Fringes
BOILERMAKER		
Boilermaker.....	\$ 39.52	31.50
Small Boiler Repair (under 25,000 lbs/hr).....	\$ 26.91	16.00

BRWI0005-001 06/01/2023

	Rates	Fringes
TERRAZZO WORKER.....	\$ 40.00	24.93
TILE LAYER.....	\$ 39.00	24.93

BRWI0008-001 06/01/2023

	Rates	Fringes
BRICKLAYER.....	\$ 44.96	25.67

BRWI0008-003 06/01/2023

	Rates	Fringes
Marble Mason.....	\$ 44.96	25.67

CARP0264-001 06/05/2023

	Rates	Fringes
Carpenter & Soft Floor Layer (Including Acoustical work and Drywall hanging; Excluding Batt Insulation).....	\$ 41.91	29.72

CARP2337-002 06/01/2023

	Rates	Fringes
MILLWRIGHT.....	\$ 39.31	32.21

CARP2337-008 06/05/2023

	Rates	Fringes
PILEDRIVERMAN.....	\$ 39.22	34.01

 ELEC0494-001 05/28/2023

	Rates	Fringes
ELECTRICIAN.....	\$ 47.75	26.72

 ELEC0494-003 05/28/2023

	Rates	Fringes
Sound & Communications		
Installer.....	\$ 34.65	18.36
Technician.....	\$ 34.65	18.36

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

 ELEV0015-001 01/01/2023

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 56.97	37.335+a+b

FOOTNOTE:

- a. PAID VACATION: 8% of regular basic for employees with more than 5 years of service, and 6% for 6 months to 5 years of service.
- b. PAID HOLIDAYS: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

 ENGI0139-001 06/01/2023

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Power Equipment Operator		
Group 1.....	\$ 50.21	24.05
Group 2.....	\$ 49.71	24.05

Group 3.....	\$ 49.21	24.05
Group 4.....	\$ 48.37	24.05
Group 5.....	\$ 44.39	24.05
Group 6.....	\$ 39.24	24.05

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, 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, leads and/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

 IRON0008-005 06/01/2023

	Rates	Fringes
IRONWORKER.....	\$ 41.73	30.67

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

 LAB00113-001 06/05/2023

	Rates	Fringes
LABORER		
(1) General Laborer (Including Plaster Tender)..	\$ 37.48	22.25
(2) Air & Electric Equipment, Mortar Mixer, Scaffold Builder, Erector, and Swing Stage.....	\$ 37.61	22.25
(3) Jackhammer Operator, Gunnite Machine Man.....	\$ 37.76	22.25
(4) Caisson Worker - Topman.	\$ 37.85	22.25
(5) Construction Specialist.	\$ 38.07	22.25
(6) Nozzleman.....	\$ 38.11	22.25
(7) Caisson Work.....	\$ 38.26	22.25
(8) Barco Tamper.....	\$ 38.93	22.25

 LAB00113-010 06/05/2023

	Rates	Fringes
Asbestos Laborer Asbestos Abatement [Preparation, removal, and encapsulation of hazardous materials from non- mechanical systems].....	\$ 37.48	22.25

 PAIN0781-001 06/01/2023

Rates	Fringes
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Painters:

(1) Brush, Roller.....	\$ 39.09	24.86
(2) Spray & Sandblast.....	\$ 39.84	24.86
(3) Drywall Taper/Finisher..	\$ 39.44	24.86

PAIN1204-002 06/01/2023

	Rates	Fringes
GLAZIER.....	\$ 43.44	25.00

PLAS0599-004 06/05/2023

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 42.07	24.59

PLAS0599-005 06/05/2023

	Rates	Fringes
PLASTERER.....	\$ 39.98	25.81

PLUM0075-001 06/01/2021

	Rates	Fringes
PLUMBER (Including HVAC work)....	\$ 48.50	25.29

PLUM0601-001 06/01/2022

	Rates	Fringes
PIPEFITTER (Including HVAC work).....	\$ 50.00	28.93

* SFWI0183-001 01/01/2024

	Rates	Fringes
SPRINKLER FITTER.....	\$ 49.50	30.56

* SHEE0018-001 06/01/2023

	Rates	Fringes
Sheet Metal Worker (Including HVAC duct work and Technicians).....	\$ 53.03	28.58

