HIGHWAY WORK PROPOSAL

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

Proposal Number: 030

STATE ID	FEDERAL ID	PROJECT DESCRIPTION	HIGHWAY	COUNTY
4110-33-71	N/A	Main Street, City of Oshkosh, Fox River Bridge B-70-0056	USH 045	Winnebago

ADDENDUM REQUIRED

ATTACHED AT BACK

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

Proposal Guaranty Required: $100,000.00 Payable to: Wisconsin Department of Transportation	Attach Proposal Guaranty on back of this PAGE.
Bid Submittal Date: February 11, 2025 Time (Local Time): 11:00 am	Firm Name, Address, City, State, Zip Code **SAMPLE** **NOT FOR BIDDING PURPOSES**
Contract Completion Time April 17, 2026	
Assigned Disadvantaged Business Enterprise Goal 0%	This contract is exempt from federal oversight.

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

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

Subscribed and sworn to before me this date _____

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

Notary Seal

For Department Use Only

Type of Work:
Removals, Grading, Concrete Pavement, Structure Replacement / Rehabilitation, Curb and Gutter, Beam Guard, Erosion Control, Traffic Control, Pavement Marking, and Restoration.

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

The contractor is responsible for reviewing this web site for general notices as well as information regarding proposals in each letting. The department will also post special notices of all addenda to each proposal through this web site no later than 4:00 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://wisconsindot.gov/Pages/doing-bus/contractors/hcci/bid-let.aspx

or by calling the department at (608) 266-1631. Addenda can ONLY be obtained from the 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://wisconsindot.gov/Pages/doing-bus/contractors/hcci/bid-let.aspx

Use Expedite™ software to prepare and print the schedule of items. Provide a valid amount for all price fields. Follow instructions and review the help screens provided on the Bid Express™ web site to assure that the schedule of items is prepared properly.

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

Bidder Name
BN00
Proposals: 1, 12, 14, & 22

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

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

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

1. The check code printed on the bottom of the printout of the Expedite™ generated schedule of items is not the same on each page.
2. The check code printed on the printout of the Expedite™ generated schedule of items is not the same as the check code for that proposal provided on the diskette or CD ROM.
3. The diskette or CD ROM is not submitted at the time and place the department designates.

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

Wisconsin Department of Transportation

DT1303 1/2006

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

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

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

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

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

PRINCIPAL

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

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

(Company Name)

(Signature and Title)

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

(Signature of Attorney-in-Fact)

NOTARY FOR PRINCIPAL

(Date)

State of Wisconsin)
) ss.
_____ County)

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

(Signature, Notary Public, State of Wisconsin)

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

(Date Commission Expires)

Notary Seal

NOTARY FOR SURETY

(Date)

State of Wisconsin)
) ss.
_____ County)

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

(Signature, Notary Public, State of Wisconsin)

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

(Date Commission Expires)

Notary Seal

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

CERTIFICATE OF ANNUAL BID BOND

Wisconsin Department of Transportation

DT1305 8/2003

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

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

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

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

(Signature of Authorized Contractor Representative) (Date)

Effective with March 2010 Letting

LIST OF SUBCONTRACTORS

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

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

Name of Subcontractor	Class of Work	Estimated Value

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

Instructions for Certification

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Special Provisions

Table of Contents

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 4110-33-71; Main Street, City of Oshkosh; Fox River Bridge B-70-56; USH 45; Winnebago 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, 2025 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 (20240703)

2. Scope of Work.

The work under this contract consists of rehabilitation of the existing electrical, mechanical, hydraulic, and structural components of the bascule span, concrete overlay of the concrete deck, joint replacement, bridge painting, miscellaneous operator house upgrades 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 ten calendar days before the approved start date.

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

Do not begin work until September 2, 2025 unless otherwise authorized by the engineer.

The contract time for completion is based on an expedited work schedule and may require extraordinary forces and equipment.

The USH 45 Fox River Bridge shall remain operational based on the U.S. Coast Guard requirements for the 2026 navigation season; therefore, all work necessary to allow the lift bridge to be operational for navigation during the 2026 navigation season must be complete by April 17, 2026.

Obtain manufacturers' warranties or guarantees on equipment, materials, or products purchased for use on the contract are to be consistent with those provided as customary trade practice, and submit upon partial acceptance of the contract. Assign to the department all manufacturers' warranties or guarantees on all such equipment, material, or products furnished for or installed as part of the work.

Winter Maintenance

Snow may be plowed from the traveled roadway into the work site by the maintaining authority. Remove any snow from the work site that may be required to continue work operations.

Plowing any areas which may need to be cleared of snow or ice to accommodate changes in traffic control and to facilitate construction staging during winter months. Winnebago County or the local maintaining authority will not provide snow plowing operations in areas outside of the active traveled lanes.

Re-install or adjust any traffic control devices that may be damaged, removed, or shifted as part of normal winter maintenance operations. Clean and maintain traffic control devices as necessary or directed as a result of winter maintenance operations.

Anticipated locations of traffic control devices are shown in the plans. Review the work site with the engineer for locations where additional area may be available to maximize lane and shoulder widths over winter months to aid in winter maintenance operations and to maximize snow storage area. Adjust traffic control devices in these areas.

Snow plowing, ice removal including any road salt which may be required, maintenance and cleaning of traffic control devices, and other winter maintenance activities are incidental to other items of work under this contract.

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:

- B-70-56

Protection of Endangered Bats (Tree Clearing)

Northern long-eared bats (*Myotis septentrionalis*, or 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.

Amphibians and Reptiles

Any amphibians or reptiles that are found in the active work zone (which includes staging, storage, and parking areas within and adjacent to the project) shall be removed and relocated outside the active work zone. If there is an amphibian or reptile mortality, contact the following individuals immediately:

- WDNR Liaison - Jay Schiefelbein

  Phone: (920) 360-3784

  E-mail: jeremiah.schiefelbein@wisconsin.gov

- WisDOT Northeast Region Environmental Analysis & Review Specialist – Mae Sommerfeld

  Phone: (920) 492-5705

  E-mail: mae.sommerfeld@dot.wi.gov

If silt fence is utilized, install “j-hooks” or “small animal turn-arounds” at the ends of any silt fence installed per the WDNR’s reptile and amphibian exclusion protocols. Contact the WisDOT Project Manager, Bill Bertrand at (920) 360-3124 for information on the silt fence requirements.

FAA Notification

Notify the Wittman Regional Airport (OSH) at mailto:BOAHighwayCoordination@dot.wi.gov of the proposed project and expected construction schedule and equipment prior to beginning construction. A filing for construction equipment (e.g., crane), referencing Aeronautical Study Number (ASN) 2021-AGL-25834-OE, must be completed no less than 45 days prior to construction but is recommended by FAA to

be filed 4 to 6 months prior. The site elevation (water elevation) was recorded by the FAA at 747 feet above mean sea level. The height of the bascule span when fully open was estimated at 807 feet, or 60 feet above the site elevation (water level), or 45 feet above the bridge deck (762 feet).

United States Coast Guard

Coordinate with the United States Coast Guard (USCG) Ninth Coast Guard District at least fifteen (15) days prior to the start of any work that may alter the navigation clearance, places equipment in or over the waterway, or could potentially affect navigation during the project.

USCG Contact: Mr. Lee Soule

Phone: (216) 902-6085

E-mail: lee.d.soule@uscg.mil

US Coast Guard

Ninth Coast Guard District

1240 E 9th Street

Cleveland, OH 44199

Additionally, the contractor will be responsible for any and all fines placed against the department by the United States Coast Guard for not meeting waterway navigation requirements as provided in the article "Construction Over or Adjacent to Navigable Waters."

4. Traffic.

Keep US 45/Main Street between West 6th Avenue to Ceape Avenue open to vehicular and pedestrian traffic over the Fox River until 6:00 am, Tuesday, September 2, 2025. Anytime after 6:00 am, Tuesday, September 2, 2025, US 45/Main Street between West 6th Avenue to Ceape Avenue may be closed to vehicular and pedestrian traffic.

Provide emergency access within the construction limits at all times.

The proposed detour for northbound US 45 is via Main Street to West 9th Avenue to Oregon Street to Jackson Street to High Avenue.

The proposed detour for southbound US 45 is via Jackson Street to Oregon Street to West 9th Avenue to Main Street.

Pedestrian Access

Maintain pedestrian access between the Riverwalk and Ceape Avenue as shown in the plans for the pedestrian detour. When the Main Street Fox River Bridge is closed to traffic, sign and provide a pedestrian detour as shown in the plans.

Portable Changeable Message Signs – Message Prior Approval

After coordinating with department construction field staff, notify the Northeast Region Traffic Section at 920-366-8033 (secondary contact number is 920-360-3107) 3 business days before deploying or changing a message on a PCMS to obtain approval of the proposed message. The Northeast Region Traffic Unit will review the proposed message and either approve the message or make necessary changes.

PCMS boards must be deployed seven days before the closure of US 45/Main Street.

ner-643-035 (20171213)

Wisconsin Lane Closure System Advance Notification

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

TABLE 108-1 CLOSURE TYPE AND REQUIRED MINIMUM ADVANCE NOTIFICATION

Closure type with height, weight, or width restrictions (available width, all lanes in one direction < 16 feet)	**MINIMUM NOTIFICATION**
Lane and shoulder closures	7 calendar days
Full roadway closures	7 calendar days
Ramp closures	7 calendar days
Detours	7 calendar days
Closure type without height, weight, or width restrictions (available width, all lanes in one direction ≥ 16 feet)	**MINIMUM NOTIFICATION**
Shoulder Closures	3 calendar days
Lane closures	3 business days
Ramp closures	3 business days
Modifying all closure types	3 business days

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

5. 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 US 45 traffic, and entirely clear the traveled way and shoulders of such portions of the highway of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic, except those related to the closure of the Fox River Bridge (B-70-56), during the following holiday and special event periods:

- From 6:00 AM Thursday, November 27, 2025 to 6:00 AM Monday, December 1, 2025 for the Thanksgiving holiday;
- From 6:00 AM Wednesday, December 24, 2025 to 6:00 AM Monday, December 29, 2025 for Christmas;
- From 6:00 AM Wednesday, December 31, 2025 to 6:00 AM Monday, January 5, 2026 for the New Year holiday;
- From noon Friday, April 3, 2026 to 6:00 AM Monday, April 6, 2026 for the Easter holiday.

stp-107-005 (20210113)

6. Utilities.

This contract does not come under the provision of Administrative Rule Trans 220.

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

The scope of work for this contract has been determined to not impact, interfere or conflict with existing utilities within the contract limits. Notify the engineer of any potential utility conflicts. Coordinate with the engineer to adjust plans as needed to avoid any unanticipated utility conflicts.

stp-107-066 (20240703)

The following utility companies have facilities within the project area; however, no adjustments are anticipated:

ATC Management, Inc (electrical transmission)

City of Oshkosh (water)

City of Oshkosh (sewer)

Wisconsin Public Service Corporation (electric)

Wisconsin Public Service (gas/petroleum)

7. 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:

1. 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;
2. Drain all water from boats, trailers, bilges, live wells, coolers, bait buckets, engine compartments, and any other area where water may be trapped;
3. Inspect boat hulls, propellers, trailers and other surfaces. Scrape off any attached mussels, remove any aquatic plant materials (fragments, stems, leaves, seeds, or roots), and dispose of removed mussels and plant materials in a garbage can before leaving the area or invested waters; and
4. 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 (>104º F) application.

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

stp-107-055 (20130615)

8. Environmental Protection, Dewatering

Add the following to standard spec 107.18:

If dewatering is required, treat the water to remove suspended sediments by filtration, settlement or other appropriate best management practice before discharge. The means and methods proposed to be used during construction shall be submitted for approval as part of the Erosion Control Implementation Plan for dewatering at each location it is required. The submittal shall also include the details of how the intake will be managed to not cause an increase in the background level turbidity before treatment and any additional erosion controls necessary to prevent sediments from reaching the project limits or wetlands and waterways. Guidance on dewatering can be found on the Wisconsin Department of Natural Resources website located in the Storm Water Construction Technical Standards, Dewatering Code #1061, “Dewatering”. This document can be found at the WisDNR website:

http://dnr.wi.gov/topic/stormwater/standards/const_standards.html

The cost of all work and materials associated with water treatment and/or dewatering is incidental to the bid items the work is associated.

ner-107-040 (20180212)

9. Construction Over or Adjacent to Navigable Waters.

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

stp-107-060 (20171130)

Submit a contingency plan to the engineer prior to the start of construction. Include the names and telephone numbers of personnel and a list of equipment that will be available to correct any navigation problems that may arise during non-working hours.

Provide industry accepted measures and precautions to prevent accidental dropping of debris, sparks, flames, lighted or other damaging objects onto boats and water users passing beneath the bridge.

Ensure the rights and safety of the navigating public. Place appropriate warning signs and buoys upstream and downstream of the project site. According to the U.S. Coast Guard Standards, place marker lights on all watercraft and equipment that will remain moored, anchored, or otherwise floating on the waterway between dusk and dawn. Sign, mark, or light all other potential navigation hazards associated with the project including, but not limited to, construction machinery, rigging, and temporary structures. Provide water space with horizontal and vertical clearances to allow for safe public navigation through the construction site at all times. Payment for this accommodation is considered incidental to the contract work.

10. Erosion Control Structures.

Within three calendar days after completing the excavation for a substructure unit, place riprap or other permanent erosion control items required by the contract or deemed necessary by the engineer around the unit at a minimum to a height equivalent to the calculated water elevation resulting from a storm that occurs on the average of once every two years (Q2) as shown on the plan, or as the engineer directs.

In the event that construction activity does not disturb the existing ground below the Q2 elevation, the above timing requirements for permanent erosion control shall be waived.

stp-107-070 (20191121)

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

John Roelke, License Number AII-119523, inspected Structure B-70-56 for asbestos on June 28, 2021. No regulated Asbestos Containing Material (RACM) was found on this structure. A copy of the inspection report is available from Bill Bertrand, P.E., WisDOT Project Manager, (920) 360-3124, william.bertrand@dot.wi.gov.

stp-107-127 (20220628)

12. Notice to Contractor

City of Oshkosh (street lighting) has facilities within the conduits located in the sidewalks on both sides of the bridge structure (B-70-0056). The existing conduits are to be preserved and incorporated into the new work with the electrical and communication services within the conduits being maintained during construction. No adjustments are anticipated.

13. Coordination with Businesses

The contractor will arrange and conduct a meeting between the contractor, the department, local officials and business people to discuss the project schedule of operations including vehicular and pedestrian access during construction operations. Hold the first meeting 14 days prior to the start of work under this contract and no further meetings will be required unless directed by the engineer. The contractor shall notify all parties in writing a minimum of 10 days before the first meeting being held.

ner-105-005 (20180212)

14. Cleaning Decks to Reapply Concrete Masonry Overlay, Item 509.0505.S.

A Description

This special provision describes cleaning the entire bridge deck after the existing concrete masonry overlay is removed, prior to placing a new concrete masonry overlay.

B (Vacant)

C Construction

Blast-clean the entire surface of the deck, the vertical faces of curbs, sidewalks and parapets to the depth of the adjoining concrete overlay. Blast-clean all exposed existing reinforcing steel. Repair damage to existing epoxy-coated reinforcement remaining in place that is either uncovered by or damaged by the contractor's operations. Use engineer-approved patching or repair material compatible with the existing coating and inert in concrete.

Clean the surface on which the new concrete will be placed to remove all loose particles and dust by either brooming and water pressure using a high-pressure nozzle, or by water and air pressure. Use water for cleaning that conforms to standard spec 501.2.6.

D Measurement

The department will measure Cleaning Decks to Reapply Concrete Masonry Overlay by the square yard, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
509.0505.S	Cleaning Decks to Reapply Concrete Masonry Overlay	SY

Payment for is full compensation for cleaning the concrete surfaces.

stp-509-065 (20210708)

15. Polymer Overlay, Item 509.5100.S.

A Description

This special provision describes providing two layers of a two-component polymer overlay system to the bridge decks the plans show.

B Materials

B.1 General

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

B.2 Polymer Resin

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

Property	Requirements	Test Method
Gel Time[1]	15 - 45 minutes @ 73° to 75° F	ASTM C881
Viscosity[1]	7 - 70 poises	ASTM D2393, Brookfield RVT, Spindle No. 3, 20 rpm
Shore D Hardness[2]	60-75	ASTM D2240
Absorption[2]	1% maximum at 24 hr	ASTM D570
Tensile Elongation[2]	30% - 70% @ 7 days	ASTM D638

Property	Requirements	Test Method
Tensile Strength[2]	2000 to 5000 psi @ 7 days	ASTM D638
Chloride Permeability[2]	<100 coulombs @ 28 days	AASHTO T277

[1] Uncured, mixed polymer binder

[2] Cured, mixed polymer binder

Ensure that the polymer resin when mixed with aggregate has the following properties:

Property	Requirement[1]	Test Method
Minimum Compressive Strength	1,000 psi @ 8 hrs 5,000 psi @ 24 hrs	ASTM C579 Method B, Modified[2]
Thermal Compatibility	No Delaminations	ASTM C884
Minimum Pull-off Strength	250 psi @ 24 hrs	ASTM C1583

[1] Based on samples cured or aged and tested at 75°F

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

B.3 Aggregates

Furnish natural or synthetic aggregate that is non-polishing; clean; free of surface moisture; fractured or angular in shape; free from silt, clay, asphalt, or other organic materials; and conform to the following:

Aggregate Properties

Property	Requirement	Test Method
Moisture Content[1]	1/2 of the measured aggregate absorption, %	ASTM C566
Hardness	$\geq$6.5	Mohs Scale
Fractured Faces	100% with at least 1 fractured face & 80% with at least 2 fractured faces of material retained on No.16	ASTM D5821
Absorption	$\leq$1%	ASTM C128

[1] Sampled and tested by the department before placement.

Gradation

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

B.4 Approval of Bridge Deck Polymer Overlay System

A minimum of 20 working days before application, submit product data sheets and specifications from the manufacturer, and a certified report of test or analysis from an independent laboratory to the engineer for approval. The department will sample and test the aggregates for gradation and moisture content before placement. If requested, supply the department with samples of the polymer for the purpose of acceptance testing.

B.4.1 Product Data Sheets and Specifications

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

B.4.2 Certified Report of Test or Analysis

Conform to the following:

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

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

C Construction

C.1 General

Ensure that the overlay system is 1/4 inch thick or thicker.

Conform to the following:

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

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

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

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

C.2 Deck Preparation

C.2.1 Deck Repair

Remove all asphaltic patches and unsound or disintegrated areas of the concrete decks as the plans show, or as the engineer directs. Work performed to remove and repair the concrete deck will be paid for under other items.

Use deck patching products that are compatible with the overlay system. Patching materials with magnesium phosphate shall not be used. Place patches after surface is prepared via shot blasting and cleaning as described in Section C.2.2 of this specification. Portland cement concrete patches shall be used for joint repairs and full depth deck repairs with a plan area larger than 4 sf, unless approved otherwise by the Structures Design Section. If rapid-set concrete is used, place patches per the manufacturer's recommendation. If Portland cement concrete is used, place patches per standard spec 509.3.9.1.

Deck patching shall be filled and properly finished prior to overlay placement. Do not place overlay less than 1 hour, or per the manufacturer's recommendation, after placing rapid-set concrete patches in the repair areas. Do not place overlay less than 28 days after placing Portland cement concrete patches in the repair areas.

C.2.2 Surface Preparation

Determine an acceptable shotblasting machine operation (size of shot, flow of shot, forward speed, and/or number of passes) that provides a surface profile meeting CSP 5 (medium-heavy shotblast) according to the ICRI Technical Guideline No. 310.2. If the engineer requires additional verification of the surface preparation, test the tensile bond strength according to ASTM C1593. The surface preparation will be considered acceptable if the tensile bond strength is greater than or equal to 250 psi or the failure area at a depth of 1/4 inches or more is greater than 50 percent of the test area. Continue adjustment of the shotblasting machine and necessary testing until the surface is acceptable to the engineer or a passing test result is obtained.

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

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

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

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

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

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

C.2.3 Transitional Area

If the plans show, create a transitional area approaching transverse expansion joints and ends of the deck using an approved mechanical or blasting method. Remove 1/4 inch to 5/16 inch of concrete adjacent to the joint or end of deck and taper a distance of 3 feet.

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

C.3 Overlay Application

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

1. Ambient air temperature is below 50 F or above 100 F.
2. Deck temperature is below 50 F.
3. Moisture content in the deck exceeds 4.5 percent when measured by an electronic moisture meter or shows visible moisture after 2 hours when measured according to ASTM D4263.
4. Rain is forecasted during the minimum curing periods listed under C.5.
5. Materials component temperatures below 65 F or above 99 F.
6. Concrete deck age is less than 28 days.
7. The deck temperature exceeds 100 F.
8. If the gel time is 10 minutes or less at the predicted high air temperature for the day.

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

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

After completion of each course, cure the overlay according to the manufacturer’s instructions. Follow the minimum cure times listed under C.5 or as prescribed by the manufacturer. Remove the excess aggregate from the surface treatment by sweeping, blowing, or vacuuming without tearing or damaging the surface; the material may be re-used if approved by the engineer and manufacturer. Apply all courses

of the overlay system before opening the area to traffic. Do not allow equipment or traffic on the treated area until directed by the engineer.

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

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

C.4 Application Rates

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

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

[1] The minimum total applications rate is 7.5 GAL/100 SF.

[2] Application of aggregate shall be of sufficient quantity to completely cover the polymer.

C.5 Minimum Curing Periods

As a minimum, cure the coating as follows:

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

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

C.6 Repair of Polymer Overlay

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

D Measurement

The department will measure Polymer Overlay by the square yard, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
509.5100.S	Polymer Overlay	SY

Payment is full compensation for preparing the surface; for tensile bond testing; for creating the transitional area; for providing the overlay; for cleanup; and for sweeping/vacuuming and disposing of excess materials.

The department will pay separately for deck repairs.

stp-509-030 (20200629)

16. Removing Concrete Masonry Deck Overlay B-70-56, Item 509.9005.S.

A Description

This special provision describes removing concrete bridge deck overlays by milling the entire bridge deck as the plans show.

Conform to standard spec 204 as modified in this special provision.

B (Vacant)

C Construction

C.1 Milling

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

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

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

1. Is free of sharp protrusions;
2. Removes a minimum of 1/4 inch of the original concrete deck or slab, or to a depth the plans show:
3. Has uniform transverse grooves that measure up to 1/4 inch vertically and transversely; and
4. If applicable, is acceptable to the manufacturer of the sheet waterproof membrane.

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

D Measurement

The department will measure Removing Concrete Masonry Deck Overlay B-70-56 by the square yard, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
509.9005.S	Removing Concrete Masonry Deck Overlay B-70-56	SY

Payment is full compensation for removing the concrete masonry; and for properly disposing of all materials.

stp-509-005 (20210113)

17. Removing Polymer Overlay B-70-56, Item 509.9015.S.

A Description

This special provision describes removing the polymer overlay. Perform work conforming to standard spec 204.

B (Vacant)

C Construction

Remove the overlay by scraping, grinding, milling, or other approved method without damaging the underlying concrete. Submit removal procedures to the engineer for approval before beginning. Do not remove more than 1/4"of the existing concrete surface. Leave a uniform textured finish over the entire concrete surface.

D Measurement

The department will measure Removing Polymer Overlay B-70-56 by the square yard, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
509.9015.S	Removing Polymer Overlay B-70-56	SY

Payment for is full compensation for removing the polymer; and for properly disposing of all materials.

stp-509-015 (20210113)

18. 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)

19. Preparation and Coating of Top Flanges B-70-56, 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 (Structure #) 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 B-70-56	EACH

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

stp-517-010 (20210708)

20. Structure Repainting Recycled Abrasive B-70-56, 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:

1. Structure B-70-56 23,602 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 595. 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/cm^2, continue to clean the affected areas until results are below the specified limit. Submit anticipated testing frequencies and chloride remediation methods to the engineer for review and approval.

Apply the prime coat the same day that the metal surfaces receive the No. 10 blast or re-blast before application. Cleaned surfaces shall be of the specified condition immediately 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 Recycle Abrasive Structure and the paint system being used.

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

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

D Measurement

The department will measure Structure Repainting Recycled Abrasive (Structure #) 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 B-70-0056	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)

21. Structure Overcoating Cleaning and Priming B-70-56, Item 517.3001.S.

A Description

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

A.1 Areas to be Cleaned and Painted

Structure B-70-56

1. Two Coat Area: 0 SF with SP 1 cleaning.
2. Three Coat Area:

   0 SF with SP 2 cleaning.

   690 SF with SP 3 cleaning.

   0 SF with SP 11 cleaning.

   0 SF with SP 15 cleaning.

   690 SF total three-coat area.

B Materials

Furnish an epoxy coating system from the department's APL for Paint- structure maintenance.

C Construction

C.1 Surface Preparation

Before overcoating or power tool cleaning, solvent clean all surfaces to be coated according to SSPC-SP1. A SSPC-SP 3 power Tool Cleaning according to Steel Structures Painting Council Specification 3 will be required on all metal surfaces to be painted with a three-coat system. Prime the same day, or re-clean before application, all metal surfaces receiving a No. 3 cleaning.

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

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

C.2 Painting

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

C.3 Coating Application

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

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

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

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

D Measurement

The department will measure Structure Overcoating Cleaning and Priming (Structure #) 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
517.3001.S	Structure Overcoating Cleaning and Priming B-70-56	EACH

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

stp-517-036 (20210708)

22. Negative Pressure Containment and Collection of Waste Materials, B-70-56, 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 (Structure) 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 B-70-56	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)

23. 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)

24. Labeling and Disposal of Waste Material.

The EPA ID number for Structure B-70-56 is WIR000111955.

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://wisconsindot.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:

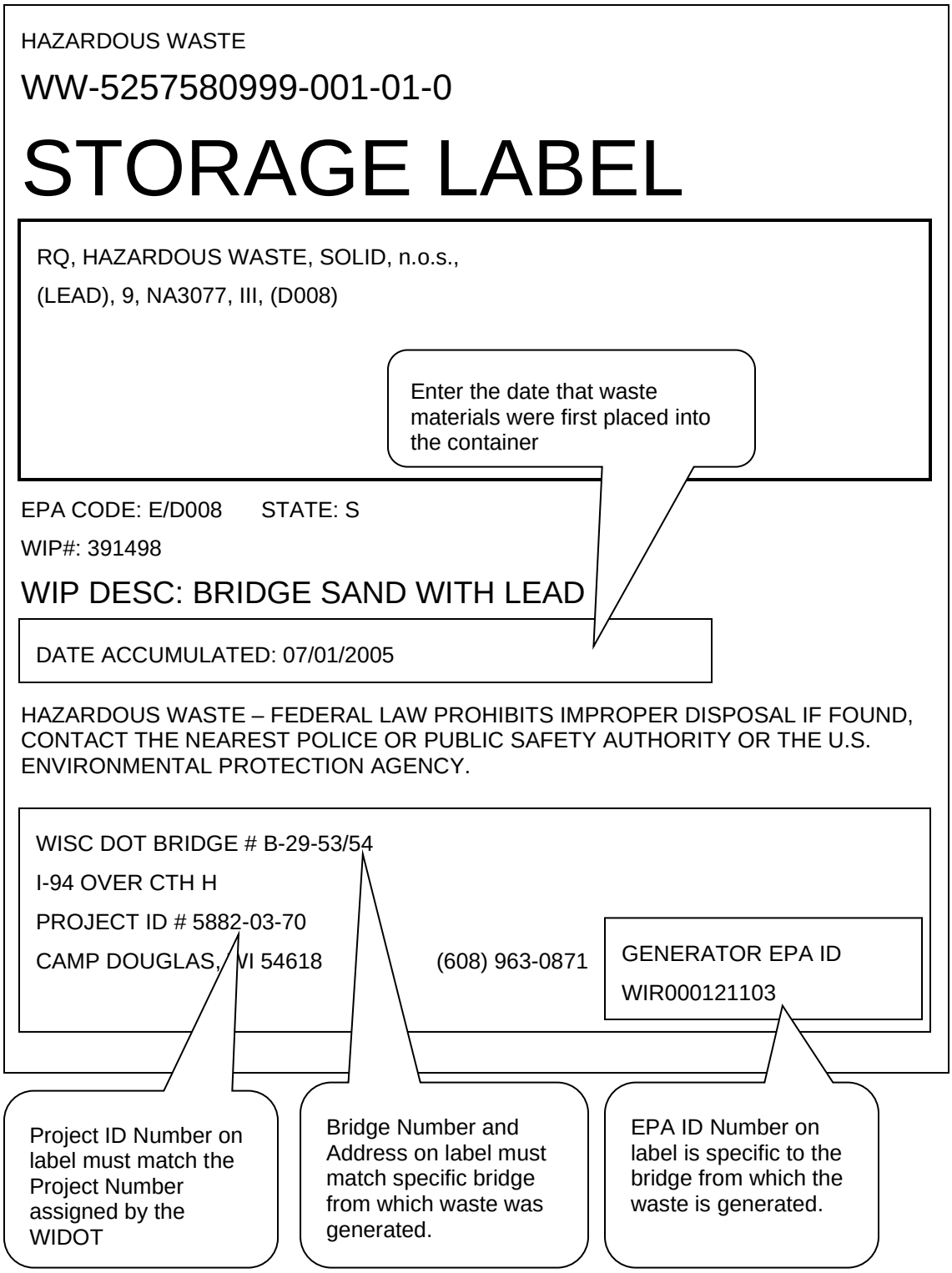
https://wisconsindot.gov/Documents/doing-bus/eng-consultants/cnslt-rsrces/environment/hazwaste-contacts.pdf

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)



25. Traffic Control

Perform this work conforming to standard spec 643, and as the plans show, or as the engineer approves, except as follows.

Submit to engineer for approval a detailed traffic control plan for any changes to the proposed traffic control detail as the plans show. Submit this plan 10 days before the preconstruction conference.

The turning of traffic control devices when not in use to obscure the message will not be allowed under this contract.

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

Conduct operations in such a manner that causes the least interference and inconvenience to the free flow of vehicles on the roadways. This includes the following:

Do not park or store any vehicle, piece of equipment, or construction materials on the right-of-way, unless otherwise specified in the traffic control article or without approval of the engineer.

All construction vehicles and equipment entering or leaving live traffic lanes shall yield to through traffic.

Equip all vehicles and equipment entering or leaving the live traffic lanes with a hazard identification beam (flashing yellow signal) capable of being visible on a sunny day when viewed without the sun directly on or behind the device from a distance of 1000 feet. Activate the beam when merging into or exiting a live traffic lane.

Do not disturb, remove or obliterate any traffic control signs, advisory signs, shoulder delineators or beam guard in place along the traveled roadways without the approval of the engineer. Immediately repair or replace any damage done to the above during the construction operations at contractor expense.

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

ner-643-065 (20190410)

26. Bridge Electrical Work, Item SPV.0060.01.

A Description

This special provision describes furnishing and installing bridge electrical equipment as the plans show and conforming to this special provision.

A.1 General

Under this item, furnish, install, test, and place in satisfactory operating condition the rehabilitated electrical components of the Main Street bascule bridge. Include new HPU electric motors, disconnect switches, power monitor, new proportional valve controllers, new HPU enclosure lighting, control console top with data-logging HMI equipment, PLC modifications, field start-up service, spare parts, and all required provisions for interlocking, complete with all accessories as specified herein and as shown on the plans.

Remove the existing electrical components shown on the plans. Carefully remove the existing control components and deliver them to the department at the direction of the engineer.

Furnish any apparatus, device, circuit, appliance, material, or labor not specifically mentioned or included herein, but found necessary to complete or perfect the installation and equipment in a manner acceptable to the engineer, without extra cost to the department.

A.2 Reference Standards

Consider portions or all of certain recognized industry or association standards referred to herein as being a requirement of these specifications as binding as though reproduced in full herein unless supplemented and/or modified by more stringent requirements in this specification. Unless otherwise stated, use the reference standard that is current as of the date of issuance of these specifications. Refer to standards either by full name or, for the sake of brevity, by letter designation as follows:

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute, Inc.
ASME	American Society of Mechanical Engineers
AWG	American Wire Gauge
EPA	Environmental Protection Agency
IES	Illuminating Engineering Society
ICEA	Insulated Cable Engineer's Association

JIC	Joint Industrial Council
NEC	National Electrical Code of NFPA
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
UL	Underwriters' Laboratories, Inc.

A.3 Permits and Codes

Comply with the National Electrical Code and all applicable laws and ordinances in effect at the construction site, as well as the regulations of the utility companies furnishing power and telephone services to the site for the electrical installation.

Obtain approval from the Coast Guard for any temporary construction navigation lighting required and marine closures.

File a certificate of final electrical inspection and acceptance by the Board of Fire Underwriters or an approved inspection agency with the engineer.

A.4 Drawings and Specifications

A.4.1 General

Do not allow omissions from the drawings and specifications or the mis-description of work details that are evidently necessary to carry out the intent of the drawings and specifications, or that are customarily performed, to relieve the contractor from performing such omissions and details. Perform them as if fully and correctly set forth and described in the drawings and specifications. Submit any case of discrepancy in figures, catalog numbers, or descriptions in the drawings or specifications to the engineer, who shall promptly make a determination in writing. Make any adjustments in the plans by the contractor only with written approval or do so at the contractor's own risk and expense.

A.4.2 Equipment Locations

Consider the layout drawings as illustrative, showing the general arrangements and location of all equipment, and subject to the approval of the engineer. Modify the layout as necessary for complete and proper construction and operation. Treat the location of the conduits, boxes, and equipment shown on the plan as diagrammatic only, subject to shifting as required or as directed by the engineer to conform to local conditions. Utilize the design drawings in the preparation of the shop or as-built drawings showing the permanent construction as actually made.

A.5 Shop Drawings

Within 90 days after executing the contract, submit shop drawings to the engineer. Provide full-size drawings for items requiring construction from such drawings and descriptive leaflets for standard catalog items that are mass-produced.

Submit shop drawings for all cabinet enclosures, motors, panel boards, span brakes, transformers, switches, raceways, conductors, wiring devices, lighting fixtures, lamps, service equipment, boxes, control equipment, fasteners, and methods of fastening to structures. Do not purchase any equipment without approval of shop drawings. Ensure the control system vendor reviews, coordinates, and prepares all shop drawings related to the bridge operating control system before submitting them to the engineer for review.

Include manufacturer’s test data in shop drawings, certify them by the manufacturer, and identify the application for which they are proposed. Ensure equipment identification matches the drawings. Mark standard drawings showing more than one model or size to indicate the model or size proposed.

Include the following in shop drawings of cabinets containing electrical equipment: outside dimensions, areas for conduit penetrations, one-line and three-line diagrams, wiring diagrams, schematic and interconnection diagrams, terminal block arrangements and numbers (if terminal blocks are intended for connection of field wiring), and operating instructions. Provide layout drawings and geographic wiring diagrams for the control console and programmable controller cabinets.

Submit shop drawings when installation and mounting details of switches, fixtures, and devices differ from or are not specifically detailed on the drawings. If requested by the engineer, submit samples of proposed substitute items at no additional cost to the department. Submit all support data in quintuplicate

for checking. The department and the engineer are not liable for materials purchased, work done, or delays incurred before their review. The contractor remains responsible for unsatisfactory materials even if not noted by the engineer upon receipt. Deliver manufacturers' guarantees or warranties on materials to the engineer upon receipt.

Use standard 11 in. x 17 in. sheets for working drawings. Submit catalog cuts and manufacturers' standard drawings on their respective standard sizes to the engineer for review and distribution. The engineer is not responsible for errors in working drawings, even if approved, or for quantities or bills of material included. The contractor retains full responsibility for the safe and adequate execution of the work per the plans and specifications, despite any uncorrected errors in working drawings or implied approval by the engineer.

Do not make changes after the engineer reviews the working drawings without resubmitting for approval. Clearly mark and date all subsequent changes or revisions.

Before final payment, deliver two sets of as-built drawings reflecting all changes or modifications made from the contract drawings related to the finished structure. One set will be given to the department. Ensure as-built drawings are suitable for permanent storage; any reproducible material subject to fading when exposed to light is not acceptable.

A.6 Quality Assurance

A.6.1 Standard Products

Provide materials and equipment that are essentially the standard catalogued product of manufacturers regularly engaged in production of those materials or equipment and are manufacturer's latest standard design that complies with these Detailed Requirements. Provide materials and equipment that are essentially duplicate items that have been in satisfactory commercial or industrial use at least two years prior to bid opening. Where two units of the same class of equipment are required, provide products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. Provide the manufacturer's name and address and the model and serial number on a nameplate, securely affixed in a conspicuous place for each major component. The nameplate of the distributing agent will not be acceptable.

A.6.2 Manufacturer’s Recommendations

Furnish printed copies of the manufacturer's installation recommendations to the engineer prior to installation when required. Do not proceed with the installation of the item until the recommendations are received. Failure to furnish these recommendations can result in the rejection of the material. Provide all special machining and installation required by the component manufacturer as part of the work.

A.6.3 Rules, Regulations and Ordinances

Ensure that work complies with all applicable Federal, State, and Local rules, regulations, and ordinances. In the event of a conflict between these specifications and the above-mentioned codes, standards, rules, regulations, and ordinances, apply the most stringent requirement.

A.6.4 Substitutions

The terms "approved equal", "of equal quality", and "or equal" which appear on the plans and in these Special Provisions, are intended to allow the contractor to substitute other manufacturers and model numbers of products of equal quality and rating for those specified.

Prior to the ordering of any substitute product, obtain in writing the engineer's approval of the equivalence of the substitute product. The acceptance of the substitute product is at the sole discretion of the engineer who will establish the basis for equivalence and will review the quality of the materials and products described in detail on the submitted shop drawings and product data.

The engineer will return submissions for substitute material marked "Approved" or "Revise and Resubmit." Upon return of a submission marked "Revise and Resubmit," return the submission showing the specified product. Rejection or acceptance of a proposed substitute will not in any way result in additional cost to the department, or in additional contract time.

Approval by the engineer of any substitute product submitted by the contractor does not relieve the contractor of responsibility for the proper operation, performance, or functioning of that product.

A manufacturer’s name and catalog part number specifying a particular product, whether in these Special Provisions or on the plans, is so specified to establish quality, configuration, and arrangement of parts. An equivalent product made by another manufacturer may be substituted for the specified product subject to the approval of the engineer; however, make all necessary changes required by the

substitution in related machinery and structural, architectural, and electrical parts, at no additional cost to the department.

If any departures from the plans or these Special Provisions are deemed necessary by the contractor, submit details of those departures and the reasons therefore, as soon as practicable for approval. Make no such departures without approval by the engineer.

A.7 Operation and Maintenance Manuals (Electrical)

A.7.1 General Requirements for Manuals

Include an electrical chapter to the Operations and Maintenance Manuals required under the General Machinery Special Provision. The requirements from that special provision apply to the electrical chapter. The requirements provided herein only apply to new equipment being provided as part of this work.

Provide an electronic copy of the documents specified herein on the control console HMI displays. Make the documents easily accessible from the display provided.

A.7.2 First Booklet

The first booklet contains the following:

(1) Table of Contents.

(2) Operator's Instructions, which covers in full the step-by-step sequence of operation of the bridge and its auxiliaries, and notes all precautions required for correct operation. Include complete instructions for the following:

   a. Emergency manual operation

   b. Main Automatic System

(3) Detailed maintenance instructions for adjusting, lubricating, and operating all of the electrical equipment provided, including manufacturer's recommended preventative maintenance lubrication schedule.

(4) A set of descriptive leaflets, bulletins, and drawings covering all items of equipment and apparatus provided during the scope of work. The catalog number of each piece, to be used in case it becomes necessary to order replacement parts from the manufacturer. Furnish this information for all electrical equipment such as motors, switches, circuit breakers, relays, cables, etc.

(5) A troubleshooting flow chart for troubleshooting the bridge electrical system to facilitate the diagnosing and correcting of malfunctions.

(6) Instructions for diagnosing malfunctions of the programmable control system and for detecting failures in the external controls connected thereto.

(7) Test data, equipment, criteria, and performance curves for all main motors.

(8) Names, addresses and telephone numbers of vendors and suppliers.

(9) Copies of all warranties on equipment supplied to the project.

A.7.3 Second Booklet

The second booklet contains the following:

(1) Legible reduced size photostatic copies of drawings corrected to show the work as constructed:

(2) The complete spare parts list.

(3) All as-built schematics and wiring diagrams for all new equipment provided.

(4) The control console and control panel layouts and wiring diagrams for all modified equipment.

(5) A comprehensive schedule of electrical apparatus installed under this work.

(6) All submitted final as-built shop drawings for items installed or modified under this work.

(7) All as-built conduit layout and installation drawings for work performed.

(8) PLC schematic wiring, relay logic, PLC input/output hardwire diagram, PLC logic and PLC ladder diagrams.

B Materials

B.1 General

Provide the Electrical Equipment and its installation according to regulations of the NEC and conforming to Division II, Group B of the latest revision, for movable bridges of the American Association of State Highway and Transportation Officials (AASHTO) Design Specifications except as otherwise provided herein.

Provide all materials and equipment furnished under these specifications new and, to the extent possible, standard products of the various manufacturers. Where more than one of any specific item is required, all shall be of the same type and manufacturer. Provide items of equipment or material which are not specifically defined herein conforming to the general standard of quality established by these specifications.

Provide each piece of electrical equipment and apparatus with a permanent type corrosion- resisting metal nameplate on which is stamped the name of the manufacturer, the catalog or model number, and the rating or capacity of the equipment or apparatus.

Identity all electrical devices, printed circuit boards, including their components, and any other electrical or electronic parts in such a way as to be easily procured from a supplier of that device. Provide all prints and drawings of same showing complete circuitry and identify all components as to their specific use and function in the circuit.

Retain the services of a qualified control system integrator who has complete system responsibility for the detailed integration of all system components, in order to ensure a complete operating system is furnished and installed according to specified requirements of this project. The control system integrator shall be responsible for ensuring total compatibility of all equipment and devices furnished and installed and shall provide supervisory assistance in the selection, installation and integration of all bridge control system and associated equipment. Components associated with bridge control system include but are not limited to control console, switchboard cabinet, relay cabinet, remote control console, programmable controllers, modems, computer and interfacing equipment and other facilities as may be required.

The control system integrator is responsible for the review of shop drawings, prior to submission to the engineer, to ensure that all components of the bridge operating system submitted for use are compatible in every respect and that all components meet or exceed the specific requirements and intent of the project. The total bridge operating system is subject to the approval of the engineer, based on the specified project requirements.