TEAM0662-003 06/01/2023

	Rates	Fringes
TRUCK DRIVER		
1 & 2 Axles.....	\$ 35.57	26.09
3 or more Axles.....	\$ 35.72	26.09

* SUWI2002-002 01/23/2002

	Rates	Fringes
Asbestos Worker/Heat and Frost Insulator.....	\$ 25.36	8.37

Laborers:		
Concrete Worker.....	\$ 16.34 **	3.59
Landscape.....	\$ 8.73 **	8.40
ROOFER.....	\$ 18.01	3.28
Tile & Marble Finisher.....	\$ 13.89 **	7.43

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.20) or 13658 (\$12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

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 <https://www.dol.gov/agencies/whd/government-contracts>.

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) (iii)).

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).

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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.

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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.

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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 National Office because National Office has 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:

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Wage and Hour Division
U.S. Department of Labor
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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:

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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:

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Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

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.

If a project includes multiple types of construction, different wage rate determinations may be inserted into the contract (WI10/Highway = in all WisDOT highway contracts, WI15/Heavy = bridge over navigable water per USDOL and US Coast Guard designation, WI8/Heavy (Sewer & Water Line & Tunnel) = sanitary sewer and water main if the cost is more than 20% of the contract and/or at least \$1,000,000, and Building). If multiple wage rate determinations are inserted into the contract, use the classification in the wage determination for the work being done. Use WI15 wage rates when working on the bridge and/or structure from bank to bank. Use WI8 wage rates when working on any sanitary sewer or water main work. Use Building wage rates for all work done within the footprint of the building. Use WI10 wage rates for all other highway work in the contract and approaches to structures. For example, if a laborer is working within the footprint of a building, use the Laborer rate in the Building wage determination inserted in the contract. If a laborer is working on a bridge/structure within the banks, use the Laborer rate in the WI15/Heavy wage determination if inserted in the contract. If the laborer is working on the highway, use the Laborer rate in the WI10/Highway wage determination.



Proposal Schedule of Items

Proposal ID: 20240514013 Project(s): 2984-26-73

Federal ID(s): WISC 2024353

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	203.0211.S Abatement of Asbestos Containing Material (structure) 001. P-40-864	1.000 EACH	_____.	_____.
0004	203.0260 Removing Structure Over Waterway Minimal Debris (structure) 001. P-40-864	1.000 EACH	_____.	_____.
0006	204.0100 Removing Concrete Pavement	173.000 SY	_____.	_____.
0008	204.0120 Removing Asphaltic Surface Milling	370.000 SY	_____.	_____.
0010	204.0130 Removing Curb	150.000 LF	_____.	_____.
0012	204.0150 Removing Curb & Gutter	141.000 LF	_____.	_____.
0014	204.0155 Removing Concrete Sidewalk	289.000 SY	_____.	_____.
0016	204.0195 Removing Concrete Bases	8.000 EACH	_____.	_____.
0018	204.9060.S Removing (item description) 001. Poles	4.000 EACH	_____.	_____.
0020	204.9090.S Removing (item description) 001. Aerial Cable	175.000 LF	_____.	_____.
0022	205.0100 Excavation Common	193.000 CY	_____.	_____.
0024	206.1001 Excavation for Structures Bridges (structure) 001. P-40-864	1.000 EACH	_____.	_____.
0026	210.1500 Backfill Structure Type A	180.000 TON	_____.	_____.
0028	211.0101 Prepare Foundation for Asphaltic Paving (project) 001. 2984-26-73	1.000 EACH	_____.	_____.
0030	213.0100 Finishing Roadway (project) 001. 2984-26-73	1.000 EACH	_____.	_____.