The control system integrator shall ensure maximum reliability and ease of maintenance for all components of the operating system and shall be responsible for all training of the bridge operator staff and for the supervision of all trial operations. The system integrator must have demonstrable competence in providing electrical control systems for movable bridges of various types, particularly bascule types, but including vertical lift and swing type bridges utilizing programmable logic controllers and Ethernet communications. Such competence shall be demonstrated by identifying a minimum of (3) three movable bridges for which he has provided complete systems within the past five years.

The control system vendor shall be of a caliber and background similar to that of Faith Technologies APC Group, Menaska, WI, (920) 783 1500; Pieper Power, New Berlin, WI, (414) 462-7700; Panatrol Corp, Burr Ridge, IL, (630) 655-4700; or approved equal.

Make available system integrator field service staff with the capability of providing services for field coordination of construction and final adjustments to the control system and the remote control operation to the satisfaction of the engineer. Provide the capability of field staff responding at the site to an emergency within 24 hours.

Include the name and written qualifications of the proposed system vendor in the bid proposal for review and approval by the engineer.

Provide ferrous metal work that is hot-dip galvanized according to ASTM A123 or ASTM A153, whichever is applicable. Refinish any damaged galvanized metal work by cleaning and painting with two coats of approved galvanizing repair paint, or approved zinc chromium paint.

Provide lock washers on all mechanical fastenings.

To prevent deterioration due to corrosion, provide all bolts, nuts, studs, washers, pins, terminals, springs, hangers, cap screws, set screws, tap bolts, brackets, and other hardware fastenings and fittings of an approved corrosion-resisting material such as silicon bronze, or stainless steel. Hot-dip galvanizing, per ASTM Specification A-153, will be considered approved treatment for all non-moving ferrous hardware.

B.2 HPU Main and Filtering Motors

Furnish motors built according to NEMA standards. Protect all exposed metal surfaces with a moisture-proof corrosion-resistant polyester paint or coating. Provide a heavy-duty corrosion- resistant material for exposed unpainted and uncoated metal surfaces. Balance the rotors mechanically and electrically. Provide all windings with special insulation to retard decrease in insulation resistance due to excessive moisture. Provide Class H insulation for each motor.

Install the motors with approved sizes and types of wire terminals and splice fittings for the connection of the motors to the circuit wiring. Furnish each motor with a cast-iron frame, bearing brackets with re-lubrication fittings and conduit connection box.

Provide hydraulic pump motors, unless otherwise specified or indicated on the plans, having a horsepower of 1/3 HP or larger, 480 volt, 3-phase, 60-Hertz, totally enclosed, non-ventilated, continuous duty rated, squirrel cage induction motor.

Provide motors with horsepower as shown on the plans. Where motors are supplied as an integral part of another item, provide motors of a NEMA design and speed compatible with that item.

Where alternate equipment is used, provide actual motor horsepower at least 115 percent of the driven load.

B.3 Power Monitoring

Provide power monitoring on the MCC. Provide a current transformer and voltage tap on each phase and ground. This shall be fed to a power monitor on the MCC. The power monitor shall be capable of transmitting the information to be displayed on the control console mounted HMI. Provide a power monitor rated for 120VAC input power with power supplied internally in the MCC. Monitor the following:

Kilowatt, kilovolt-ampere, Kilo-var

Voltage values for each phase

Current values for each phase

Kilowatt-hour, kilovolt-ampere-hour

Total Harmonic Distortion metering

Ground Fault/Ground Loss

The meter shall transmit the above items through an ethernet network to the HMI located on the control console to display.

B.4 Rotary Cam Limit Switch

Each rotary cam-operated limit switch shall be housed in a NEMA 4X, stainless steel, enclosure and shall be driven by gearing furnished with the operating machinery, which shall rotate the input shaft. The span limit switches must have 8 circuits individually micro-adjustable and provisions for internal vernier adjustments. The limit switch shall allow for a ±1/4-degree contact operation repeatability. Ensure each contact of the limit switch is double pole double throw (DPDT) precision-type, snap-action switch. The switch contacts must have a minimum AC inductive continuous current carrying rating of 10 A and a minimum DC resistive continuous current carrying rating of 10 A. Ensure each limit switch is Ametek Series 1980R.

The rotary cam must house both the cam-operated limit switches and resolver. Ensure resolvers are heavy duty NEMA 4X rated. Ensure the resolver is capable of outputting an analog 4-20 mA signal to the span position indication meters or the PLCs as required. Ensure the resolver is rated for 24 VDC input voltage. Mount the resolver in the internal housing. Verify before ordering the equipment the rotation of the rotary cam limit switch so that the output increases with the appropriate shaft rotation. Verify the number of turns required to display full scale and choose the appropriate resolver. Ensure the connection between the resolver and the wiring is through a side mounted military standard (MS) connector. Ensure the wiring for the resolver is 2 twisted shielded pairs (TSP) #16 AWG (for a total of 4 conductors). Ensure the resolver is an AMETEK or approved equal.

B.5 Proportional Valve Controller

Provide a new multi-functional digital control amplifier for electromagnetic proportional valves. The controller is to allow for the control of pressure and flow rate via a current supplied by the PLC. The controller shall be 24VDC, provide at least 2 relay contacts, and be configurable via a PC connection.

The new controller is to be part ERD-PA5D6-D2-20 by Nachi.

B.6 Disconnect Switches

Provide disconnect switches rated as shown on plans, but in no instance rated for less than 30 A. Disconnect switches in the machinery rooms, pier areas, track level, and any equipment outside of the control house shall be of the heavy-duty type NEMA 4X Type 316 Stainless steel enclosures. All other disconnect switches in conditioned spaces shall be NEMA 12. Disconnect switches shall be UL listed and according to NEMA KS 1 and UL 98.

Disconnect switches shall be supplied with auxiliary contacts that open when the disconnect switch is in the open position. The auxiliary contacts shall feed the heater circuit for the motors and PLC inputs. The contacts shall be rated at a minimum of 10 A.

The operating mechanism for heavy-duty disconnect switches shall be a quick make, quick break mechanism such that, during normal operation of the switch, the operation of the contacts cannot be restrained by the operating handle after the closing or opening action of the contacts has started. The disconnect switch operating handle shall be an integral part of the box, not the cover. The disconnect switch shall have provisions for padlocking the switch in the OFF position with at least three padlocks being provided. The handle position shall travel at least 90 degrees between OFF and ON positions to clearly distinguish and indicate handle position.

All heavy-duty disconnect switches shall have a dual cover interlock mechanism to prevent unintentional opening of the switch cover when the switch is ON and to prevent turning the switch ON when the cover is open. The cover interlock mechanism shall have an externally operated override, but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

Disconnect switches shall be by Schneider Electric or approved equals by Eaton or Siemens.

B.7 Combination Starters

Furnish and install new combination starter disconnect switches for new filtering pump motors. Motors are to rated as shown on the plans. Pump shall be automatically operated by the PLC control system from a local motor starter NEMA 12 enclosure with a START/STOP control mounted on the front cover located in the HPU enclosure.

Combination disconnect switches shall be by Schneider Electric or approved equals by Eaton or Siemens.

B.8 Control Console

The existing control console body will remain. Furnish and install new control console top and upper display enclosure according to the Plans. The new console top and display enclosure shall be fabricated from no. 10 gauge type 302 stainless steel with a non-glare, satin finish. All metal hardware shall be of substantial construction and shall have a satin chrome finish. All equipment mounting screws and bolts shall be stainless steel.

Two local operator interface displays (HMIs) will be provided to display system status and diagnostics. Communication to the PLC will be via ethernet. The operator interfaces must be color flat screens with a 19" touch screens. Programming configuration software required to modify the screens must be provided with the system. The operator interface will be mounted indoors and shall be in a NEMA 4/12 rated enclosure conforming to the requirements specified hereinbefore for bridge control cabinets. The HMIs shall be Nematron IPC or engineer approved equal.

New pushbuttons and control switches not from the original system, shall be heavy-duty, oil-tight, contact blocks operated by glove handle selector knobs, key switches and push-button operators as indicated on the Plans. Contacts shall be fine silver, capable of interrupting 6 amperes at 120 volts AC, and of continuously carrying 10 amperes. Switches and pushbuttons shall be Square D class 9001, type K, NEMA 4 or approved equal by Allen Bradley or Schneider Electric.

Indicating lights shall be heavy-duty, oil-tight pilot lights with one or two fields as required as per the plans. They shall be provided with LED lamps the color of the lamp lens and shall be rated at 120 VAC. Where group testing cannot be accomplished through the PLC the lights shall be provided with a push to test feature. All lenses shall be plastic, with color and marking as shown on the Plans.

Joysticks with the ability to have 6 points per directions shall be provided. The joysticks will be provided with contacts rated for up to 8 amps and 1000 VAC. The joysticks will be used for manual control of the hydraulics system. Joysticks to be by Romeo Joysticks by TER or approved equal.

B.9 Raceways

B.9.1 General

All conduit shall be of the material called for in the plans. All conduits shall be free from blisters, cracks, or injurious defects.

Wiring troughs (wireways) shall be NEMA 12 rated.

Conduits embedded in concrete shall be Galvanized Rigid Steel Conduit or Rigid Nonmetallic Conduit, upon approval from the State.

B.9.2 Galvanized Rigid Steel Conduit

Galvanized rigid steel conduit where specified is to 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, Wheatland Tube, Western Tube, or approved equal.

All rigid steel conduit fittings shall be hot-dip galvanized after fabrication according to ASTM-A153. Manufacturer shall be Emerson Appleton Electric, Eaton Crouse-Hinds, Emerson O.Z./Gedney, Amphenol Pyle-National, ABB Russell & Stroll, ABB 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.

90-degree conduit pulling elbows (LB fittings) shall be provided on the opposite side of concrete penetrations that occur in controlled environments as shown on the plans. The fitting shall be by Emerson Appleton Electric, Eaton Crouse-Hinds, EmersonO.Z./Gedney, or approved equal.

B.9.3 PVC Coated Galvanized Rigid Steel Conduit

PVC coated galvanized rigid conduit where specified will 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 Coating on the Conduit shall conform in all respects to the NEMA RN-1 Standard.

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 KorKap or approved equal by Calbond 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.

90-degree conduit pulling elbows (LB fittings) shall be provided on the opposite side of concrete penetrations that occur in outdoor environments as shown on the plans. The fitting shall be by manufacturer KorKap or approved equal by Calbond or Rob-Roy.

B.9.4 Liquid-tight Flexible Metal Conduit

Liquid-tight flexible steel conduit shall be constructed of a flexible galvanized steel core made from continuous steel metal and an extruded PVC cover. Conduit shall be Anaconda SEALTITE Type UA, Electri-Flex Liquatite Type LA, Encore Wire Type LA, or approved equal.

Fittings shall have insulated throat and be UL labeled. An "O" ring assembly shall be used on each fitting. Manufacturers shall be Emerson Appleton Electric, Eaton Cooper Industries, ABB Thomas & Betts, or approved equal.

B.9.5 Rigid Nonmetallic Conduit

Rigid Nonmetallic Conduit shall be rigid polyvinyl chloride, schedule 80, 90 degree C, of the sizes indicated on the plans and shall conform to the NEMA standards. Conduit shall be UL listed in conformity with Article 347 of the National Electric Code. Conduit, fittings, and cement shall be produced by the same manufacturer who shall have had at least five year's experience in manufacturing these products. All joints shall be solvent welded according to the recommendation of the manufacturer. Manufacturers shall be Allied, Eaton Cooper Industries.

B.9.6 Wireways

Wireways shall conform to NEMA Standards for wireways. Installation of wireways are to be installed within the control tower only and are not permitted in the pier areas or in outdoor locations and shall be of the size indicated on the plans. Wireways shall be NEMA 12 rated and constructed from 14 gauge steel. Access covers shall be of the hinge/screw type to permit easy access to lay in cables. Wireways shall be finished with ANSI 61 gray polyester power coating both inside and out over phosphatized surfaces.

Wireways shall be an acceptable alternative to conduit and junction boxes shown on the plans when proper coordination and equipment clearances are met. The interconnections of the sections, fittings and other components shall provide a rigid mechanical assembly with splice plates properly installed to avoid structural weakness. Locate wireway splices at the ¼ points of the span between supports.

Wireways shall run parallel or perpendicular to the main structural lines of the building. Wireways shall be mechanically connected at joints, fittings, and terminations, and shall provide a continuous ground path.

Support wireways trays at the midpoint of each horizontal bend and according to manufacturer's recommendations.

Installation of wireways shall conform NEC Article 376.

B.10 Conductors and Cables

B.10.1 General

Furnish insulated conductors and conductor accessories in sufficient quantities for a complete installation. Installation shall be according to the National Electrical Code, and shall include placement, splicing, terminating, identification, testing, and verification of each circuit and conductor.

Provide cable types as shown on the plans.

The "Outside Diameter" is the nominal diameter used to calculate the required conduit size. If actual cables used are of larger diameter, increase the size of the affected conduits, as required by the NEC, at no additional cost to the department.

B.10.2 Building Wire

Conductors shall be stranded copper with 600V rated insulation surface marked with manufacturers name or trademark, conductor size, insulation type and UL label. Number of conductors shall be as required, including a bare ground conductor.

Conform to NEMA/ICEA WC 70/S-95-658 and UL 44 for type XHHW and XHHW-2 insulation.

B.10.3 Multi-Conductor Power Cable

Conductors shall be stranded copper with 600V rated insulation surface marked with manufacturers name or trademark, conductor size, insulation type and UL label. Number of conductors shall be as indicated on the drawings, including a bare ground conductor. Cable shall be suitable for outdoor, wet locations.

Individual conductor color coding shall be by the ICEA Method 4. When exposed to sunlight, UL Listed and marked as sunlight resistant. Cable shall conform to NFPA 70 Type TC.

Conform to NEMA/ICEA WC 70/S-95-658 and UL 44 and UL 1277 for type XHHW-2 insulation with an overall PVC jacket.

B.10.4 Multi-Conductor Control Cable

Conductors shall be stranded copper with 600V rated insulation surface marked with manufacturers name or trademark, conductor size, insulation type and UL label. Number of conductors shall be as required, including a bare ground conductor. Cable shall be suitable for outdoor, wet locations.

Number of conductors shall be as indicated on the drawings, provided with or without bare ground conductor of the same AWG size. When a bare ground conductor is not provided, an additional insulated conductor shall be provided and used as the ground conductor (e.g., 6/c #14 w/g and 7/c #14 are equal). Individual conductor color coding shall be by NEMA/ICEA Method 1, Table E-2. When exposed to sunlight, UL listed and marked as sunlight resistant. Cable shall conform to NFPA 70 Type TC.

Conform to NEMA/ICEA WC 57/S-73-532 and UL 44 and UL 1277 for type XHHW-2 insulation with an overall PVC jacket.

B.10.5 Instrumentation Cable

Conductors shall be stranded copper with 600V rated PVC insulation with PVC jacket. The conductors shall be surface marked with manufacturers name or trademark, conductor size, insulation type and UL label. Number of conductors shall be as required, including a bare ground conductor. When exposed to sunlight, UL listed and marked as sunlight resistant. Individual conductor color coding shall be by ICEA Method 1, Table K-1. Cable shall be suitable for cable tray use when installed in cable tray. Cable shall be suitable for outdoor, wet locations.

Twisted pair(s) or triad(s) shall have 100 percent aluminum-polyester foil shield coverage with stranded drain wire.

Conform to UL 2250, UL 1581, UL 1277, and NFPA 70 Type ITC.

B.10.6 Droop Loop Cable

Conductors shall be extra flexible annealed copper with 600V rated insulation. Conductors shall be stranded according to ASTM B-174. The cable shall be surface marked with manufacturers name or trademark, conductor size, insulation type and UL label. Individual conductors shall also have a surface printed legend. Cable shall be suitable for outdoor, wet locations. The cable jacket shall provide sufficient strength to support the cable.

Number of conductors shall be as indicated on the drawings, provided with or without bare ground conductor of the same AWG size. When a bare ground conductor is not provided, an additional insulated conductor shall be provided and used as the ground conductor (e.g., 6/c #14 w/g and 7/c #14 are equal). When exposed to sunlight, UL listed and marked as sunlight resistant.

Sufficient length of cables must provide for excess length to accommodate pulling eyes, adequate slack for full range of travel, cable clamping, and connections.

The cable shall be supported with a heavy-duty, double-eye, split mesh, stainless steel cable grip.

Conform to NEMA/ICEA WC 57/S-73-532 and UL 44 and UL 1277 for type XHHW-2 insulation with an overall PVC jacket.

B.10.7 Fiber Optic Cable:

Ensure any new fiber optic cables are 12 strand outdoor heavy duty rated jacket, multi-mode 62.5 microns core size, 125-micron cladding, less than 3.4 decibels per kilometer (dB/km) at 850 nanometer (nm) and less than 1.0 dB/km at 1300 mm attenuation, greater than 200 megahertz over one kilometer (MHz/km) at 850 nm and greater than 500 MHz/km at 1300 nm bandwidth.

Furnish the fiber optic cables with an interlocking armor for mechanical protection.

Ensure the fiber optic cables are acceptable for indoor/outdoor applications and be tray-rated industrial cables and flame-retardant.

Utilize a fiber optic repeater if necessary to achieve the attenuation values specified herein.

B.10.8 Acceptable Manufacturers

Acceptable manufacturers for Building Wire, Multi-Conductor Power Cable, and Multi-Conductor Control Cable are American Insulated Wire, Okonite, Southwire or approved equal.

Acceptable manufacturers for Instrumentation Cable are Belden, Anixter, Igus or approved equal.

Acceptable manufacturers for Droop Loop Cables are TF Kable, Anixter, Omni Cable or approved equal.

Acceptable manufacturers for Fiber Optic Cable are Belden, Alpha, Anixter or approved equal.

Provide a durable marking on the outer surface of all cables or conductors at intervals not exceeding 24 inches. Marking shall include manufacturer's name, insulating material, conductor size, and voltage class.

Each conductor, of power, control and signal wiring, shall be color coded with colored insulation. Color coding of power wiring shall be black for Phase A or 1, red for Phase B or 2, blue for Phase C or 3, white for neutral, and green for equipment ground. Switch legs for local wall switches shall conform to local Code requirements.

B.11 Boxes

All exterior surface mounted pull, junction, splice, and terminal boxes shall be 14 gauge stainless steel, NEMA 4X, and shall be provided with hinged, overlapping covers of the same material, with pad-lock provisions and shall be by Hoffman Engineering Company, Hammond Manufacturing or approved equal. Exterior boxes mounted on the bridge steel work shall be primed and painted the same color as the bridge. Wall-mounted boxes installed in the control house shall be NEMA 12. Junction boxes and terminal cabinets mounted outside shall be NEMA 4X, 14 gauge stainless steel as described above.

Surface mounted interior and exterior boxes shall be provided with external mounting lugs. No box shall be drilled for more conduits or cables than actually enter it. No conduits shall enter the top of an enclosure. All conduit entries shall be bottom entry if possible. Exterior boxes shall be provided with one-half inch combination drain and breather fittings. Fitting shall not affect the NEMA-4X enclosure rating of the enclosure.

Terminal boxes shall be of sufficient size to provide ample room for the terminal blocks and interior wiring, and for the installation of conduit terminations and multi-conductor cable fittings. Interior panels shall be provided for mounting the terminal blocks. Terminal blocks shall be provided in each terminal box for the connection of all conductors including spare conductors entering the box plus at least ten percent spare terminals.

The interior of all boxes shall be provided with insulated supports from which bundled cables may be supported.

Furnish and install junction and pull boxes, reducers, and other fittings as required by these specifications or where required by the NEC or where required to facilitate pulling, whether shown on plans or not.

B.12 Hardware and Supports

Supports for conduits, wireways, cables, boxes, cabinets, disconnect switches, small limit switches, and other separately mounted items of electrical equipment shall be fabricated from structural steel not less than 3/8 inches thick. Clip angles and other supporting members, which are fabricated from structural steel plates and shapes and bolted to the structural members, shall be included with the structural steel. All other supporting members shall be included under the electrical work.

Structural steel brackets, boxes, and other equipment mounted on concrete surfaces shall be provided with a full neoprene gasket not less than 1/8 inch thick between the equipment and the surface of the concrete.

Expansion anchors for fastening equipment or brackets to concrete surfaces shall be wedge type anchor bolts, which lock in place by an expansion wedge as the nut is tightened. All parts of the expansion anchors shall be of Type 303 stainless steel. Holes for the anchors shall be drilled to the size and depth recommended by the manufacturer using carbide-tipped masonry drills.

Mounting bolts, nuts, washers, and other detail parts used for fastening boxes, disconnect switches, small limit switches, conduit clamps, cable supports, brackets, and other electrical equipment shall be of stainless steel according to the requirements of ASTM A276/A276M, Type 316. Bolt heads and nuts shall be hexagonal and furnished with medium-series lock washers. Bolts shall not be smaller than 3/8 inch in diameter, except as may be necessary to fit the mounting holes in small limit switches, boxes, and similar standard devices.

Usage of beam clamps for supporting conduits, boxes, or other equipment is prohibited, except for temporarily supporting existing raceways to remain or where specifically approved by the engineer.

Preformed metal framing channels, such as Kindorf, Unistrut, Superstrut, etc., is prohibited for mounting or supporting electrical equipment, conduits, or boxes except where specifically approved by the engineer.

B.13 Circulation Heaters

The circulation heaters shall be of the electric resistance, in-line type. The watt density of the circulation heater shall not exceed the acceptable limits for the hydraulic fluid but shall be a minimum of 5 watts/square inch. The circulation heater shall maintain the fluid at a temperature of 100ºF. The circulation heater shall be sized by the manufacturer to maintain the minimum acceptable fluid temperature when the ambient temperature is 32ºF. The circulation heater shall be controlled by automatic thermostats.

Heaters are to utilize existing disconnects. New raceways and cables as specified within are to be provided from the disconnect to the new circulation heaters.

Acceptable manufacturers include Chromalox, Wattco, Durex Industries, or approved equal.

B.14 HPU Enclosure Exhaust Fan

Centrifugal Fan Unit: Direct driven, with steel housing, resilient mounted motor, gravity backdraft damper in discharge.

Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor.

Grille: As required, molded aluminum with baked white enamel finish.

Accessories: Provide with Wall Cap and backdraft damper.

Provide exhaust fans with capacities and accessories as the existing fans.

B.15 HPU Enclosure Lighting

Light fixtures installed in the HPU enclosure to be surface mounted architectural style 4-foot wraparound fixtures. Fixture housing to be steel with polyester powder coat finish, with an acrylic lens. LED drivers shall be electronic 0-10V dimming type. The new lights shall be equivalent to the existing.

Light fixtures installed on the exterior of the enclosures are to be LED wall pack style fixtures with a polycarbonate housing and lens. The new lights shall be equivalent to the existing.

Provide products by Cooper Lighting, Lithonia, Gardco or approved equal.

B.16 Wiring Devices

Furnish all light switches, dimming switches, duplex grounded receptacles, and associated cover plates. All wiring devices shall be UL Listed. All wiring devices shall be brown with stainless steel wall plates, except for weatherproof device cover plates installed in the Bridge House Equipment Room, on the pier service platforms, and in the pier pits.

Light Switches shall be quiet toggle type, Extra Heavy-Duty Industrial Grade, UL and Fed. Spec. Listed, 20A, 120-277V AC.

Dimmer Switch for LED light fixtures to be slide-lever type, single pole, 120 V, leading/trailing edge phase-cut dimmer compatible with LED light fixture. On-off switch positions shall bypass dimmer module.

Occupancy sensors to be ceiling mounted, dual-technology type designed to detect occupancy by using a combination of PIR and ultrasonic detection methods in the area of coverage. Particular technology or combination of technologies that controls on and off functions shall be selectable in the field by operating controls on unit. Sensor operation shall turn lights on when covered area is occupied and off when unoccupied, with a time delay for turning lights off adjustable over a minimum range of 1 to 15 minutes.

Duplex receptacles shall be Extra Heavy-Duty Specification Grade, UL and Fed. Spec. Listed, 20A, 125V, NEMA 5-20R configuration. Receptacles installed outside shall also be weather-resistant GFCI type and provided with weatherproof covers that are listed for wet locations while in use.

B.17 Enclosed Switches

Furnish all fusible and non-fusible enclosed switches for equipment disconnecting means for all HVAC and plumbing equipment installed in the Bridge House. Enclosed switches shall conform to NEMA Standards Publication KS1 and shall be Heavy Duty Type. Operating mechanism shall be quick-make, quick-break, and interlocked with the cover in the closed position. Operating handle shall be lockable in both the OFF and ON positions. Fusible enclosed switches shall be provided with clips to accept Class R fuses. Enclosed switches shall be equipped with an equipment ground kit and a neutral kit where applicable. Enclosed switches located inside the building to have NEMA 1 enclosures, and enclosed switches located outside to have NEMA 4X 316 stainless steel enclosures.

C Construction

C.1 General

All construction and installation shall be made by workmen skilled in this type of work and under the supervision of an experienced and qualified electrical supervisor. In addition, the approved control system vendor shall provide supervisory assistance to the electrical contractor as specified herein. All work shall be executed in a neat and workmanlike manner and shall present a neat and mechanical appearance when completed. Upon completion of the contract, deliver to the engineer a corrected plan showing in detail all changes on construction from the original plans, especially location and sizes of conduits, complete schematic circuit diagrams and the like.

Provide all terminal strips with approved permanent terminal markings for each connected conductor in service. Place the marking on a material which will not be affected by age or moisture and apply two coats of clear lacquer after placing the markings.

The contractor shall comply with all local, state and federal rules and regulations concerning the legal disposal of any contaminated waste materials from the execution of this work.

C.2 Demolition

This work consists of the components noted on the plans. Demolition work includes the disconnection and/or removal and disposal of equipment. Equipment to be demolished shall include, but shall not be limited to, HPU main motors, control console top, rotary cam limit switch, proportional valve controllers and associated wiring.

The equipment to remain in place on the bridge shall be protected at all times from damage or defacement caused by the contractor's operations. Any such damage or defacement shall be promptly repaired or cleaned to the satisfaction of the engineer at no extra cost. If, in the opinion of the engineer, the contractor's operations require the temporary removal of existing equipment for proper protection, such removal and remounting shall be done at no extra cost.

Upon completion of the work, the contractor shall repair all damaged or defaced areas exposed by the demolition of equipment, or caused by his operations, in a workmanlike manner satisfactory to the engineer. The contractor shall patch any concrete that was cut for removal of equipment. Small bolt holes in concrete surfaces shall be filled with epoxy mortar. Holes in the walls, ceilings or floors of the house shall be filled with grout and finished to match the existing surfaces. Any damage to windows, window framing, sash, sills, frames or any other architectural trim shall be repaired, and painted surfaces shall be repainted after being repaired. Any holes in the ground shall be filled with earth top soil and suitably landscaped to match the surrounding areas.

C.3 Motor Installation

The motor frame and strip heaters shall be fed from a branch circuit on a lighting panelboard. All conduit, boxes, conductors, and other equipment necessary to extend power to the heaters shall be furnished.

Each span motor shall be installed with approved sizes and types of wire terminals and splice fittings for the connection of the motors to the circuit wiring. Each motor shall be furnished with conduit boxes. Connections between the rigid conduit system and the motors shall be made with flexible conduit sections not exceeding six feet in length.

C.4 Installing Raceway

Connect conduit sections to each other with screw couplings, made up so that the end of both conduits will butt squarely against each other inside of coupling and non-metallic conduit shall be solvent welded according to the manufacturer’s recommendations. Install conduits so as to be continuous and watertight between boxes or equipment. Protect conduits at all times from the entrance of water and other foreign matter by capping or well plugging overnight and when the work is temporarily suspended.

Install all conduits so that they will drain properly. Provide drainage tees at low points where required.

All field bends shall be long sweep, free from kinks, and of such easy curvatures as to facilitate the drawing in of conductors without injury. Conduit runs shall be made with as few couplings as standard lengths will permit, and the total angle of all bends between any two boxes shall not exceed 360 degrees. Long running threads will not be permitted.

Pull boxes shall be used wherever necessary to facilitate the installation of the conductors. Condulets shall not be used for pulling more than ten conductors or for making such turns in conduit runs or for branching conductors, except for indoor wiring to lighting fixtures and receptacles.

Galvanized rigid steel (GRS) conduit shall be installed only within the control towers and where the areas remain dry. PVC coated rigid steel (PVGRS) shall be installed within the pier areas and in areas where

the conduit will be exposed to wet environments. Rigid non-metallic (PVC) conduit shall be installed where ever the raceway is to be buried below grade or within concrete.

All conduit fittings shall be of the same type material as the conduit installed.

Where conduits pass through the floors or walls of the control room, galvanized rigid conduit sleeves shall be provided for free passage of the conduits. After the conduits are installed, caulk the opening with an elastic fireproof compound and escutcheon plates provided on the interior walls, ceilings, and floors for airtight fits.

Where wireways pass through floors or where conductors are required through floors for access to electrical equipment as shown on the plans, fill the openings and caulk with a fire proofing sealant after all conductors are installed. Where conductors pass through floors without the use of a wireway, provide escutcheon plates. Where wireways pass through floors, access panels shall be removable on both sides of the floor penetration when applicable. Sealants shall be manufactured by Carborundum, DowDuPont, Emerson Nelson Fire Stop Products, or approved equal.

Exposed raceway runs shall be straight and shall be parallel or at right angles to the general structure lines. Attachment to steel or concrete in the pier areas shall be by PVC coated fittings, straps, or hangers held at not less than two points by stainless steel bolts or lag screws. Concrete inserts shall be Unistrut, Eaton B-line, ABB Kindorf, or approved equal, fabricated from stainless steel. Conduits mounted exteriorly on parts of the steel work shall be set not less than 2 inches clear from the supporting structure to prevent accumulation of dirt, and they shall be securely clamped to the steel work to prevent rattling and wear. The clamps, in general, shall consist of U-bolts attached to angle or channel iron supports which are attached to the members as shown on the plans. The spacing of the clamps shall not exceed 5 feet.

Supports for electrical work which are fabricated from structural plates or shapes bolted to structural members and which are shown or requested to be included on the steel drawings, will be paid for under the items shown on the plans. Additional alterations and supports not shown or requested, but that are found necessary after completion of steel fabrication plans, shall be included for payment and additional compensation will not be considered.

See "Mechanical Work”, Item SPV.060.02 for coordination with bridge hydraulic system.

At any point where a conduit crosses an expansion joint, or where movement between adjacent sections of conduit can be expected, install bronze or alloy expansion fittings equal to Type AX as made by the Emerson O.Z. Gedney, Inc., Eaton Crouse-Hinds Type XJG, ABB Thomas & Betts Type XJG, or approved equal.

Use of flexible conduit is allowed only for the connection of motors, limit switches, and other devices that must be periodically adjusted in position. Connections between the rigid conduit system and all movable motors, and movable limit switches shall be made with flexible conduit with couplings and threaded terminal fittings. The flexible conduit shall be fully interlocked and shall be Type RT-6 as made by the Flexonics Corporation, Type UA-OR as Anaconda's Sealtite, Carflex by Carlon, or approved equal. Flexible conduit extensions shall not exceed 24 inches in length and shall be equipped with bonding jumpers.

All conduits shall be carefully cleaned, both before and after installation. Upon completion of the conduit installation, clear each conduit with a tube cleaner equipped with a mandrel of a diameter not less than 80 percent (80%) of the nominal inside diameter of the conduit, and shall then draw in the conductors.

Provide both ends of each conduit run with a brass tag having a number stamped thereon according to the conduit diagrams. Securely and permanently fasten these tags to the conduit ends with bare copper wire.

C.5 Installing Conductors

C.5.1 Circuit Identification

Use permanent wire markers for wire marking at all splices, terminals and lugs in all cabinets, wire ways and junction boxes. Ensure both ends of every single length of conductor are permanently and clearly tagged according to the same numbers or designations appearing on the approved wiring diagrams. Ensure wire tags for marking the conductors are heavy duty, heat shrink, waterproof, permanently marked, and resistant to UV light deterioration. Ensure numbers and letters are black or blue on a white background. Other wire marker types meeting the general specifications above, applied by professional marking equipment may be considered by the engineer, when submitted. Use clear vinyl to protect the legend in all cases. Embossing or painting wire insulation for wire identification is prohibited. The

engineer reserves the right to deny the use of any type of wire marker he deems to be inferior to the type specified for use.

Attach wire numbers permanently to the wire within 1.0 inches of termination. All wiring connections at any terminal strips or lugs must have the numbers facing out for easy troubleshooting.

C.5.2 Installation or Placement

Draw the wire and cables into conduits without causing injury to the wires or their insulation or covering.

Install all cables as recommended by the manufacturer. Adhere to the manufacturer's recommended maximum pulling tension and minimum bending radius during installation. Use the necessary guides, pulleys, sleeves, and pulling aids to prevent abrasion and damage to the cables during installation. Use lubricants recommended by the cable manufacturer and acceptable to the engineer for the pulling of conductors or cables. Permanently and clearly tag both ends of every single length of conductor with approved tags marked according to the same number and designation shown on the wiring diagrams. Connect all outgoing wires No. 8 AWG or smaller in the control console, on the switchboards and panels and in terminal cabinets to terminal blocks.

Spare conductors of a multi conductor cable shall be left at their maximum lengths for possible replacement of any other conductors in the cable. Coil each spare conductor and then tape it to the conductors being used.

Twisted shielded pair conductors or instrument conductors shall not be terminated at any point except at point of origin or point of finish. When instrumentation cables are required to cross the channel, cable run shall be continuous without cuts or splices. Should an occasion develop, instrument conductors may be required be cut and spliced in order to connect to other instrument conductors. The individual conductors and shielding shall be spliced according to the manufacturer’s instructions. The splice connections shall then be taped and wrapped to ensure adequate seal from noise and environment according to the manufacturer’s instructions.

Conductors inside terminal boxes and at the control panels and control console shall be installed in plastic wire ways or shall be neatly formed into cables and laced with two strands of an approved wax-treated linen cord or plastic tie-wraps, with the individual conductors leaving the cable at their respective terminal points. These conductors shall be looped to allow not less than 3 inches of free conductor when disconnected. These formed cables shall be held securely away from the terminals and from contact with the cabinet by means of approved insulating supports. Wiring duct meeting JIC standards will be acceptable.

All terminal strips shall be provided with approved permanent terminal markings for each connected conductor in service. The marking shall be placed on a material which will not be affected by age or moisture and shall be given two coats of clear lacquer after the markings are placed thereon or as stated elsewhere in these Specifications.

Splicing of conductors will not be permitted except for wiring to service lighting fixtures and receptacles.

All splices, T-taps, and free ends of 600 volt cables shall be insulated. General use cables shall be insulated with type 33 tape. High ambient cable shall be insulated with type 70 tape.

Wherever it becomes necessary to terminate, joint, or branch conductors, terminal blocks in boxes shall be used.

Cable connections for No. 8 and smaller, for making terminations and splices shall be with high pressure indent type pressure connectors. Connectors shall be copper and as manufactured by Buchanan Products, Burndy, Thomas & Betts, or approved equal.

Cable connections for No. 6 and larger for making terminations, T-taps, and splices shall be with a high compression or bolted type pressure connector. Compression connectors shall be installed as recommended by the manufacturer using the recommended tooling for installation. Bolted connectors shall have a non-rotating pressure cap and as manufactured by Burndy, O.Z. Electric, Buchanan, or approved equal.

C.5.3 Tests after Placement

All insulated conductors shall be electrically tested after placement. All circuits, including lighting circuits, shall be tested with the circuit complete except for connections to equipment. All splices shall be complete prior to testing. Any circuit failing to test satisfactorily shall be replaced or repaired and retested as directed by the engineer. All equipment and labor required for testing shall be provided by the contractor.

Test all insulated conductors for continuity and conductor identification. In addition, test all insulated conductors of multi-conductor cable for short circuits. Furnish portable, battery powered, ring testers, and other test equipment as required for the following tests:

(1) Continuity tests. Include all tests necessary to confirm that each conductor is continuous throughout its entire length.

(2) Identification tests. Include all tests necessary to confirm that the conductor being investigated originated and terminates at the locations designed in the Circuit List or indicated on the drawings.

(3) Short circuit tests. Include all tests necessary to confirm that no conductor of a multi-conductor cable is short circuited to another conductor in that cable.

(4) Power and control cable rated below 2,000 V. – Test all insulated conductors, except instrumentation cable, rated less than 2,000 V with a 1,000 V megger or an equivalent testing device. Perform insulation resistance measurements between each conductor and ground and between each conductor and all other conductors of the same circuit. Minimum acceptable resistance values are in excess of 100 Megohms.

(5) Instrumentation cable – Test all insulated conductors of supervisory and communication cable with a 500 V megger or an equivalent testing device. Perform insulation resistance measurements between each conductor and the cable shielding tape and between the two conductors in each pair. Minimum acceptable resistance values are 50 Megohms divided by the actual cable length in miles.

C.6 Nameplates

Provide nameplates for all major pieces of equipment named on the drawings, for all devices on the control console and in panels, and shall be made of laminated micarta or textolite with chamfered edges, and shall be engraved to show BLACK letters on a WHITE background. They shall be mounted with monel or stainless steel screws. Nameplates for devices shall show the device designation used on the schematic wiring diagram. Fuse nameplates shall show the type, ampere, and voltage rating of the fuses.

C.7 PLC Programming

Download, review, and modify the existing PLC program for the control system to incorporate the new circulation pumps, proportional valve controllers, power monitoring equipment, and HMI displays. This shall include updating all relevant I/O points, control logic, and communication protocols to ensure proper integration of the new equipment into the control system. Coordinate with the engineer to confirm the design intent and functionality of the modifications. Additionally, ensure that the HMI displays are updated to reflect the new equipment, including any necessary alarms, status indicators, and control interfaces. All modifications must be thoroughly tested and verified according to the project's commissioning requirements, with full documentation of the changes provided upon completion**.**

C.8 HMI Programming

General programing and operating requirements for each HMI touchscreen display screen is specified below. Each display screen must consist of multiple selectable screens which are also noted below that are activated via the touchscreen. The contractor shall adjust and add to the HMI screen program as directed by the engineer and the State during HMI and network testing as specified herein. The following is a list of the minimum screens required

- Main Display Screen (Default Screen):
- Includes general images of the bridge including pictorial imagine of traffic lights, gates, locks, soft starters, HPU motors, HPU, navigation lights, etc. and their status.
- Time and date stamp
- Angle of opening display
- Active alarm message display
- Selection tabs of alternate screens
- Time of traffic stopped display
- Traffic and Gates Screen:
- Includes general traffic gates and signals and their status (green for open to traffic, red for closed to traffic).

- Time and date stamp
- Angle of opening display
- Active alarm message display
- Selection tabs of alternate screens
- Time of traffic stopped display
- Operational status of each gate when selected including limit switch contact set point and status (open or closed) and activate alarms.
- Locks Screen:
- Includes general image tail locks and their status (green for open to traffic, red for closed to traffic).
- Time and date stamp
- Angle of opening display
- Active alarm message display
- Selection tabs of alternate screens
- Time of traffic stopped display
- Operational status of each lock when selected including limit switch contact set point and status (open or closed) and activate alarms.
- Span and HPU Screen:
- Includes general image of span HPU devices and their status (green for open to traffic, red for closed to traffic).
- System Operating Pressure
- HPU Motor Power, Voltage, Current
- Time and date stamp
- Cylinder displacement
- Angle of opening display
- Active alarm message display (include alarms for filter bypasses, low pressure, high pressure, low fluid level, high fluid level, and high temperature)
- Selection tabs of alternate screens
- Time of traffic stopped display
- Alarm Screen:
- Active alarm page with last 12 alarms with date and time stamps and active or inactive status.
- Acknowledge alarm button
- Silence alarm button
- Alarm history pages with date and time stamps
- Power Screen:
- Includes status of incoming service, generator and ATS
- Includes voltage and current values for each phase on the incoming service
- Time and date stamp
- Angle of opening display
- Active alarm message display
- Maintenance Screen
- Directions screen when selected
- System network
- Password protected bypass operation for manual operation and testing.
- Status screens of all PLC input and output devices with PLC address and device designation.

The PLC program must generate alarms when they occur. Ensure the alarm is sent once to the HMI and not again until the next time the alarm condition occurs. The HMI must provide an audible tone with each alarm message until the HMI acknowledge button is pressed.

Ensure all the standard PLC processor and equipment fault conditions and alarms, furnished as part of the PLC equipment, generate an alarm.

Ensure all the standard communications equipment fault alarms and conditions, furnished as part of the communications equipment, will generate an alarm.

Be prepared to add an additional 250 alarms during the Factory Testing and another 250 during Start Up and Commissioning as directed by the engineer.

The following is a list of the minimum alarms required. Some of the alarm descriptions are typical, provide a dedicated alarm for each piece of equipment.

- Any existing alarms provided on the existing HMI screens.
- PLC Communication fault to any networked device.
- PLC Processor fault.
- Any New Circuit Breaker in MCC Tripped
- Any New Motor Overload Tripped
- Control Power has been turned off.
- Emergency Stop pushbutton was de-pressed.
- Any Emergency Stop control relay operated when the Emergency Stop pushbutton was not depressed.
- Any Emergency Stop control relay did not operated when the Emergency Stop pushbutton was depressed.
- Any Warning Gate did not lower after 30 seconds.
- Any tail lock did not withdraw after 30 seconds.
- Any Warning Gate did not raise after 30 seconds.
- Any warning gate door open or hand crank operation.
- Any tail lock did not drive after 30 seconds.
- HPU motor did not start running after 30 seconds.
- Manual system operation engaged
- Soft Starter has a trouble alarm.
- Soft Starter is not ready.
- Soft Starter or any motor is disconnected at the local motor disconnect switch.
- Position transmitter (rotary cam resolver, cylinder transducers) failure.
- Position transmitter (rotary cam resolver, cylinder transducers) is not in synch with rotary limit switch.
- Span decel check during span operation failed.
- Any Bypass was activated.
- PLC Communication Fault

C.9 Field Tests

C.9.1 Preliminary Checkout Period

Arrange for and provide all the necessary field tests, as indicated herein and as directed by the engineer, to demonstrate that the entire electrical system is in proper working order and is according to the plans and specifications.

The contractor shall be responsible for operation and maintenance, including all costs thereof, for systems or equipment temporarily placed in operation for testing and adjusting purposes or for the convenience or necessity of the contractor, prior to final acceptance by the engineer.

The contractor shall instruct the bridge operating personnel in the operation of equipment during test runs and prior to acceptance.

C.9.2 Manufacturer Representatives

Arrange for appropriate representatives of the bridge electrical control equipment to be on site to adjust the equipment, locate faults and defects, and make corrections. Obtain from the manufacturers without delay, new parts for replacement of apparatus which, in the opinion of the engineer, do not perform satisfactorily.