Proposal Schedule of Items

Proposal ID: 20240514013 Project(s): 2984-26-73

Federal ID(s): WISC 2024353

SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0032	305.0120 Base Aggregate Dense 1 1/4-Inch	145.000 TON	_____.	_____.
0034	415.0410 Concrete Pavement Approach Slab	45.000 SY	_____.	_____.
0036	455.0605 Tack Coat	26.000 GAL	_____.	_____.
0038	465.0105 Asphaltic Surface	87.000 TON	_____.	_____.
0040	502.0100 Concrete Masonry Bridges	276.000 CY	_____.	_____.
0042	502.2000 Compression Joint Sealer Preformed Elastomeric (width) 001. 5/8-Inch	22.000 LF	_____.	_____.
0044	502.2000 Compression Joint Sealer Preformed Elastomeric (width) 002. 1-Inch	197.000 LF	_____.	_____.
0046	502.2000 Compression Joint Sealer Preformed Elastomeric (width) 003. 3-Inch	216.000 LF	_____.	_____.
0048	502.2000 Compression Joint Sealer Preformed Elastomeric (width) 004. 2-Inch	187.000 LF	_____.	_____.
0050	502.3200 Protective Surface Treatment	920.000 SY	_____.	_____.
0052	502.4106 Adhesive Anchors 3/4-inch	190.000 EACH	_____.	_____.
0054	502.4204 Adhesive Anchors No. 4 Bar	640.000 EACH	_____.	_____.
0056	502.4205 Adhesive Anchors No. 5 Bar	104.000 EACH	_____.	_____.
0058	502.4206 Adhesive Anchors No. 6 Bar	20.000 EACH	_____.	_____.
0060	505.0600 Bar Steel Reinforcement HS Coated Structures	59,540.000 LB	_____.	_____.



Proposal Schedule of Items

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SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0062	506.2610 Bearing Pads Elastomeric Laminated	26.000 EACH	_____.	_____.
0064	506.7050.S Removing Bearings (structure) 001. P-40-864	24.000 EACH	_____.	_____.
0066	509.1500 Concrete Surface Repair	527.000 SF	_____.	_____.
0068	509.9025.S Epoxy Injection Crack Repair	959.000 LF	_____.	_____.
0070	509.9026.S Cored Holes 2-Inch Diameter	16.000 EACH	_____.	_____.
0072	516.0500 Rubberized Membrane Waterproofing	54.000 SY	_____.	_____.
0074	517.0601 Painting Epoxy System (structure) 001. P-40-864	1.000 EACH	_____.	_____.
0076	517.0901.S Preparation and Coating of Top Flanges (structure) 001. P-40-864	1.000 EACH	_____.	_____.
0078	517.1010.S Concrete Staining (structure) 001. P-40-864	7,624.000 SF	_____.	_____.
0080	517.1801.S Structure Repainting Recycled Abrasive (structure) 001. P-40-864	1.000 EACH	_____.	_____.
0082	517.4501.S Negative Pressure Containment and Collection of Waste Materials (structure) 001. P-40-864	1.000 EACH	_____.	_____.
0084	517.6001.S Portable Decontamination Facility	1.000 EACH	_____.	_____.
0086	531.8990 Anchor Assemblies Poles on Structures	8.000 EACH	_____.	_____.
0088	601.0331 Concrete Curb & Gutter 31-Inch	208.000 LF	_____.	_____.



Proposal Schedule of Items

Proposal ID: 20240514013 Project(s): 2984-26-73

Federal ID(s): WISC 2024353

SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0090	602.0410 Concrete Sidewalk 5-Inch	2,651.000 SF	_____.	_____.
0092	602.0515 Curb Ramp Detectable Warning Field Natural Patina	20.000 SF	_____.	_____.
0094	602.0865 Concrete Driveway HES 7-Inch	24.000 SY	_____.	_____.
0096	606.0100 Riprap Light	133.000 CY	_____.	_____.
0098	616.0700.S Fence Safety	100.000 LF	_____.	_____.
0100	618.0100 Maintenance and Repair of Haul Roads (project) 001. 2984-26-73	1.000 EACH	_____.	_____.
0102	619.1000 Mobilization	1.000 EACH	_____.	_____.
0104	624.0100 Water	2.200 MGAL	_____.	_____.
0106	628.1905 Mobilizations Erosion Control	4.000 EACH	_____.	_____.
0108	628.1910 Mobilizations Emergency Erosion Control	2.000 EACH	_____.	_____.
0110	628.7010 Inlet Protection Type B	4.000 EACH	_____.	_____.
0112	631.0300 Sod Water	1.000 MGAL	_____.	_____.
0114	631.1000 Sod Lawn	10.000 SY	_____.	_____.
0116	638.2102 Moving Signs Type II	16.000 EACH	_____.	_____.
0118	638.2602 Removing Signs Type II	4.000 EACH	_____.	_____.
0120	642.5401 Field Office Type D	1.000 EACH	_____.	_____.



Proposal Schedule of Items

Proposal ID: 20240514013 Project(s): 2984-26-73

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SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0122	643.0410 Traffic Control Barricades Type II	3,750.000 DAY	_____.	_____.
0124	643.0420 Traffic Control Barricades Type III	3,224.000 DAY	_____.	_____.
0126	643.0705 Traffic Control Warning Lights Type A	3,660.000 DAY	_____.	_____.
0128	643.0900 Traffic Control Signs	26,794.000 DAY	_____.	_____.
0130	643.5000 Traffic Control	1.000 EACH	_____.	_____.
0132	644.1440 Temporary Pedestrian Surface Matting	300.000 SF	_____.	_____.
0134	644.1601 Temporary Pedestrian Curb Ramp	80.000 DAY	_____.	_____.
0136	644.1810 Temporary Pedestrian Barricade	90.000 LF	_____.	_____.
0138	646.1020 Marking Line Epoxy 4-Inch	921.000 LF	_____.	_____.
0140	646.5020 Marking Arrow Epoxy	2.000 EACH	_____.	_____.
0142	646.5220 Marking Symbol Epoxy	2.000 EACH	_____.	_____.
0144	646.6020 Marking Stop Line Epoxy 12-Inch	130.000 LF	_____.	_____.
0146	650.5000 Construction Staking Base	100.000 LF	_____.	_____.
0148	650.5500 Construction Staking Curb Gutter and Curb & Gutter	208.000 LF	_____.	_____.
0150	650.6501 Construction Staking Structure Layout (structure) 001. P-40-864	1.000 EACH	_____.	_____.



Proposal Schedule of Items

Proposal ID: 20240514013 Project(s): 2984-26-73

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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	650.8501 Construction Staking Electrical Installations (project) 001. 2984-26-73	1.000 EACH	_____.	_____.
0154	650.9000 Construction Staking Curb Ramps	2.000 EACH	_____.	_____.
0156	650.9911 Construction Staking Supplemental Control (project) 001. 2984-26-73	1.000 EACH	_____.	_____.
0158	652.0225 Conduit Rigid Nonmetallic Schedule 40 2-Inch	60.000 LF	_____.	_____.
0160	652.0235 Conduit Rigid Nonmetallic Schedule 40 3-Inch	550.000 LF	_____.	_____.
0162	653.0164 Pull Boxes Non-Conductive 24x42-Inch	16.000 EACH	_____.	_____.
0164	654.0105 Concrete Bases Type 5	10.000 EACH	_____.	_____.
0166	655.0610 Electrical Wire Lighting 12 AWG	384.000 LF	_____.	_____.
0168	655.0620 Electrical Wire Lighting 8 AWG	3,088.000 LF	_____.	_____.
0170	656.0201 Electrical Service Meter Breaker Pedestal (location) 001. West Abutment	2.000 EACH	_____.	_____.
0172	656.0201 Electrical Service Meter Breaker Pedestal (location) 002. East Abutment	2.000 EACH	_____.	_____.
0174	657.0255 Transformer Bases Breakaway 11 1/2-Inch Bolt Circle	6.000 EACH	_____.	_____.
0176	657.0322 Poles Type 5-Aluminum	6.000 EACH	_____.	_____.
0178	657.0610 Luminaire Arms Single Member 4 1/2-Inch Clamp 6-FT	6.000 EACH	_____.	_____.