C.9.3 Operational Testing Period

After the span is operating to the satisfaction of the engineer, the contractor and its manufacturers' representatives, an operational test period of not less than one week shall begin, during which time all aspects of the bascule span control system and remote control system will be tested and observed by the engineer. During this period, the contractor shall make any repairs necessary as a result of equipment failure due to faulty equipment or workmanship. Should preliminary checks or operational tests show that any piece of equipment furnished by the contractor, in the judgment of the engineer, is defective or functions improperly, such adjustments and/or replacements shall be made by the contractor as to make the installation completely acceptable to the engineer, and at no extra cost to the department.

C.10 Sequence of Normal Operation

The sequence of operation for the bridge shall remain the same as the existing system.

Input the new rotary cam position resolver into the existing PLC system for use as a comparison against the cylinder position.

C.11 Training

Provide and conduct training sessions consisting of the following:

Fully train bridge operators on operation of the bridge both for local control and manual control.

Fully train maintenance personnel on the maintenance aspects of the proportional valve controller, and data logging software.

D Measurement

The department will measure Bridge Electrical Work by each unit, acceptably completed. Spare electrical parts are excluded.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0060.01	Bridge Electrical Work	EACH

Payment is full compensation for removing and disposing the existing electrical components; for furnishing and installing the new system components as specified, ready for operation; for operation and maintenance manuals; and for furnishing all shop drawings, and services (including control system vendor services) necessary to achieve a complete and acceptable installation.

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

A minimum of ten-percent of the bid item amount will be retained by the department until final acceptance of the bridge electrical system, the contractor and control system vendor have completed all items on their punch lists, and all aspects of bridge operation, operator and maintenance personnel testing, training, and control are complete. An additional five- percent of the bid item amount will be retained until final approval of the operation and maintenance manuals is granted by the engineer.

27. General Machinery

A Description

A.1 Scope of Work

This section applies to the project Mechanical and Hydraulic Work. In addition, the requirements of this section apply to the installation of electric motors, instrumentation, and limit switches to be installed, but supplied under separate items.

A.2 Basis of Mechanical Design

The design of new machinery conforms to the applicable requirements of the *American Association of State Highway and Transportation Officials, AASHTO LRFD Movable Highway Bridge Design Specifications, 2nd Edition, 2007* with interim revisions through 2018, (hereinafter referred to as the AASHTO Standard), unless otherwise noted on the plans or stated herein.

A.3 Submittals

Submit manufacturer's data and/or shop drawing data for all manufactured and purchased items of bridge machinery. Include for each manufactured item: the manufacturer's descriptive literature, drawings, diagrams, performance and characteristic curves, and catalog cuts; the manufacturer's name, trade name, catalog model or number, nameplate data, size, certified layout dimensions, capacity, specification reference, and applicable Federal and Military Specification references; and all other information necessary to establish contract compliance.

A.4 Shop Drawings

Provide shop drawings conforming to the requirements specified hereinafter. Show all parts completely detailed and dimensioned on the shop drawings. State the grade and amount of finish machining, with all tolerances and allowances, and identify each part requiring a specific fit. Finished surfaces are defined by the ANSI/ASME B46.1, Surface Texture, and fits are defined by the ANSI/ASME B4.1, Preferred Limits and Fits for Cylindrical Parts, unless otherwise noted on the plans or stated herein. The ANSI/ASME B4.1 standard also applies to fits for non-cylindrical parts.

Show proprietary items in outline form on the drawings. Indicate the method and sequence to be employed during assembly of bridge machinery and installation of necessary utilities support and service facilities. Show all external dimensions and clearances necessary for installation and operation of each item or furnish complete assembly diagrams showing each part contained within an assembly and the manufacturer's part number assigned to each part. Provide a diagram sufficient to enable complete disassembly and reassembly of the item covered. In the event that any part is modified in any manner from the way it is described or delivered by its original manufacturer, deliver a drawing that details each modification and assign a unique part number to preclude the supply of replacement parts not modified in similar fashion. Provide assembly drawings of each item in addition to identifying and describing each internal part to contain: dimensions of all principal elements within the item; certified external dimensions affecting interfaces or installations; gross weight capacity and normal operating ratings; method and recommended type of lubrication, including location and type of fittings and provisions for adding, draining, and checking the level of each lubricant employed; inspection openings, seals, and vents; and details of all fasteners used to mount the equipment to its foundation.

Make a complete shop bill of materials for all machinery parts.

State the material and material specifications for each part. Give the designated numbers of specifications where American Society for Testing and Materials Specifications or any other standard specifications are used. Use abbreviations on the drawings to designate standard specifications for materials and workmanship as listed in Section A5.3, Codes and Standards, of these Detailed Requirements.

These abbreviations are used on the plans and within these Detailed Requirements.

Furnish complete assembly and erection drawings. Include identifying marks and essential dimensions for locating each part or assembled unit with respect to the bridge structure or foundation. Use of mirror image or opposite hand erection drawings is prohibited.

Give a suitable title to each shop drawing to describe the parts detailed thereon and state by whom the internal quality control shop inspection will be performed.

Standard Compliance: Submit proof of conformance for applicable organizations such as, American Society for Mechanical Engineers (ASME), Underwriters Laboratories (UL), American Gas Association (AGA), and American Refrigeration Institute (ARI), for all equipment or materials. The label or listing of

the specified organization will be acceptable evidence. In lieu of the label or listing, submit a certificate from an independent testing organization, adequately equipped and competent to perform those services, and approved by the engineer. Provide a certificate which states that the item has been tested according to the specified organization's test methods, and that the item conforms to the specified organization's standard or code.

Certified Test Reports: As used herein, certified test reports refer to reports of tests conducted on previously manufactured materials or equipment identical to that proposed for use.

Factory Tests: Factory tests refer to tests required to be performed on the actual materials or equipment proposed for use. Submit the results of all tests according to the provisions of this contract for laboratory test results.

Submit the required shop drawings for machinery items to the engineer for review within 60 days after the first day of contract time.

Submit to the engineer for approval all shop drawings. In case of correction or rejection, resubmit until drawings are approved. Bear all costs for damages, which may result from the ordering of any materials prior to the approval of the shop drawings. Do not perform work until the shop drawings have been approved. After approval of the shop drawings, supply the engineer with copies of the approved shop drawings.

A.5 Quality Assurance

A.5.1 Standard Products

Provide materials and equipment that are essentially the standard catalogued product of manufacturers regularly engaged in production of those materials or equipment and are manufacturer's latest standard design that complies with these Detailed Requirements. Provide materials and equipment that are essentially duplicate items that have been in satisfactory commercial or industrial use at least two years prior to bid opening. Where two units of the same class of equipment are required, provide products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. Provide the manufacturer's name and address and the model and serial number on a nameplate, securely affixed in a conspicuous place for each major component. The nameplate of the distributing agent will not be acceptable.

A.5.2 Manufacturer’s Recommendations

Where installation procedures or any part thereof are required to be according to the recommendations of the manufacturer of the material being installed, furnish the engineer with printed copies of the recommendations prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material. Provide as part of the work, all special machining and installation required by the component manufacturer.

A.5.3 Codes and Standards

Adhere to all applicable requirements of the latest edition of codes and standards issued by, but not limited to, the following organizations and publications, whose abbreviations used in these Special Provisions are as shown:

AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Bearing Manufacturers Association
AGMA	American Gear Manufacturers Association
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
NLGI	National Lubricating Grease Institute
SAE	Society of Automotive Engineers
NFPA	National Fluid Power Association

ISO International Organization for Standardization

Meet the work requirements of all other codes and standards as specified elsewhere in these Special Provisions. Where codes and standards are mentioned for any pay item, it is intended to call particular attention to them; it is not intended that any other codes and standards be omitted if not mentioned.

A.5.4 Qualifications, Personnel and Facilities

For the fabrication, installation, aligning, cleaning, lubricating, testing, and all other mechanical work required by the project, use adequate numbers of skilled, trained, and experienced mechanics, millwrights, and service personnel who are thoroughly familiar with the requirements and methods specified for the proper execution of work.

For the installation, aligning, and fastening of bridge machinery, use adequate numbers of skilled, trained, and experienced millwrights with at least two (2) prior movable bridge jobs as past experience. Submit the millwrights' resumes showing the applicable experience for approval by the engineer.

Equip mechanics, millwrights, and service personnel with all necessary instruments to assure that related components have been provided within acceptable tolerances, and to make all necessary adjustments for attaining the specified ratings.

Hydraulic system fabrication, installation and startup shall be performed by a qualified contractor. Utilize a hydraulic contractor that has at least ten years' experience in the design, fabrication, and installation of hydraulic systems of this size and type.

Employ certified fluid power technicians with proper experience on similar systems for piping and flushing work. At least one member of the installation crew shall be a certified fluid power technician or equal approved by the engineer. Submit their certification number and experience for review and approval.

A.5.5 Rules, Regulations and Ordinances

Assure that work complies with all applicable Federal, State, and Local rules, regulations, and ordinances.

In the event of a conflict between these Specifications and the above-mentioned codes, standards, rules, regulations and ordinances, the most stringent requirements apply.

A.5.6 Substitutions

The terms "approved equal," "of equal quality," and "or equal" which appear on the plans and in these Special Provisions, are intended to allow the contractor to substitute other manufacturers and model numbers of products of equal quality and rating for those specified.

Prior to the ordering of any substitute product, obtain in writing the engineer's approval of the equivalence of the substitute product. The acceptance of the substitute product is at the sole discretion of the engineer who will establish the basis for equivalence and will review the quality of the materials and products described in detail on the submitted shop drawings and product data.

The engineer will return submissions for substitute material marked "Approved" or "Revise and Resubmit." Upon return of a submission marked "Revise and Resubmit," return the submission showing the specified product. Rejection or acceptance of a proposed substitute will not in any way result in additional cost to WisDOT, or in additional contract time.

Approval by the engineer of any substitute product submitted by the contractor does not relieve the contractor of responsibility for the proper operation, performance, or functioning of that product.

A manufacturer's name and catalog part number specifying a particular product, whether in these Special Provisions or on the plans, is so specified to establish quality, configuration, and arrangement of parts. An equivalent product made by another manufacturer may be substituted for the specified product subject to the approval of the engineer; however, make all necessary changes required by the substitution in related machinery and structural, architectural, and electrical parts, at no additional cost to WisDOT.

If any departures from the plans or these Special Provisions are deemed necessary by the contractor, submit details of those departures and the reasons therefore, as soon as practicable for approval. Make no such departures without approval by the engineer.

A.6 Operating and Maintenance Manuals (Mechanical)

A.6.1 General Requirements for Manuals

Furnish manuals containing descriptive material, catalog cuts with specific product clearly identified, reduced shop drawings, and all information necessary for successful operation and maintenance of the bridge machinery systems. Any revisions required after the start-up period should be addressed by errata or addenda to the manuals.

Clearly print all submittals, data, drawings, diagrams, etc. so that all printed matter is accurate, distinct, and clearly legible. Illustrations are to be clear and printed matter, including dimensions and lettering on drawings, are to be legible. If reduced drawings are incorporated within the manuals, darken the original lines and letters as necessary to retain legibility of the drawings after reduction. Fold larger drawings to page size and insert in manuals.

Produce all printed matter, data, drawings, diagrams, etc., by methods that shall offer permanence and durability. Use paper that is water resistant. No materials are to be used that will adversely affect this permanence and durability.

A.6.2 Contents of Manuals

Inscribe the following identification on the manual cover: the words “Operating and Maintenance Manual,” the name and location of the bridge, the contract number, the date, and the names of the consultant and contractor.

Include the names, addresses, and telephone numbers of each subcontractor installing the equipment and systems, as well as the local representatives for each item of equipment and system to be installed.

Provide a table of contents and assemble to conform to the table of contents with the tab sheets placed before instructions covering the subject.

Include the following in the manual as a minimum: a system layout showing all new machinery/hydraulic components and equipment with data to explain detailed operation and control of each new component; a detailed description of the function of each new principal component of the system; installation instructions; maintenance and overhaul instructions; lubrication schedule to include type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures; performance data; and parts lists. The parts lists for equipment shall indicate the sources of supply, recommended spare parts, and the service organization that is reasonably convenient to the bridge site.

Include manufacturer’s standard publications provided that particular literature covers information and data specific to the equipment actually furnished.

Refer to Specification Section Bridge Electrical Work for items to be included in the electrical section of the Operations and Maintenance Manual.

Complete the manuals in all respects for all equipment, controls, accessories, and associated appurtenances provided.

A.6.3 Materials for Manuals

Bind the operating and maintenance manuals in heavy-duty, nickel-plated three-hole binders with three trigger positions: lock, unlock and open. Use binders that have metal hinges. Use a locking mechanism that allows sheets to lie flat (i.e. channel lock). Use covers made of stiff, heavy-duty plastic or other approved material. Binder type shall be either elliptical ring, round ring, screw post, or post with channel lock, as directed by the engineer.

Bind the printed material into each book between rigid covers. Use instruction books containing drawings that measure 8.5 x 11 inches to minimize excessive folding and to allow for ease of use. Neatly title the books with a descriptive title, the name of the project, the location, the year of installation, the name of the manufacturer, the engineering firm, and the contractor. Provide legible copies of drawings in black on white background. Submit the arrangements of the books, the method of binding, and the material to be included to the engineer for approval.

Use 8.5 x 11-inch, 20 lb., copy paper, acid-free punched paper that is a quality suitable for archival use. The punched holes, each with a minimum diameter of 5/16-inch, are to be reinforced with plastic or cloth to the standard 3 hole spacing.

For foldout diagrams and illustrations, reinforce all holes (5/16-inch minimum diameter) with plastic or cloth to standard 3 hole spacing.

A.6.4 Sequence of Submittals for Manuals

Submit two copies of sample formats and outlines of contents in draft form ninety (90) days prior to the earliest: of final inspection, acceptance tests, or return of the span operation to WisDOT. Show proposed methods of binding, methods of printing, and reproduction.

Submit two copies of complete manual in final form 30 days prior to final inspection, acceptance tests, or return of the span operation to WisDOT.

Submit three hard copies and one electronic copies, in .pdf format, of approved manual 10 days after final inspection and acceptance tests.

A.7 Posted Operating Instructions

Provide operating instructions (approved by the engineer) for all new equipment for the use of operation and maintenance personnel. Include diagrams showing the complete layout of the entire system framed under acrylic plastic or in approved laminated plastic and posted where directed by the engineer. Post printed operating instructions for each principal piece of equipment including proper adjustment, operation, lubrication, safety precautions, procedures in the event of equipment failure, and any other necessary items of instruction as recommended by the manufacturer of the unit. Attach to or post adjacent to the piece of equipment. Use weather-resistant materials when producing operating instructions, or suitably enclose the instructions for protection from the weather. Do not mount operating instructions in direct sunlight. Secure operating instructions to prevent easy removal or peeling.

B Materials

B.1 Castings and Forgings

Communicate with the engineer to arrange for inspections and tests before any work is started. Notify the engineer not less than two weeks prior to the start of work so that a representative of the engineer may be present.

Take all necessary precautions to fabricate the castings true to pattern in form and dimensions, free of pouring faults, cracks, cold shuts, blow holes and other defects in positions affecting their strength and value for the service intended.

Provide castings cleaned and free of loose scale and sand. Remove all fins, seams, gates, risers, and other irregularities. Provide castings with rounded corners and with all inside angles having ample fillets.

Visually examine all castings according to ASTM A802. Meet visual inspection acceptance criteria Level II. Castings that do not pass this test may be rejected. Submit test results, whether positive or negative, to the engineer. Test records meeting Level III may be considered for weld repair, provided the manufacturer submits a procedure to the engineer for review and approval.

Perform 100% ultrasonic testing per ASTM A609 on all castings that have solid sections 2 inches (50.8 mm) thick or greater and all fracture critical members. Use test Method A and meet Quality Level 2. Castings that do not pass this test may be rejected. Submit test results to the engineer, whether positive or negative. Test records meeting Quality Level 3 may be considered for weld repair, provided the manufacturer submits a procedure to the engineer for review and approval. Ultrasonically test any weld repair.

Magnetic particle examine all casting surfaces according to ASTM E125, meeting the following acceptable levels of discontinuities:

Type I	Cracks/Hot Tears	1/4-inch (6.35 mm) max
Type II	Shrinkage	Degree 3
Type III	Inclusions	Degree 3
Type IV	Chaplets	Degree 2
Type V	Porosity	Degree 1

Submit test results to the engineer, whether positive or negative. All surface discontinuities may be considered for weld repair, provided the manufacturer submits a procedure to the engineer for review and approval.

Provide repair procedures that include details of the areas to be repaired and a means to qualify the repair method. Perform approved repair procedures prior to final heat treatment, so that no weld repairs will be needed after final machining. In addition, remove all surface defects by machining prior to final heat treatment.

At the contractor's expense replace all castings that fail to meet the established acceptance criteria and are considered rejected.

Provide carbon and alloy steel forgings that meet the requirements of AASHTO Specification M102 (ASTM A668) unless otherwise indicated or approved by the engineer.

Reduce all forgings to size from a single bloom or ingot until homogeneity is secured. Utilize blooms or ingots, from which shafts or pins are to be made, having a cross-sectional area at least three times that required after finishing. Do not forge at less than a red heat.

B.2 Bronze Castings

Provide bronze castings that meet the requirements of *AASHTO Specification M107* (ASTM B22) and are Copper Alloy UNS No. C91100 unless otherwise indicated or approved by the engineer.

B.3 Shafting and Pins

Fabricate all shafts in conformance to tolerances in ASTM A29 unless otherwise indicated. Turned, ground, and polished shafting straightness tolerances are to be up to 0.002 inch per foot (0.16 mm per meter) for shafts up to and including 1-1/2 inches (38 mm) in diameter, and up to 0.003 inch per foot (0.25 mm per meter) for shafts over 1-1/2 inches (38 mm) in diameter.

Accurately finish all shafts and pins round, smooth, and straight and when turned to different diameters, round fillets at the shoulders. Bore lengthwise through the center (to a diameter approximately 1/5 the smallest body diameter) for each shaft or pin having a uniform diameter of more than 8 inches (203 mm) and each shaft or pin having several diameters, of which the smallest is more than 8 inches (203 mm).

As required lengths are reached, fabricate each end of all shafts with a 60-degree lathe center, with a clearance hole at the exact center of the shaft. Prepare the ends of the shafts that have a hole bored lengthwise through the center for the attachment of a centering device equivalent to the lathe center. All such devices are furnished as part of the work. All such devices are to fit within the shaft ends such that the bore and lathe center are concentric to within 0.002 inch.

Where it is required on the plans that stepped shafts have fillets blended in smoothly to adjacent surfaces without tool marks or scratches, machine the surfaces to an ANSI maximum roughness of 63 micro inches (1.6 micro meters), unless otherwise required herein or on the plans to have a finer finish.

Fabricate all cold-finished shafting that is the type and grade of the steel shown on the plans, test for its mechanical properties, and submit a test certificate to the engineer. Fabricate each cold-finished shaft free from camber. Test each to ensure rotation and that each runs without vibration, noise, or chatter at all speeds up to and including the maximum rated speed.

Use turned, ground, and polished commercial shafting of the grade specified where shown on the plans.

B.4 Fasteners

All bolts, either for connecting machinery parts to each other or to supporting members are categorized as one of the following types:

- Finished body, high-strength bolts
- Turned bolts, cap screws, and studs
- High-strength turned bolts, cap screws, and studs

Provide finished body, high-strength bolts unless otherwise noted for all high-strength bolts shown on the plans.

Provide finished body high-strength bolts that meet the requirements of ASTM A449 and have finished bodies and regular hexagonal heads. Individually ream holes for high-strength bolts for a clearance of not more than 0.010 inch (0.25 mm) larger than the actual diameter of individual bolts for that hole.

Provide turned bolts and cap screws with turned shanks, cut threads, and finished washer-faced hexagonal heads. Provide studs with cut threads and turned shanks. For the finished shank of all turned bolts, cap screws and studs, use 1/16 inch (1.6mm) larger in diameter than the diameter of the thread. Determine the head and nut dimensions based on the thread diameter. For the shanks of all turned fasteners, use a Class LC6 fit in the finished holes according to ANSI B4.1. Meet the requirements of ASTM A307, Grade A for the turned fastener material.

High-strength turned bolts, cap screws, and studs are to meet the requirements above, except that the material shall meet the requirements of ASTM A449.

Dimensions of all bolt heads, nuts, and hexagonal head cap screws are to conform to ANSI/ASME B18.2.1, Square and Hex Bolts and Screws, and ANSI/ASME B18.2.2, Square and Hex Nuts.

Provide heavy series heads and nuts for turned bolts, turned cap screws, and turned studs.

Dimensions of socket-head cap screws, socket flat-head cap screw, and socket-set screws are to conform to ANSI B18.3, Socket Cap, Shoulder, and Set Screws. Unless otherwise called for on the plans or specified herein, make the screws of heat-treated alloy steel, cadmium-plated, and furnish with a self-locking nylon pellet embedded in the threaded section. Set screws are to be of the headless, safety type with threads of the coarse thread series and having cup points. Do not use set screws to transmit torsion nor as the fastening or stop for any equipment that contributes to the stability or operation of the bridge.

Fabricate all threads for bolts, nuts, and cap screws to conform to the course thread series having a Class 2 tolerance for bolts and nuts or Class 2A tolerance for bolts and Class 2B tolerance for nuts according to the ANSI/ASME B1.1, Unified Inch Screw Threads.

Spot face all bolt holes through unfinished surfaces for the head and nut, square with the axis of the hole.