Proposal Schedule of Items

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Federal ID(s): WISC 2024353

SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0180	659.5000.S Lamp, Ballast, LED, Switch Disposal by Contractor	4.000 EACH	_____.	_____.
0182	690.0150 Sawing Asphalt	97.000 LF	_____.	_____.
0184	690.0250 Sawing Concrete	538.000 LF	_____.	_____.
0186	715.0502 Incentive Strength Concrete Structures	1,862.000 DOL	1.00000	1,862.00
0188	715.0720 Incentive Compressive Strength Concrete Pavement	500.000 DOL	1.00000	500.00
0190	ASP.1T0A On-the-Job Training Apprentice at \$5.00/HR	7,800.000 HRS	5.00000	39,000.00
0192	ASP.1T0G On-the-Job Training Graduate at \$5.00/HR	15,000.000 HRS	5.00000	75,000.00
0194	SPV.0025 Special 001. Concrete Removal And Replacement At Machinery Floor	362.000 CF	_____.	_____.
0196	SPV.0025 Special 002. Counterweight Concrete Modification	26.000 CF	_____.	_____.
0198	SPV.0025 Special 003. Waterline Concrete Surface Repair	22.000 CF	_____.	_____.
0200	SPV.0060 Special 001. Bascule Girder Stiffener Angle Repairs	41.000 EACH	_____.	_____.
0202	SPV.0060 Special 002. Loading Girder Base Repairs	2.000 EACH	_____.	_____.
0204	SPV.0060 Special 003. Bascule Girder Trunnion Web Stiffener Replacements	24.000 EACH	_____.	_____.
0206	SPV.0060 Special 004. Uplift Column Base Repairs	9.000 EACH	_____.	_____.



Proposal Schedule of Items

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SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0208	SPV.0060 Special 005. Stiffener Replacements At Pinion Bearing Support	8.000 EACH	_____.	_____.
0210	SPV.0060 Special 006. Ladder And Railing Repairs	2.000 EACH	_____.	_____.
0212	SPV.0060 Special 007. Rivet Removal And Replacement	500.000 EACH	_____.	_____.
0214	SPV.0060 Special 008. Heel Block Refurbishment	4.000 EACH	_____.	_____.
0216	SPV.0060 Special 009. Machinery Enclosures	2.000 EACH	_____.	_____.
0218	SPV.0060 Special 010. Access Hatch	4.000 EACH	_____.	_____.
0220	SPV.0060 Special 011. Architectural Exterior Bridge Led Lighting	1.000 EACH	_____.	_____.
0222	SPV.0060 Special 012. Operator House Refurbishment	2.000 EACH	_____.	_____.
0224	SPV.0060 Special 013. Operator House Hvac	2.000 EACH	_____.	_____.
0226	SPV.0060 Special 014. Plumbing Systems	1.000 EACH	_____.	_____.
0228	SPV.0060 Special 015. Field Verification Survey	1.000 EACH	_____.	_____.
0230	SPV.0060 Special 016. Submarine Cable	1.000 EACH	_____.	_____.
0232	SPV.0060 Special 017. Temporary Support For Bascule Leaves	2.000 EACH	_____.	_____.
0234	SPV.0060 Special 018. Nameplate	1.000 EACH	_____.	_____.
0236	SPV.0060 Special 019. Counterweight Calculations And Span Balancing	1.000 EACH	_____.	_____.



Proposal Schedule of Items

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SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0238	SPV.0060 Special 020. Timber Fender Removal	1.000 EACH	_____.	_____.
0240	SPV.0060 Special 021. Fender Pier Repairs	1.000 EACH	_____.	_____.
0242	SPV.0060 Special 022. Span Drive Machinery Refurbishment	1.000 EACH	_____.	_____.
0244	SPV.0060 Special 023. Center Lock Machinery	1.000 EACH	_____.	_____.
0246	SPV.0060 Special 024. Trunnion And Trunnion Bearing Refurbishment	1.000 EACH	_____.	_____.
0248	SPV.0060 Special 025. Bridge Electrical Work	1.000 EACH	_____.	_____.
0250	SPV.0060 Special 026. Span Drives And Motors	1.000 EACH	_____.	_____.
0252	SPV.0060 Special 027. Control Console - Cherry Street	1.000 EACH	_____.	_____.
0254	SPV.0060 Special 028. PLC Controls - Cherry Street	1.000 EACH	_____.	_____.
0256	SPV.0060 Special 029. PLC And Communication Modifications - Knapp Street (Bridge B-40-62)	1.000 EACH	_____.	_____.
0258	SPV.0060 Special 030. Lightning And Surge Suppression	1.000 EACH	_____.	_____.
0260	SPV.0060 Special 031. Traffic Gates And Signals	4.000 EACH	_____.	_____.
0262	SPV.0060 Special 032. Power Distribution And Motor Control Center	1.000 EACH	_____.	_____.
0264	SPV.0060 Special 033. Limits And Sensors	1.000 EACH	_____.	_____.