Unless otherwise called for, sub drill all bolt holes in the machinery parts for connecting these parts to the supporting steel work at least 1/32 inch (0.8 mm) smaller in diameter than the bolt diameter and ream assembled for the proper fit at assembly or at erection with the steel work after the parts are correctly assembled and aligned.

Furnish positive locks of an approved type for all nuts, except those on ASTM A449 bolts. Provide tempered steel and conform to the SAE regular dimensions for lock washers, where applicable. Use materials that meet the SAE tests for temper and toughness.

Furnish a hardened plain washer at each end of high-strength bolts meeting the requirements of ASTM F436.

Provide cotters conforming to the SAE standard dimensions and made of half-round stainless-steel wire, ASTM A276, Type 316.

Use only fasteners manufactured in the United States with the property class and source identification appearing on the top of head.

B.6 Sleeve Bearings and Bushings.

Fit all bearings as shown on the plans. Accurately machine the surface between the bushing and base.

Provide spiral grease grooves for each bushing. Round the corners of all grooves to a radius of not more than half the width of the groove.

B.8 Shaft and Pin Journals

Accurately turn all journal bearing areas on shafts and pins. Grind and polish the journal surface and adjoining shoulder fillets to an ANSI maximum roughness of 8 micro inches (0.2 micro meters), leaving no trace of tool marks or scratches. Burnishing of the shaft journal area and adjoining shoulder fillets will be acceptable in lieu of grinding and polishing, provided the burnishing is done with a Stellite roller or equal, finished to a mirror surface. Finish journal diameters to the limits of an ANSI Class RC6 running fit.

B.9 Hubs and Bores

Finish the hubs of all gears, wheels, and couplings on both faces; polish the area where the hub face performs the function of a collar to prevent shaft movement. Bore the hubs concentric with the rims of gears and wheels or with the outside of the couplings. Furnish all hubs to have an ANSI Class FN2 medium shrink fit on the shafts, unless otherwise specified.

B.10 Shims

Provide brass shims, neatly trimmed to the dimensions of the assembled parts and drill for all bolts that pass through the shims used for leveling and alignment. Provide shims that are half-hard tempered Brass Alloy 260 conforming to ASTM B19 or ASTM B36 or stainless-steel conforming to ASTM A276 grade 316 and furnished with certification and test reports. Provide shims without bolt holes and ream after final alignment of equipment to the same fit as the other connected components. For shims greater than ½ inch (12.7 mm), include one solid plate of thickness equal to 1/2 inch (12.7 mm) less than total shim thickness.

Provide fully dimensioned shims as shown and detailed on the shop drawings. Shims with open side or U-shaped holes for bolts will not be permitted. Use a minimum of two holes for bolts. To prevent distortion of shims, do not punch bolt holes at machine shop.

In general, provide sufficient thickness to secure 1/64-inch (0.4 mm) variations of the shim allowance plus one shim equal to the full allowance. Comprise the 1/2-inch (12.7 mm) nominal shim pack of the following thickness variations: one 1/2-inch (12.7 mm), one 1/4-inch (6.4 mm), one 1/8-inch (3.2 mm), one 1/16-inch (1.6 mm), one 1/32-inch (0.8 mm), and two 1/64-inch (0.4 mm).

B.11 Welding

Perform welding required for machinery according to the requirements of the AASHTO/AWS D1.5, AWS D1.1, AWS D1.6 or ASME B31.1. Stress relieving is required prior to machining.

Provide welding joint sizes and details as shown on the shop drawings. For required multi-pass welds, submit welding procedures with shop drawings.

Utilize welding fixtures and proper welding procedures to minimize distortion during fabrication.

For all welds used to fabricate machinery, completely test by ultrasonic inspection per AWS D1.5 for tension welds unless otherwise noted. Perform all machining after welding and stress relieving.

B.14 Lubrication

B.14.1 Lubrication Fittings

Use NPS 1/4 giant button head fittings, unless otherwise indicated on the plans. Where required, provide stainless steel seamless pipe to connect fittings to housings, allowing grease to discharge directly through the housing, shims, bushing, and into the grease grooves for distribution. Locate all grease fittings for convenient greasing, and connect the points requiring lubrication from convenient lubrication stations by NPS 1/4 stainless steel seamless pipe – schedule 80 with stainless steel threaded pipe fittings – 3000 psi. Meet ASTM A312 and ASTM A182 for all stainless-steel pipe and fittings, respectively. Keep all pipe extensions as short as practical; securely support the pipe extensions at fittings and at intermediate points and locate so that they are protected from injury. Install only lubricating equipment that is in perfect condition.

Do not use more than two (2) sizes of fittings. Use the large size wherever possible; use the smaller size for motor bearings and other small devices. Use pressure fittings rated at a minimum of 3,000 psi (21 mPa). Furnish fittings that contain a steel check valve that will receive grease and close against back pressure.

Immediately after the completion of fabrication, plug all fitting locations until components are installed and regular lubrication is started. At that time, replace the plugs with proper grease fittings. During installation, lubricate all rotating and sliding parts of the machinery and fill all bearing housings and flexible couplings with lubricants indicated on approved lubrication charts.

In any areas that are generally difficult to access, such as the rod end and rear clevises of the main span drive cylinders, run grease lines to a manifold that is located in a more accessible area.

B.14.2 Lubrication Charts

Furnish three copies (on mylar) of lubrication charts showing the location of all lubricating fittings and other points of the mechanical and electrical equipment which require lubrication of any kind; show the kind of lubricant to be used at each point; and document the frequency of lubrication. Frame the charts under acrylic in neat wooden frames, and place as directed by the engineer.

For each machinery component, store all related maintenance and lubrication literature in a heavy-bound binder, which is to be kept in the control house.

C Construction

C.1 General

Comply with all city, state and federal rules and regulations concerning the legal disposal of any contaminated waste materials from the execution of this work.

C.2 Shop Fabrication

To permit inspection, give two weeks' notice to the engineer before the beginning of work at foundries, forge, and machine shops. Notify the engineer of the location(s) where the order(s) have been placed prior to casting, forging, or machining any materials.

Furnish all facilities for the inspection of material and workmanship in the foundries, forge, and machine shops. Allow free access to necessary parts of the premises to the Inspector designated by the engineer. Work performed while the Inspector has been refused access or presented in a manner that prevents adequate inspection will automatically be rejected.

The Inspector has the authority to reject materials or workmanship, which do not fulfill the requirements of these special provisions.

Inspection at the foundries, forge, and machine shops is intended as a means of facilitating the work and avoiding errors. It is expressly understood that inspection will not relieve the contractor from any responsibility in regard to imperfect material or workmanship and the necessity for replacing defective materials or workmanship, which are delivered to the job site.

Furnish the engineer with a copy of all orders covering work performed by subcontractors or suppliers.

Unless otherwise provided, furnish without additional cost to the department test specimens as required, and all labor, testing machines, tools, and equipment necessary to prepare the specimens and to make the physical tests and chemical analyses required by material specifications. Furnish a copy of all test reports and chemical analyses to the engineer.

The acceptance of any material or finished parts by the engineer are not to be a bar to their subsequent rejection if found defective. Replace rejected material and workmanship or make acceptable at no additional cost to the department.

C.3 Shop Installation and Testing

Assemble machinery components to verify their correct fit prior to shipment. Utilize measurements for each assembly that are shown on the plans and/or described in the special provisions.

C.4 Defective Material and Workmanship

All machinery rejected during inspection and testing, that is not made acceptable, is to be removed from the work site and replaced at contractor's expense.

Delays resulting from the rejection of material, equipment or work is not a basis of any claim.

Correct, at contractor's expense, all defects found during the guarantee period resulting from faulty material, components, workmanship, or installation.

C.5 Delivery and Storage

C.5.1 Protection for Shipment

Clean machinery parts of dirt, chips, grit, and all other injurious materials and coat all unpainted surfaces with a corrosion-inhibiting preservative prior to shipping.

As soon as practicable after finishing, coat finished metal surfaces and unpainted metal surfaces that would be damaged by corrosion with a rust-inhibiting preservative. Remove this coating prior to operation and from all surfaces prior to painting after erection.

Apply an engineer-approved coat of zinc-rich primer to any interface between stainless steel or aluminum and structural steel prior to assembly.

Completely protect machinery parts from weather, dirt, and all other injurious conditions during manufacture, shipment, and storage.

Protect shaft journals that are shipped disassembled from their bearings during shipment and before erection by a packing of oil-soaked rags secured in place by burlap and covered with heavy metal thimbles or heavy timber lagging securely attached. Take every precaution to ensure that the bearing surfaces are not damaged and that all parts arrive at their destination in satisfactory condition.

Mount assembled units on skids or otherwise crate for protection during handling and shipment.

C.5.2 Package and Deliver Spare Parts

Protect spare parts for shipment and prolonged storage by coating, wrapping, and boxing.

Durably tag or mark all spare parts with clear identification showing the designation used on the approved shop drawing.

Clearly mark on the outside of the boxes for spare parts showing their contents. Deliver spare parts to a location designated by the department.

C.5.3 Guarantee and Warranties

Obtain and provide manufacturers' warranties or guarantees on equipment, materials, or products purchased for use on the contract that are consistent with those provided as customary trade practice. Assign to the department all manufacturers' warranties or guarantees on all such equipment, material, or products furnished for or installed as part of the contract.

Warrant the satisfactory in-service operation of the mechanical equipment, material, products, and related components for a period of one year following the date of final acceptance of the Project.

C.6 Erection

Submit calculations for each stage of construction, and drawings and procedures detailing the intended scheme for installing all machinery. Perform machinery installation in a coordinated manner to ensure all the components fit with the adjacent material.

C.6.1 Alignment and Bolting

Perform the order of assembly and alignment of bridge machinery per an approved installation procedure. To achieve proper alignment of mating components prior to final reaming and fastening, limit the finality of some staged machinery installations.

Match-mark all parts of the machinery for proper assembly and correct orientation. Before final drilling or reaming, adjust all parts to exact alignment by means of shims. If required, provide tapered shims at contractor's expense. Include installation, alignment, and shimming of the electric motors and devices such as limit switches and encoders, with the machinery for such erection. Ensure all parts operate smoothly after final alignment and bolting.

Do not operate the span via the bridge machinery until all components are installed, in final alignment, and bolted as approved by the engineer.

In general, after final alignment of machinery, drill bolt holes into the structural steel from the solid for connecting machinery. For erection and alignment of machinery, use sufficient erection holes, sub-drilled 1/4-inch (6.35 mm) undersize for undersized temporary bolts. As the machinery is aligned in its final position, drill full-size holes for the remaining bolts, or sub-drill and ream; install the full-size bolts; and remove the temporary bolts. Ream full-size the undersized holes (used for temporary bolts) and install full-size bolts.

Drill and ream assembled bolt holes in structural steel and machinery components (with shims in place) to assure accurate alignment of the hole and accurate clearance over the entire length of the bolt within the specified limit. Check the clearance with 0.011-inch (0.28 mm) wire. The hole is considered too large if the wire can be inserted in the hole together with the bolt. Connect machinery components to structural elements or to other machinery components comprised of different thickness using high-strength bolts. Wherever possible, install the bolts such that the head is adjacent to the connected element with the least thickness.

Handheld reamers are not considered accurate enough; use a reaming jig to keep the bolt holes cylindrical. Use a jig made of structural steel, fixed to the drill, and secured to the work preventing the reamer shaft from deviating. Check holes with a bolt hole micrometer to assure uniform diameter.

Torque finished body high-strength bolts meeting the requirements of ASTM A449 to the same tension required for ASTM A325 bolts.

Indicate torque values for other classes of bolts on the erection drawings proportioned to their strength.

C.6.2 Coatings

Coat threads for turned bolts with anti-seize compound before assembly with nuts to prevent corrosion or galling, and to facilitate future removal.

C.6.3 Edges and Corners

Round or chamfer all edges and corners of machinery parts, sheet metal work, bed plates, and fabricated supports that are exposed in the finished work. Remove all burrs or other surface defects that could be injurious to workers erecting or maintaining the bridge machinery.

C.6.4 Personnel and Facilities

Use competent millwrights that are skilled in the type of work involved to erect and adjust the machinery. Provide them with all necessary measuring and leveling instruments, as required.

C.7 Painting

Clean and paint all unfinished surfaces of machinery, as specified in Standard Painting Specifications. Along with the shop drawings, submit an outline of painting materials and methods for review.

C.7.1 Shop Painting

During final preparation, prior to painting, blast clean all external surfaces of unfinished machinery according to the requirements of SSPC-SP6, Commercial Blast Cleaning, with the following exceptions:

- Sleeve bearings with bushings in place
- Electric motors
- Limit switches
- Other equipment with shaft seals
- The equipment excepted by the engineer

Clean the excepted machinery or equipment with solvent and hand tools to meet the requirements of SSPC-SP2, Hand Tool Cleaning as depicted in SSPC VIS 1.

After proper surface preparation, give one shop coat of primer by hand brushing to all unfinished machinery surfaces except pillow blocks. The modified aluminum epoxy mastic primer, Carbomastic 15 or approved equal, must be compatible with the paints selected for subsequent coats.

For non-mating surfaces that receive a shop coat of primer but become inaccessible once the erection process begins, these surfaces shall also receive a shop applied intermediate coat to complement the below field painting requirements.

C.7.2 Field Painting

After erection is complete, thoroughly clean all exposed surfaces of the machinery (except machine finished surfaces in sliding contact), with an approved high-flash solvent and apply intermediate coat by hand brushing. The aliphatic acrylic polyurethane, Carbothane 134 HG or approved equal, must be compatible with the finish coat. Provide an intermediate coat that is resistant to weathering (marine environment) and abrasion and free of lead.

After field testing is complete, but prior to final acceptance of machinery, re-clean all exposed surfaces of the machinery (except machine finished surfaces in sliding contact), with an approved high-flash solvent and apply a finish coat by hand brushing. The aliphatic acrylic polyurethane, Carbothane 134 HG or approved equal, must be compatible with previous coats. Match the finish coat to that of the structural steel.

Use paint for the finish coat, which is compatible with the intermediate field coat; high-gloss, resistant to weathering and abrasion. Submit the brand and colors to the engineer for approval.

Take special care to avoid painting machinery surfaces, which are in normal rubbing contact. Mask, for protection from paint, all nameplates, legend plates, and escutcheons mounted on machinery. Keep lubrication fittings clog-free.

C.8 Contractor's Inspection

After erection is complete, make a thorough inspection to ensure that all mating surfaces are clean and free of obstruction, that all parts are properly aligned and adjusted as closely as practicable without actual operation; that all bolts are properly tightened; and that the span is properly balanced.

Inspect tightened fasteners according to the Structural Steel Standard Specification. Verify that field painting has been performed as specified herein. Perform touch-up painting to correct all painting defects found during this inspection.

Verify that all rotating and sliding parts are supplied with lubricants as recommended by the manufacturers of the units. Typical products for the various locations are as follows:

- Sleeve Bearings and Pillow Blocks: NGLI #2 Grease

Prior to machinery testing, the engineer will accompany the contractor during his final inspection. On the basis of the results of this inspection, the engineer determines whether the bridge is ready for field testing.

C.9 Field Testing

When the mechanical components and electrical equipment are ready for final testing, inform the engineer not less than fifteen (15) calendar days prior to the scheduling of tests. During all tests, keep available a complete crew of mechanics in order to provide operation of the span and to make all adjustments and corrections, which are required to complete the tests.

Prepare a field-testing procedure and submit to the engineer for review and approval. Coordinate the testing procedure with tests required for the electrical equipment and include measurements of power and current drawn by the motors when operating under load as required hereinafter.

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

- Hydraulic Power Unit
- Bridge Lift Cylinders
- Tail Lock Assemblies
- Machinery Instrument Drives and Limit Switches

When the machinery is ready for field testing, drive the machinery assemblies under normal, auxiliary and manual operations. During normal operation, use the main electric power to cycle the operating machinery and bridge seats in the proper sequence to raise/lower the lift span ten times. During normal operation, use both electric motors to cycle the operating machinery. During auxiliary operation, use the backup service and one motor to perform the same.

During manual operation, demonstrate the use of manual features used to seat the bridge in case of emergency five times.

During the test runs, inspect each machinery assembly in its entirety to determine whether everything is in proper working order and fully meets the requirements of these Special Provisions, plans, and manufacturers' recommended tolerances. Perform all test runs in the presence of the machinery manufacturer's representative, the electrical control equipment manufacturer's representative, and the engineer. Ensure that the temperature rise of all electrical/hydraulic components do not exceed design ratings. If any test shows that the components are defective, inadequate, or functioning improperly, make all corrections and adjustments, or provide the replacements required before final acceptance, at contractor's expense.

D Measurement

The requirements described in this Special Provision will not be measured separately for payment but are incidental to the pay item MECHANICAL WORK.

E (Vacant)

28. Mechanical Work, Item SPV.0060.02.

A Description

A.1 Scope of Work

The work under this item consists of designing, furnishing, installing, and placing in satisfactory operating condition all mechanical equipment for hydraulic operation of the bridge. The major parts of this construction include but are not limited to, modifications to the existing hydraulic power units, piping, bridge operating cylinders, tail lock cylinders and fluid heating/filtering loops.

Details and arrangements of the Hydraulic equipment are shown on the plans or specified herein.

The work includes installing all hydraulic equipment according to the special provision GENERAL MACHINERY.

Coordinate the hydraulic equipment installation with all other machinery items, electrical work, and structural work, as well as other facility construction works.

B Materials

B.1 Hydraulic Power Unit (HPU)

Flush the existing HPUs to a cleanliness level of ISO 16/14/12.

B.1.1 Hydraulic Power Unit Hardware

Provide fastener bolts, nuts, washers and other mounting hardware mounted on the hydraulic power units of similar material, i.e., type 316 stainless steel, unless otherwise approved.

B.2 Hydraulic Cylinders and Accessories

Provide new hydraulic cylinders as specified on the plans or approved equal and conforming to ISO 4413, Section 5.4.2.

Provide hydraulic cylinders that are rated for 3,000 psi and a factor of safety of 3.00 against static failure pressure and buckling as per the 2007 AASHTO LRFD Movable Highway Bridge Design Specifications, 2nd Edition with all interim revisions.

Provide hydraulic cylinders by one of the following manufacturers, or an approved equal:

- Parker
- Eaton
- Hunger
- Rexroth

B.3 Hydraulic Pumps

Provide hydraulic pumps that are an in-kind replacement of the existing pumps. Any modifications required to incorporate the new pumps is considered incidental to the work.

B.4 Hydraulic Piping and Tubing

Provide hydraulic piping material that is seamless, low carbon stainless steel conforming to ASTM A312, type 316L.

Provide hydraulic tubing material that is seamless, annealed, low carbon stainless steel conforming to ASTM A269, type 316L, ISO 10763, and ANSI B31.1 standards. Use a maximum tubing size of 1.5 in nominal unless otherwise specified.

Design piping and tubing such that the allowable working stresses established in ASME B31.1 are not exceeded at the maximum working pressure.

Unless otherwise specified or approved, install all piping parallel or perpendicular to walls, floors and ceilings. Install plumb, level and square. Place the new piping in locations to not interfere with access to any equipment for maintenance (disassembly or in-kind replacement), lubrication, or cleaning. Install piping to meet all NEC workspace clearances for new and existing equipment.

B.5 Hydraulic Pipe and Tube Supports

Provide hydraulic pipe and tube supports that are cushion clamp systems as manufactured by Stauff, Hydac, Hydra-Zorb Company or approved equal. Provide clamps, fasteners, and channels that are 316 series stainless steel. Provide support spacing and locations according to ISO 4413, Section 5.4.6 and ASME B31.1.

B.6 Pipe/Tube Fittings

Provide pipe and tube fittings of similar materials to the pipes/tubes in which they are fitted. Acceptable welded pipe fittings are 37° flare type or SAE straight thread O-ring type for sizes up to and including 1.5 inch NPS. Provide mating 37° surfaces with an O-ring and O-ring boss for leak-free connections. Use a captive O-ring pressure seal system for connections greater than 1.5 inch NPS, butt welded or welded four-bolt flanges. Provide flange fitting materials that are similar to the flange materials. Provide locking washers for flange bolts. Do not use pipe threads on any portion of the system where pressures exceed 200 psi. Where pipe threads are permitted (200 psi and below), pipe sealant is not permitted.

For tube connections use 37° flared fittings. Use an O-ring and O-ring boss to provide a leak-free connection for the mating 37° surfaces. Use a maximum allowable tubing size of 1.5 inch OD (outside diameter) unless otherwise specified.

The following standards apply for pipe and tube fittings:

- SAE J514 for JIC 37° fittings
- SAE J514 for O-Ring Boss (ORB) fittings
- SAE J1453 for O-Ring Face Seal (ORFS) fittings
- SAE J518 for Flanges

Only use butt-welded, four bolt flange pipe/fittings for pipe running across the pier and any other locations that are not readily accessible and/or capable of leaking directly into the waterway.

Use of proprietary connections such as Parflange or Walform is acceptable provided the proposed connection type is submitted for review and approval.

B.7 Hydraulic Pipe Welding

Weld and test hydraulic pipe according to ASME B31.1.Show welding joint sizes and details on shop/working drawings. Submit weld procedures with the shop/working drawing.

B.8 Flexible Hose

Provide flexible hose material that is “hydraulic duty”. Use SAE J517 to determine the maximum allowable operating pressure for the hose. Design hoses for an operating pressure of 3000psi. Provide shop assembled hose assemblies by the hose supplier. Use consistent hose lengths where practical.

Provide hose end connections that are Type 304 stainless steel for 37° female JIC swivel connections or Type 316 stainless steel for four-bolt, O-ring flange connections. Provide flange dimensions according to SAE J518. Provide flange bolts with locking washers and hose fittings that conform to SAE J516 standards.

Provide restrained or confined flexible hoses in all cases where a hose failure would constitute a hazard.

B.9 Valves

Provide valves with stainless steel bodies and conforming to ISO 4413, Section 5.4.4. Provide manual overrides for all valves required for span movement.

Provide adjustable valves that are equipped with protective caps or locking nuts on the adjusting screws to prevent unintentional misadjustment. Clearly identify set points on the valves.

Provide directional control valves and blocking valves with adjustable pilot control chokes to increase valve opening and closing time for shock and surge pressure control.

B.11 Filtration and Fluid Conditioning

Provide filtration and fluid conditioning according to ISO 4413. Equip all filters and strainers with an indicator to show when the filter requires servicing.

Provide the degree and quality of filtration to meet the cleanliness requirements provided herein. Provide filters bypass valves as required by the Plans. Provide filter flow capacity ratings as recommended by the pump manufacturer.

B.12 Pressure Indicators

Provide gages of durable construction with dial faces clearly calibrated for pressure ranges 50% and beyond the maximum design operating pressures of the hydraulic system. Provide gages that are accurate and that permit continuous monitoring. Provide gages with a minimum diameter of 3 inches, and preferably 4 inches. Provide shutoff valves at each gage.

Provide portable gages for maintenance and adjustment of the hydraulic system with pressure ranges that cover all possible values that will be needed. Provide one gage for each pressure range such that the test pressure will be within the mid-half of the total pressure range of the gage. Provide quick-disconnect type connections for portable gages. Provide test ports equipped with removable, protective caps, secured by chains to the component. Provide shutoff valves at each test port. Provide test ports at all locations that can be pressurized without a permanent pressure gage indicating the pressure.

B.13 Nameplates

Provide hydraulic cylinders with engraved permanent stainless steel nameplates which are securely attached to the head of the cylinder. Clearly indicate the manufacturer, model number, cylinder bore, rod diameter, stroke length, pressure rating, and a list of nonstandard features on the name plate.

Provide nameplates for each control valve indicating the name and function of the valve. Show the manufacturer part number on the nameplate. Provide either engraved stainless steel or a lamicoid nameplates showing white characters on a black background or black characters on a white background.

Provide nameplates for each adjustable hydraulic component. Indicate the name, function, set point, and manufacturer part number for the component.

Meet the requirements of ISO 4413 Section 7.4 Marking and Identification.

Utilize a unique identifier for each component on each nameplate to allow the item to be cross-referenced on the hydraulic schematic.

B.14 Manifolds

Provide 316 stainless steel Manifolds according to ISO 4413.

B.15 Hydraulic Fluid

Utilize the same hydraulic fluid used in the existing system.

B.16 Quick Disconnects

Do not use quick disconnects except where specified herein.

B.17 Bends

Utilize 5D bends or greater where practicable to eliminate pipe joints. Do not use bends of any lesser radius.

B.18 Spare Parts

Package and lubricate spare parts for long term storage.

Provide the following spare parts in addition to the spare parts described under other items:

- Four sets of replacements seals for the main drive cylinders.
- Four sets of replacement seals for the tail lock cylinders.

C Construction

C.1 Shop Assembly and Operation

Shop test the pumps prior to installation. Verify that the pumps match the existing pump settings. Verify flow and pressure.

Submit shop test procedures for review and approval by the engineer. Provide test procedures with sufficient detail to show that all of the requirements from the contract documents are being met.

Pressure test custom manifolds to 3 times the maximum working pressure. This requirement does not apply to commercial manifolds that are rated for the maximum working pressure.

Verity the settings for all adjustable hydraulic components and record results during shop testing.

Test hydraulic cylinders at the manufacturer before shipment to the site. Include a 30 minute static pressure test in both the extended and retracted position at 1.5 times the maximum working pressure per the latest AASHTO Movable Bridge Design Specifications with interims section 7.8.4.2.2. Provide the catalog rating certification to the engineer.

C.2 Installation Sequence

Installation of the hydraulic equipment includes installing, aligning, and testing the complete hydraulic systems. Prior to the start of any installation work, submit a procedure to the engineer for review and approval.

Verify and maintain the required cleanliness level of the hydraulic fluid at all times. In the event of a deficient report, filter the oil and resample. Filtering and resampling shall be at the expense of the contractor.

After the cylinder is installed, install new spring hanger. Provide all hardware required to install the spring hanger and paint/lubricate to provide long life in a marine environment. Set the spring hanger as follows:

a) Install snug tight with the cylinder fully retracted (bridge in the fully raised position).
b) Measure the movement in the spring hanger when lowering the bridge to the fully seated position.
c) If movement is 1/16” or less, no additional adjustments are required. If movement is greater than 1/16”, tighten the spring by ¼ of the movement in the spring hanger. Retract cylinder and confirm that the spring does not raise the cylinder beyond the initial elevation.
d) Perform steps (b) and (c) as needed to determine the ideal setting of the spring hanger. The ideal setting will minimize the amount of sag when the cylinder is extended while not raising the cylinder from the initial position when the cylinder is retracted.

C.3 Field Testing

When the mechanical machinery and electrical equipment are ready for final testing, submit to the engineer a testing procedure and schedule at least two weeks in advance.

Remove the existing hydraulic fluid, properly discard, replace with new fluid, and air bleed the entire hydraulic system. While the fluid is being changed, flush and clean the reservoir. Add new fluid and filter during filling to maintain the required cleanliness level. Fill the reservoirs with fluid to the correct level.

Inspect equipment for external leakage during the tests and determine whether all features are in proper working order and adjustment, and whether they meet the requirements of the drawings and specifications. Use portable pressure gages at all test stations of the hydraulic system, including the power unit. Correct leaks of any kind.

Closely monitor the hydraulic fluid level in the reservoirs during all tests. Maintain proper fluid level at all times to prevent pump cavitation or drawing air. Bleed air from the hydraulic system and make-up fluid added to the reservoir as required. Filter hydraulic fluid during filling to maintain the required cleanliness level. In the event tests show that any features are defective or inadequate, or function improperly, make all necessary corrections, adjustments, or replacements.

When all the components are in proper working order and adjustment, record the pressure readings taken at each test station and provide to the engineer.

After completion of final tests, take fluid samples from each reservoir for analysis by the fluid supplier. Change the fluid if sample contamination levels are greater than the requirements for new fluid. Add new fluid where required and filter during filling to maintain the required cleanliness level.

Replace filter elements and clean strainers and magnets after completion of final hydraulic testing, and either fluid replacement or the continued use of fluid which has passed contamination level testing.

Pressure test all field piping for a minimum of 30 minutes at the relief setting.

C.4 Submittals

Provide a hydraulic schematic for review and approval that conforms to the requirements of ISO 4413. At a minimum, provide the following with the hydraulic schematic:

- An item name and description for all components.
- Design set points for all adjustable components.
- Item numbers and call outs for all components

Provide piping diagrams conforming to the requirements of ISO 4413 for review and approval by the engineer. Provide drawings with a complete pipe and fitting schedule. Provide descriptions in the pipe and fitting schedules that have sufficient detail such that all items can be replaced without the original stock numbers.

Provide piping layouts and assembly drawings conforming to the requirements of ISO 4413 for the hydraulic system. Clearly indicate the type and spacing of piping supports. Submit the drawings for review and approved by the engineer before field erection.

Provide a flushing procedure for review and approval that describes the flushing loop(s), flushing flow rates, durations, and required cleanliness level.

Provide assembly and detail drawings for all machinery components that are sufficiently complete such that the machinery parts may be duplicated without reference to patterns, other drawings, or individual shop practice. Review and approval by the engineer is required prior to purchasing any materials. This requirement includes any custom hydraulic components.

Provide cutsheets for all commercial components that indicate the full part number of the components. Include all of the catalog sheets for the component with the cutsheet submittal. Review and approval of cutsheets by the engineer is required prior to purchasing any materials.

Submit certified test data to the engineer for approval before shipment to the bridge site. Testing requirements are provided herein.

Provide certified dimension prints of the apparatus that states in the certification the name of the job, the application of the apparatus, assembly/part designation, number required, right-hand or left-hand assembly, material, finish, and any other pertinent data to show that the apparatus meets the specified requirements.

Do not ship equipment to the job site until the submittals are approved.

Upon completion of the work, correct all shop or working drawings to show the work as constructed and provide As-Built copies to the Owner. Include dimensioned assembly views and all dimensions, tolerances, fit, and finishes of all parts manufactured and installed on the bridge by the contractor.

Furnish the owner with Operations and Maintenance manuals per the requirements of the section GENERAL MACHINERY. Organize all manuals such that all operations, maintenance procedures, lubrication charts, and drawings are in the front of the manual. Locate backup data such as cut sheets and standard equipment data in an appendix.

Provide lubrication charts for review and approval and include bearings, electrical equipment, and all other elements of the bridge which require lubrication. Provide the recommended lubricant and the frequency of lubrication on the charts. Detail any purge plugs that need to be removed prior to lubrication. Provide 24”x36” large format lubrication charts framed and covered with plexi-glass for the bridge and mount at a location chosen by the owner.

Submit to the engineer for review and approval all the aforementioned submittals. In case of correction or rejection, resubmit until they are approved. The contractor is responsible for all costs which may result from the ordering of any materials prior to the required approval. Do not perform work until the submittals have been approved.

D Measurement

The department will measure Mechanical Work 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. 0060.02	Mechanical Work	EACH

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

Submit to the engineer a detailed breakdown of costs under this item. The engineer will evaluate this breakdown, and has the authority to revise the breakdown as, in his/her judgment, may be required to make the various components of work conform to their true values.

The contractor agrees that the detailed breakdown will not become effective until it has been approved by the engineer.

The approved detailed breakdown will be used as a basis of payment for the progress payments. The progress payments for Item “Mechanical Work” will be made according to the department’s standard payment practices and in the following manner:

Upon completion and acceptance by the department of shop fabrication, shop inspection, shop testing, and delivery and storage of materials, the contractor will be paid 30% of the bid price for the item.

Upon completion and acceptance by the department of the hydraulic power unit, hydraulic cylinders, and piping as a complete installation including alignment, bolting, and protection of materials, the contractor will be paid 20% of the bid price for the item.

Upon completion and final acceptance by the department of the hydraulic system inspection and field testing, the contractor will be paid 40% of the bid price for the item.

Upon completion of training and receipt and acceptance of approved Operating and Maintenance Manuals, the contractor will be paid the remaining 10% of the bid price for the item.

29. Replace HPU Enclosures, Item SPV.0060.03.

A Description

This work includes furnishing, fabricating and erecting self-supporting prefabricated hydraulic power unit (HPU) enclosure buildings on the bascule piers.

B Materials

Use durable materials suitable for outdoor marine environments, such as Fiberglass Reinforced Polymer (FRP) or equivalent.

The enclosure walls and roof shall be 4 inches thick, providing a minimum insulation value of R-14. Insulation must be rigid closed-cell polyisocyanurate.

Materials must meet minimum standards for flame spread and smoke developed indices to ensure safety and compliance with national fire safety regulations.

B.1 Doors

Doors shall be made of fiberglass reinforced polymer (FRP).

Doors shall be 1-3/4 inch thick.

Doors shall be hung with stainless steel ball bearing type hinges equipped with tamper-resistant, non-removable pins. Hinges shall be oriented with no fasteners exposed when door is closed.

Doors shall be sealed with a weather-tight EPDM gasket along the entire perimeter of the door.

Doors shall have rain drip molding located above.

Doors must be able to be set in ‘open’ position with no hands. Doors must be able to be removed from ‘open’ position and closed with no hands. Doors must have hydraulic closer to prevent wind damage to door.

C Construction

C.1 Removal and Demolition

Remove the existing HPU enclosures and demolish the existing concrete curb as indicated on the plans.

Existing Hydraulic Power Units will remain in place during enclosure removal. Existing electrical boxes, conduits, and components are to remain in place and require temporary support during demolition and erection efforts. Temporary support of existing components is covered under special provision: Bridge Electrical Work

Ensure all existing machinery and electrical components are adequately covered and protected throughout the demolition and erection process.

C.2 Fabrication

Perform field measurements of the enclosure locations and check clearances to the moving bridge leaf prior to fabrication. Fabricate the HPU enclosures with the dimensions shown on the plans or adjusted as required based on field measurements. Perform all work for this item according to all applicable requirements of the standard specifications except as modified herein or shown on the plans. HPU enclosure must be fabricated and installed such that all joints, seams and base connections are weather-tight from the inside so that any accidental liquid spray inside the HPU enclosure remains inside and does not escape the outside of the enclosure. Provide necessary gasketing, flashing, caulking, etc to achieve this.

Submit detailed shop/fabrication and installation drawings to the engineer for approval prior to fabrication.

Construct the enclosures to comply with all applicable local building codes and design them to withstand all relevant structural loads as per ASCE 7-22, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

C.3 Installation

Install the HPU enclosures on the new concrete curbs working around the existing mechanical, hydraulic and electrical components. Connect the enclosures to the concrete curb by manufacturer approved methods.

The first time the bascule leaf is moved following rehabilitation, 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.

C.4 Penetrations, Louvers, and Openings

Ensure all penetrations, louvers, and openings are accurately prefabricated or field cut to match the field conditions and plans. Provide seals and gaskets as necessary to maintain insulation and weatherproofing integrity. Seal field cut holes and openings by manufacturer approved methods.

Provide louvers with insect screens as manufactured and supplied by the manufacturer.

Penetrations, louvers, and openings must be fabricated such that all joints and seams are weather-tight from the inside so that any accidental liquid spray inside the HPU enclosure does not escape the enclosure.

D Measurement

The department will measure Replace HPU Enclosures by each HPU Enclosure, acceptably 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. 0060.03	Replace HPU Enclosures	EACH

Payment is full compensation for furnishing and erecting the new HPU enclosures, including all materials, labor, tools, equipment, and incidentals necessary to complete the work. The cost of field drilling holes for penetrations and openings and all associated seals and gaskets will be considered included in this payment. The removal of the old enclosures and demolition of the existing concrete curb is also included in this payment.

30. Balance Bascule Bridge Leaves, Item SPV.0060.04.

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 plates and 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 hydraulic cylinder pressure measurements technique 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.

Take full responsibility for the correctness of balancing calculations and placement or adjustment of blocks and plates so that when completed the bridge will be in proper balance.

B Materials

Provide all necessary materials and equipment required to perform balance calculations, span balance adjustments and span balance measurement as described below.

Additional balance blocks are available at other bridges in the Northeast Region if needed. Work with WisDOT to coordinate pick-up or delivery of additional balance blocks.

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 plates and concrete balance blocks to be added, removed and/or adjusted within the counterweight pockets and rear of counterweight 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 steel grid decks, and existing and new steel members.

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 proposed 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

Add or remove the required number of steel plates and concrete blocks to or from the counterweight pockets or back of counterweight as shown on the plans. Perform steel plate removals first and perform test openings in the presence of the engineer. Do not perform counterweight block adjustments until approval is given by the engineer. An approximate potential number of steel plates and concrete blocks to be placed or removed in each of the counterweight pockets and attached or removed to the counterweight based on assumed and theoretical weights of components to be added and removed from each of the bascule leaves is provided in the plans for order of magnitude reference only. Base the actual number of blocks and plates to be added, removed, reinstalled, or relocated on span balance calculations and span balance testing.

Excess Blocks and Plates - Balance blocks removed from the counterweight and not used to balance the bridge are the property of the department. Move excess balance blocks to storage on site as directed by the engineer. Steel plates removed from the back of the counterweight and not used to balance the bridge are the property of the department. Deliver excess steel plates to a location in the Northeast Region at the department's direction.

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. Use the results of this test to prepare balance calculations for each leaf.

Initial – Test the span balance after leaf rehabilitation is completed including changes to balance plates and blocks based on submitted span balance computations, to determine the balance condition and to determine any required additional adjustments by adding, removing, reinstalling, or relocating balance blocks or plates. 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/plate 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 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 hydraulic cylinder pressure measurement technique. Furnish and install all equipment, materials, instruments, and labor necessary to determine the imbalance by these methods.

Employ the services of an established testing company experienced in dynamic hydraulic cylinder pressure 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 hydraulic cylinder pressure 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 hydraulic cylinder pressure measurement procedure.

Furnish and install the required transducers, testing equipment, 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 the procedure including type and method of installation of hydraulic pressure transducers, method of transmission of low level signals, data acquisition equipment and/or strip chart recorders
- Layout of span drive machinery showing proposed location of transducers, power supplies, cable or radio links, data acquisition equipment and all associated cabling.
- Wiring diagrams of interconnection of pressure transducers, power supplies, data acquisition equipment and strip chart recorders and sample computations of: hydraulic pressures to forces, span imbalance, curve fitting and basis for friction correction.

Connect 5000 pounds per square inch hydraulic pressure transducers to the blind and rod end test ports of both main hydraulic cylinders for a total of four transducers, per leaf. Use transducers with accuracies not less than 0.5 percent full-scale output. Use output voltage/current compatible with the data acquisition/strip chart recorder utilized. Use transducer power supply as recommended by the manufacturer.

Connect output leads from each transducer to either the computer-based data logger streaming the data to disk at a minimum 1000 hertz sample rate or a five channel minimum strip chart recorder with at least 10 inch wide chart paper. Provide an inclinometer to record continuous leaf angle to either the data logging equipment or the strip chart recorder. Use an adjustable chart speed with a setting of at least 10 inches per minute. Use a recorder capable of recording data from at least four channels if it is equipped with a dedicated event marker or five channels if a channel is used to record events.

Record simultaneously the blind and rod end pressures of both main hydraulic cylinders versus span opening angle to a suitable scale. Use the same scale and the chart speed for all transducers, if a strip chart recorder is used. Make at least three opening/closing runs, when the wind speed is less than five miles per hour and the bridge deck is visibly dry. Prior to taking measurements ensure that all air is bled from the system.

Convert cylinder pressures to force by applying fundamental hydraulic system relationship calculations for each plot for both opening and closing. Use the constant velocity region. Process the data to give leaf imbalance (kip-feet) versus opening angle, corrected for friction, about the center of roll. Prepare plots of total span imbalance

Submit one copy of the report documenting the results of the dynamic hydraulic cylinder pressure measurements electronically. Separate reports are required for each leaf. Report the following:

Description of procedure and equipment used.

- Scans 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. They must be annotated with pressure scales, angle of opening, significant ordinates, etc.
- Description of relationships and sample calculations for obtaining force from pressure, span imbalance, 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:
    1. Individual cylinder imbalance moment.
    2. Total imbalance (kip-feet) for each leaf.
    3. Frictional moment (kip-feet) for each leaf.
- 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 final balance plate/block adjustment, submit one copy of the final report similar to the initial report electronically. 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.

Final balancing will be subject to the approval of the engineer. All necessary adjustment and materials which may be required will be considered as part of the work.

C.5 Bascule Leaf Balance Acceptance Criteria

The final acceptable balance condition measured by the procedures described herein will be considered acceptable when 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 2,000 pounds and no greater than 3,000 pounds.
- The composite center of gravity of each bascule leaf including its counterweight is between negative 20 degrees and positive 20 degrees from a horizontal line extending from the Center of Roll.
- Each leaf tends to drift closed at any angle of opening.

D Measurement

The department will measure Balance Bascule Bridge 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. 0060.04	Balance Bascule Bridge Leaves	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, reinstalling, and/or adjusting the location of balance blocks or plates as many times as necessary to achieve an accepted final balance for both bascule bridge leaves.

31. Replace Operator House Windows and Door, Item SPV.0060.05.

A Description

This special provision describes providing all materials, labor, and equipment necessary to remove the existing operator house windows, to furnish and install new windows, and to remove and replace one steel door at the utility room level.

B Materials

Provide materials according to the standard specifications, North American Fenestration Standard/Specification (NAFS), and as specified herein. Provide windows from a single manufacturer. Fabricate, assemble, finish, apply hardware, and perform other work in the factory to the greatest extent possible. Disassemble components only as necessary for shipment and installation.

B.1 Windows

Provide windows constructed of aluminum frames and sashes with glass glazings. Adhere to dimensions shown on the plans. Ensure the windows satisfy the following requirements and are labeled with an American Architectural Manufacturers Association (AAMA) certification.

B.2 Performance Requirements

Comply with AAMA/WDMA/CSA 101/I.S.2/A440 unless otherwise specified. Ensure windows meet Performance Class AW and Performance Grade 40. Ensure the thermal transmittance is NFRC 100 maximum whole-window U-factor of 0.30 Btu/sft x hr x deg F. Test windows for thermal performance according to AAMA 1503 showing a condensation-resistance factor of 45. Ensure windows allow for thermal movements from a temperature range of 120°F ambient and 180°F material surfaces, preventing detrimental effects. Ensure windows are not rated less than 30 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

B.3 Components

Frames and sashes fabricated from 6063-T5 aluminum extrusions with a low-conductance thermal barrier. Frame and sash wall thickness at least 0.125 inches. Aluminum with an ultimate tensile strength not less than 22,000 psi. Insulating glass units conforming to ASTM E 2190 with fully tempered clear glass, Argon gas fill, two lites, and Pyrolytic Low-E coating on the second surface. Manufacturer's standard hardware fabricated from corrosion-resistant materials. Non-friction type hinges, lever handle and cam-action lock, full perimeter weather stripping, non-corrosive fasteners. Extruded aluminum column covers, interior trim, and panning trim as needed.