Proposal Schedule of Items

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SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0266	SPV.0060 Special 034. Training, Manuals And Spare Parts	1.000 EACH	_____.	_____.
0268	SPV.0060 Special 035. Auxiliary Electrical Equipment	1.000 EACH	_____.	_____.
0270	SPV.0060 Special 036. Bent C Structural Steel Repairs	2.000 EACH	_____.	_____.
0272	SPV.0060 Special 037. Tree Protection	1.000 EACH	_____.	_____.
0274	SPV.0060 Special 038. Marking Yield Line Epoxy 36-inch	15.000 EACH	_____.	_____.
0276	SPV.0060 Special 039. Adjusting Sanitary Manhole Covers	2.000 EACH	_____.	_____.
0278	SPV.0060 Special 040. Luminaires Utility LED	6.000 EACH	_____.	_____.
0280	SPV.0060 Special 041. Salvage Existing Traffic Signal and Lighting Equipment	4.000 EACH	_____.	_____.
0282	SPV.0060 Special 042. Utility Line Opening (ULO)	10.000 EACH	_____.	_____.
0284	SPV.0060 Special 043. Milwaukee Light Base Type 1	4.000 EACH	_____.	_____.
0286	SPV.0060 Special 044. Equipment Grounding Electrode	12.000 EACH	_____.	_____.
0288	SPV.0060 Special 045. Installing City Furnished Poles Type 31-AL-BD	2.000 EACH	_____.	_____.
0290	SPV.0060 Special 046. Install Conduit Into Existing CUC Manhole	1.000 EACH	_____.	_____.



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SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0292	SPV.0060 Special 047. Submersible Multitap 3-Port Pre-Insulated Connector	2.000 EACH	_____.	_____.
0294	SPV.0060 Special 048. Fiberglass/Polymer Concrete Pull Box (13"X 24" X 24")	4.000 EACH	_____.	_____.
0296	SPV.0060 Special 049. Remove, Refurbish, and Reinstall Pedestrian Light Poles	4.000 EACH	_____.	_____.
0298	SPV.0085 Special 001. Bridge Structural Steel	330,820.000 LB	_____.	_____.
0300	SPV.0085 Special 002. Non-Structural Steel Ballast	78,640.000 LB	_____.	_____.
0302	SPV.0085 Special 003. Structural Steel Repair, Field Discovered Conditions Repaired as Directed	10,500.000 LB	_____.	_____.
0304	SPV.0090 Special 001. Two-Line Aluminum Railing	357.000 LF	_____.	_____.
0306	SPV.0090 Special 002. Pedestrian Railing Rehabilitation	875.000 LF	_____.	_____.
0308	SPV.0090 Special 003. Traffic Gate Railing	70.000 LF	_____.	_____.
0310	SPV.0090 Special 004. Marine Dock Fender	564.000 LF	_____.	_____.
0312	SPV.0090 Special 005. Fence Chain Link Polymer-Coated 10-FT, P-40-864	130.000 LF	_____.	_____.
0314	SPV.0090 Special 006. Steel Pipe Railing	65.000 LF	_____.	_____.
0316	SPV.0090 Special 007. Urethane Injection Crack Repair	52.000 LF	_____.	_____.
0318	SPV.0090 Special 008. Electrical Cable Type 4#8/1#8 XLP	1,200.000 LF	_____.	_____.



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SECTION: 0001 Contract Items

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0320	SPV.0090 Special 009. Marking Stop Line Epoxy 24-inch	28.000 LF	_____.	_____.
0322	SPV.0090 Special 010. 2-Duct Conduit Cement Encased Rigid Nonmetallic Conduit DB-60	100.000 LF	_____.	_____.
0324	SPV.0090 Special 011. Liquidtight Flexible Nonmetallic 1 ½-Inch Conduit	40.000 LF	_____.	_____.
0326	SPV.0165 Special 001. Steel Grid Floor 5-Inch	4,101.000 SF	_____.	_____.
0328	SPV.0165 Special 002. Concrete Fill For Grid Deck	1,430.000 SF	_____.	_____.
0330	SPV.0165 Special 003. Fiberglass Sidewalk Floor Plates	1,892.000 SF	_____.	_____.
Section: 0001			Total:	_____.
			Total Bid:	_____.

PLEASE ATTACH ADDENDA HERE