B.4 Finish

Finish exposed aluminum components with a two-coat shop-applied high-performance 70 percent PVDF coating, color matching Federal Standard 595C color number 24201.

B.5 Joint Sealant

Type S, Grade NS, Class 100/50, NT neutral curing non-staining silicone joint sealant conforming to ASTM C 920, with a color matching the windows. Provide primer as recommended by the joint sealant manufacturer.

B.6 Backer Rod

Type C closed-cell material conforming to ASTM C 1330.

B.7 Warranty

The manufacturer agrees to repair or replace windows that fail in materials or workmanship within the warranty period: 10 years for windows, 20 years for glazing units, and 20 years for finishes.

B.8 Metal Door

Provide a door that is full flush design, 1-3/4" thick, 18 gauge steel face panel with an electrolytic zinc coating meeting the requirements of ASTM A591, Class C. Provide a one piece full honeycomb core securely bonded to both face sheets. Door edges mechanically interlocked. Seamless face sheets. Provide top and bottom channels that are No. 16 gauge steel positioned flush with face sheets. Hinge reinforcing shall be No. 10 gauge steel.

B.9 Paint

Door shall be bonderized to ensure the proper adhesion of the shop prime coat to the substrate. Areas where the zinc coating has been damaged by the fabrication process shall be touched-up with a zinc-rich paint before priming. The shop prime coat shall be a gray alkyd resin-iron oxide paint having a high chromate content. It shall be oven dried and tested to ASTM Specifications D-714 and B-117 for humidity cabinet and salt spray tests. The paint shall have good adhesion, high flexibility, and the ability to resist scuffing and scratching during transit and installation. The finish color shall be 26293 (light gray), according to Federal Standard Number 595B, as printed in 1989. The contractor shall ensure that the shop paint is compatible with the field-applied intermediate and finish coats. Shop coat shall include all surfaces, including those inaccessible after installation.

B.10 Lock

Provide a door lock that is keyed from the outside (machinery area) and push button actuated from the inside (operator house) similar to existing door.

B.11 Hardware

Hardware sets for doors are shown using catalog plate numbers of the manufacturers shown below. Equal products of Stanley, Baldwin, Schlage, and Hager may be used, subject to approval of the engineer. All hardware shall be brushed stainless steel unless noted otherwise.

- Hinges: Stanley FBB191
- Locks: Yale Security Inc. AU5400 & 8700 Series
- Kick Plates: Hager
- Thresholds: Schlegel Hydrosill
- Weatherstripping: Schlegel Q-Lon
- Door Stops: Ives

- Closer: Yale Security Inc. 50 series with backcheck
- Door Sweep: Schlegel

B.12 Templates, Data, Etc.

Furnish the door manufacturer with all templates and necessary information relative to cutting out and reinforcing for the installation of locksets, butts, etc. Determine need and location of door stops, etc., subject to the approval of the engineer.

B.13 Hinges

All hinges shall be five knuckle, flush ball bearing design, with wide spaced bearings. Thoroughly lubricate bearing assemblies. Ball bearings to be of chrome alloy material, thoroughly hardened. All full mortise hinges to have a hole in the bottom tip for easy pin removal except for non-removable pin.

B.14 Hardware Set

1 1/2 Pair 5" x 5", Full Mortise, S.S. butt hinges 1 Lockset MO 5404 LN (613e) 1 PA55A-BC Closer w/optional positive stop 1 Kick Plate 12" x 35" 1 Threshold 1 Weatherstripping 1 Door Sweep 1 Floor Stop

B.15 Window Roller Shades

Equip the windows in the operator room with dual window shades. The outer shade (mounted nearest the glass) shall be a light filtering shade, and the inner shade shall be a room darkening shade. Equip the windows at the lower level with room darkening shades only. Furnish seamless shades of a high quality commercial grade acceptable to the engineer.

B.15.1 Light Filtering Shades

Furnish light filtering shades made of 3.5 mil minimum Mylar fabric with a sputtered metalized surface. The sputtered metalized surface shall be charcoal/silver-CS69 with the following characteristics:

Percent solar energy transmission: 15 ±

Percent solar energy absorption: 35 ±

Percent solar energy reflectance: 50 ±

Percent UV transmission: 2 ±

Percent visible light transmission: 12 ±

B.15.2 Room Darkening Shades

Furnish room darkening shades made of fabric woven from extruded vinyl over a fiberglass or polyester core. Fabric must hang straight and flat, without buckling or distortion, and when trimmed, the fabric edge must remain straight and free of raveling. Fabric shall be closed weave to provide a room darkening capability. Fabric shall be flame retardant and shall be fade resistant to commercially accepted standards. Variations in fiber density and striations inherent in woven fabrics shall be within commercially accepted standards. Provide beige shades.

B.16 Insect Screens

For single hung and horizontal sliding windows provide insect screens that integrate with the window frame. Do not use screen wickets.

Use the manufacturer’s standard aluminum alloy complying with Screen Manufacturers Association (SMA) 1004 or SMA 1201 for frames. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable polyvinyl chloride (PVC) spline/anchor concealing edge of frame. Secure the screen with aluminum lift-off clips.

Use 18 by 16 mesh of PVC-coated glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Ensure the mesh complies with ASTM D 3656. Ensure the finished color of the mesh is black.

C Construction

Perform the work according to the standard specifications, NAFS, manufacturer’s recommendations, and as specified herein. Field-measure the existing operator house window openings and utility room door prior to the start of work to determine exact sizes.

C.1 Removals

Remove the existing windows, shades, screens, and door as designated on the plans. Temporarily cover window and door openings to prevent weather intrusion.

C.2 Preparation

Remove foreign material from joint substrates that could interfere with adhesion of joint sealant. Clean porous and non-porous joint substrate surfaces according to specifications.

C.3 Submittals

Submit material samples of all materials to the engineer for review and approval a minimum of 14 days prior to the work. Provide test data certification for all materials and components.

C.4 Window and Door Installation

Submit the window and door manufacturer's working drawings and recommendations for approval. Install windows and door according to the manufacturer’s instructions, ensuring proper relation to wall flashing and other adjacent construction.

C.5 Sealant Installation

Install backer rod and joint sealant according to manufacturer’s recommendations and ASTM C 1193.

C.6 On-site Testing

Perform air infiltration and water resistance testing for windows according to AAMA 502. Replace or repair defective windows and door at no additional cost to the department.

D Measurement

The department will measure Replace Operator House Windows and Door 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. 0060.05	Replace Operator House Windows and Door	EACH

Payment is full compensation for furnishing and installing new operator house windows and door including all materials, labor, tools, equipment, and incidentals necessary to complete the work. The removal of the existing windows and door are also included in this payment.

32. Remove and Replace Membrane Roof, Item SPV.0060.06.

A Description

This special provision describes all, material, equipment, and related services necessary to remove the existing operator house roof and install a new EPDM roof system, associated roofing system components, and roof-related construction as required to receive the manufacturer warranty as specified herein and on the plans.

B Materials

B.1 Insulation

Polyisocyanurate: Complying with ASTM C1289-13e1, Type II, Class 1, Grade 2; rigid board insulation with felt or fibrous mat facing on both sides. For adhered boards, maximum size of 48”x48”. For mechanically attached boards maximum size of 48”x96”. Tapered thickness as required to achieve slopes shown on plans.

B.2 EPDM Membrane

Non-reinforced white 60 mil EPDM (Ethylene Propylene Diene Monomer) elastomer single-ply rubber roof. Uncured and cured flashing shall comply with ASTM D4637, Type I, with perimeter securement strips meeting ASTM D4637, Type II.

Approved EPDM Membrane manufacturers include:

Carlisle SynTec Systems

Firestone Building Products

Johns Manville

Versico Roofing Systems.

B.3 Coverboard

Minimum ¼" Glass Fiber Reinforced Concrete (GFRC) coverboard, approved and supplied by the membrane supplier.

B.4 Roofing Accessories

Plumbing Vent Flashing: Pre-molded boot with stainless steel draw-band clamp, approved and supplied by the membrane supplier.

Drip Edge and Cleat: Aluminum drip edge with Kynar finish and cleat approved and supplied by the membrane manufacturer.

B.5 Adhesive

Bonding adhesives, cements, tapes, sealants, and accessories: foam and solvent-based adhesives and related prepping and cleaning agents required for the installation of a fully-adhered system membrane, seams, membrane flashing, membrane to insulation, insulation to insulation and deck, approved and supplied by the approved membrane provider.

Water-based adhesives are not acceptable.

B.6 Fasteners

Fasteners shall be approved and supplied by the membrane provider.

For fastening perimeter securement strip: polymer-coated screw and plate as recommended and supplied by the membrane supplier.

For fastening the premanufactured aluminum drip edge and cleat as recommended and supplied by the membrane supplier.

B.7 Sealant

Shall be ASTM C920, Type S, Grade NS, Class 25, Use NT, M, G, A, or O; FS TT-S-00230C, Type II, Class A; one-part polyurethane base, elastomeric joint sealing compound such as Sika Chemicals "Sikaflex 1a", Sonneborn-Contect "Sonolastic NP1" or Tremco "Vulkem 116", "Dynomic" or approved equal.

B.8 Cleaning Agent

Use a manufacturer-approved cleaning agent to scrub membrane sheets prior to seaming.

C Construction

C.1 Submittals

Submit product data for each specified product including manufacturer's technical data sheets and installation instructions for insulation, EPDM membrane, roofing accessories, adhesive, fasteners, sealant, and cleaning agent.

Submit manufacturer's full range of colors for sealant color selection.

C.2 Quality Assurance

Roofing contractor shall be recognized by the manufacturer of the roof system as an "approved" or "authorized" contractor applicator of their system and all associated products.

Roofing contractor shall have been in business for a minimum of three years and shall be able to document the successful completion of a minimum of three projects of similar size and/or scope of work.

Contractor shall perform a minimum of two roof system inspections during the term of the guarantee.

C.3 Warranty

Provide a five year written warranty for all roofing and flashing required under the contract, to be watertight and free from defects in materials and workmanship.

Provide manufacturer's standard 20 year non-prorated guarantee against material defects and wind damage.

The contractor is responsible for providing copies of the standard warranties and registering all materials and products with the manufacturer.

C.4 Execution

Roof system construction shall be in compliance with the NRCA – Roofing and Waterproofing Manual.

Required rating for zone 1 (field) shall be: U.L. 580 Class 30

Required rating for zone 2 (edges) shall be: U.L. 580 Class 60

Required rating for zone 3 (corners) shall be: U.L. 580 Class 90

The existing roof system shall be removed down to the concrete roof deck. Patch and repair existing concrete roof to ensure the surface is clean, dry, and free from sharp projections and depressions and that all surfaces and site conditions are ready to receive new materials.

All vertical surfaces to receive new flashing materials shall be thoroughly cleaned of existing adhesives, sealants, etc.

Install insulation with staggered joints a minimum of 6” in both directions. Install membrane according to the membrane supplier’s recommendations.

D Measurement

The department will measure Remove and Replace Membrane Roof 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. 0060.06	Remove and Replace Membrane Roof	EACH

Payment is full compensation for removal and disposal of existing roof, roof insulation, roof flashing and roof waterproofing. Payment includes fabricating, furnishing and installing new roof membrane, roof insulation, roof flashing, and roof waterproofing, including incidental equipment and materials for complete installation.

33. Replace Cylinder Access Platforms, Item SPV.0060.07.

A Description

This special provision describes removing and replacing the suspended access platforms below the hydraulic cylinders and mounted on the bascule piers.

B Materials

Conform to standard spec 506. Fabricate components using structural steel plate, shapes, 1 1/2-inch diameter standard pipe and A325 bolts as shown on the plans.

C Construction

Neatly remove the existing platforms while salvaging base connections, chains and sheaves. Attach new platforms to existing bases and reconnect to existing suspension and hoisting chains.

D Measurement

The department will measure Replace Cylinder Access Platforms by each individual platform replaced, acceptably 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. 0060.07	Replace Cylinder Access Platforms	EACH

Payment is full compensation for providing, fabricating, transporting, installing replacement sections; and for removing existing components.

34. Pipe Railing Base Repairs, Item SPV.0060.08.

A Description

This special provision describes removing and replacing deteriorated bottom portions of pipe railing posts along the timber fender system at the face of the bascule piers as shown on the plans and as directed by the engineer.

B Materials

Conform to standard spec 506. Fabricate replacement sections of posts using structural steel plate, shapes and 1 1/2-inch standard pipe as shown on the plans.

C Construction

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

Attach new sections to remaining existing portions as shown on the plans by welding with an AWS certified welder. Provide documentation of welder certification.

Remove any corroded metal from surrounding metal of railings 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 to the fender system utilizing new galvanized anchor bolts.

D Measurement

The department will measure Pipe Railing Base Repairs by each individual railing base repaired, acceptably 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. 0060.08	Pipe Railing Base Repairs	EACH

Payment is full compensation or providing, fabrication, transporting and installing railing post replacement sections; and for removing deteriorated existing portions of post.

35. Bumper Block, Item SPV.0060.09.

A Description

This special provision describes furnishing and installing a treated bumper block as shown on the plans and as described herein.

B Materials

Provide treated oak bumper blocks of the dimensions shown in the plans. Retention of treatment to be 0.8 lbs./cu.ft. chromated copper arsenate (CCA) according to these specifications. Treat by the full cell process. The salt preservative must meet the following composition: CrO3 = 33.0% - 50.5%, CuO = 17.0% - 22.0%, As2O5 = 30.0% -48.0%. Proportion the active ingredients in the solution within the range required for the salt itself. Comply testing with the American Wood Preserver's Association, Standard A2. The preservative must permeate the sapwood to a depth of 3.5 inches (88mm), or 90% of the sapwood thickness, whichever is greater. Plug all bored test holes tightly with treated plugs.

Utilize existing anchor bolts for connection. Clean and grease prior to installing blocks.

C Construction

Drill and counterbore bolt holes to diameter, depth and spacing to accommodate existing anchor bolts.

No splices or cuts are allowed in the bumpers. Provide a single piece of oak bumper and install at locations shown.

D Measurement

The department will measure Bumper Block by each individual bumper block, acceptably completed and in place. Any wood that is trimmed off in order to comply with the dimensions shown on the plans and with these special provisions will not be measured for payment.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0060.09	Bumper Block	EACH

Payment is full compensation for furnishing and installing bumper block; and for removing existing bumper block.

36. Street Sweeping, Item SPV.0075.01.

A Description

This special provision describes removing small dirt and dust particles from the roadway using a street sweeper periodically during the project as the engineer directs.

B (Vacant)

C Construction

Provide a self-contained mechanical or air conveyance street sweeper and dispose of the material collected.

D Measurement

The department will measure Street Sweeping by the hour that the street sweeper is on the project picking up and removing debris from the roadway.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0075.01	Street Sweeping	HRS

ner-628-060 (20171213)

37. Bridge Structural Steel, Item SPV.0085.01.

A Description

This special provision describes furnishing, fabricating, and erecting new bascule span structural steel components called for in the plans, and other miscellaneous steel designated for replacement but not included under other bid items. The work includes, but is not limited to stringers, lateral bracing, and all incidentals such as fill plates, connection material and shim packs.

Perform all work according to standard spec 506 and 514 except as modified in this special provision.

B Materials

B.1 General

Use high strength structural steel conforming to ASTM A 709, grade 50. Prior to painting, hot-dip galvanize all new structural steel.

Utilize galvanized ASTM A325 high strength bolts for fasteners.

Submit the bolt specification and test report to the engineer according to the standard specifications.

Paint all new structural steel according to Painting Epoxy System B-70-56.

B.2 Repair of Damaged Galvanized Coating

Repair any galvanized areas that are damaged during erection efforts and 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.

C Construction

C.1 General

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

Standard spec 506.3 applies to this item.

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

C.2 Field Erection of Bascule Span Steel

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 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.

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 supports in this work.

If 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 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.

Install new lateral bracing members prior to grid deck and ensure mating bascule girder tips are accurately aligned with each other prior to field drilling lateral bracing holes and bolting.

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 a sufficient number of times for the engineer to inspect its operation. 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.0085.01	Bridge Structural Steel	LB

Payment is full compensation for furnishing, fabricating, delivering, and erecting all new bridge structural steel, except for work noted below that is part of other pay items, in conformance to the plans and this special provision; for hot-dip galvanizing all new structural steel as specified; for providing temporary supports for the bascule leaves while imbalanced.

The department will pay separately for:

- Painting new structural steel under the pay item Painting Epoxy System B-70-56.
- Steel grid floor under the pay item Steel Grid Floor 5-Inch.
- Pipe railing base repairs under the pay item Pipe Railing Base Repairs.
- New cylinder access platforms under the pay item Replace Cylinder Access Platforms.

38. Steel Grid Floor 5-inch, Item SPV.0165.01.

A Description

Perform this work in according to the requirements of standard spec 515 except as modified herein or in the plans.

B Materials

Provide steel grid, trim bars, and bolt down assemblies conforming to ASTM A709 Grade 50 and have a minimum copper content of 0.2 percent. 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 7½ inches on-center with cross bars ¼ inch by 2½ inches at 3.75-inch spacing. Intersect the cross bars by supplemental bars ¼ inch by 1 inch evenly spaced between main bars. Provide and connect diagonal bars alternately at a main bar and a supplemental bar. Interconnect the main beams, cross supplemental and diagonal bars by welding according to manufacturer’s standards. Provide a grid system having a riding surface comprised of elements that are serrated.

Hot-dip galvanize the grid flooring, trim bars, and bolt down assemblies according to ASTM A123 or A153. Repair any and all galvanized areas damaged during erection efforts 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 procedures 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.

B.1 Fabrication

Fabricate the grid deck within the following tolerances:

- Overall Panel Length and Width: plus zero (+0) to minus one eighth (-1/8) inch maximum from the approved shop drawings.
- Panel Squareness: Diagonal lengths between extreme corners of a panel shall measure within one-quarter (¼) 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 plus or minus one-quarter (+1/4) inch per 10 linear feet in either direction.

- Main Bar Verticality: The main bar shall be no more than one sixteenth (1/16) inch out of vertical on the full bar height. Cross Bar Verticality: The cross bar shall be no more than one sixteenth (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 plus or minus one-sixteenth (±1/16) inch from the detailed bar spacing.
- Cross Bar Spacing: Center to center spacing of the cross bar shall be no more than plus or minus one-sixteenth inch (±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 Construction

Connect the grid flooring to the supporting structure by field bolting as shown on the plans. To facilitate the connection, weld bolt down 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.

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.

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 ±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 ±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 department, 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. 0165.01	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.

39. Sidewalk Slip Resistant Coating Repair, Item SPV.0165.02.

A Description

This special provision describes repairing localized deteriorated areas of slip resistant coating on the steel sidewalk plates. The existing slip resistant surface is SLIPNOT.

B Materials

Provide a repair coating that ensures a durable slip resistant surface.

Use a high-quality, durable anti-slip coating suitable for metal surfaces. Provide a coating that utilizes a two-part epoxy that is resistant to salt water, oil, gasoline, acids, caustics, hydraulic fluids, and solvents. Submit product data meeting the following requirements to the engineer for review:

- Minimum pull-off strength of 250 psi, as determined by a test method similar to ASTM C1583.
- Thermal compatibility with no delaminations, as confirmed by a test method similar to ASTM C884.
- Impact resistance passing requirements of ASTM D-2794 with no cracking or delamination occurring at 30 foot-pounds per square inch of impact.
- Case history including a minimum of 3 exterior applications in Wisconsin demonstrating at least 10 years of proven performance.

Provide a surface coating with a static coefficient of friction of 0.50 minimum in both dry and wet conditions.

Closely match the existing galvanized plate sidewalk color with the new coating.

C Construction

C.1 Surface Preparation

In the deteriorated areas thoroughly clean the existing metal sidewalk plate to remove all dirt, rust, oil, grease, and other contaminants. Square off repair areas by removing additional slip resistant coating to provide a neat edge for the new slip resistant coating application.

Use a commercial-grade cleaner/degreaser and flush the area with water to remove residues. Allow the surface to dry completely.

Remove any loose or flaking coating using mechanical means such as wire brushing, sanding or abrasive blasting. Ensure the surface is dry and free from any loose material prior to application.

C.2 Application of Anti-Slip Coating

Mix the slip resistant coating according to the manufacturer's instructions. Use a mechanical mixer to ensure uniform consistency.

Apply the coating at surface temperatures conforming to the manufacturer’s recommendations. Protect exterior applications from rain for at least 24 hours.

Apply the coating per manufacturer’s instructions.

D Measurement

The department will measure Sidewalk Slip Resistant Coating Repair by square foot of sidewalk repair, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV. 0165.02	Sidewalk Slip Resistant Coating Repair	SF

Payment is full compensation for cleaning, preparing, and applying the new anti-slip coating to the metal sidewalk panels.

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.

---

107 Legal Relations and Responsibility to the Public

Add subsection 107.27 effective with the November 2024 letting.

107.27 Drones or Unmanned Aircraft Systems (UAS)

107.27.1 Licensing and Compliance

(1) Obtain and possess the necessary Federal Aviation Administration (FAA) licenses and certifications to operate drones commercially (https://www.faa.gov/uas).

(2) Comply with all FAA regulations, airspace restrictions, and local laws. Operators of small drones that are less than 55 pounds for work or business must follow all requirements as listed in Title 14, Chapter 1, Subchapter F, Part 107 of the Code of Federal Regulations (14 CFR) and obtain a remote pilot certificate (https://www.faa.gov/uas/commercial_operators).

(3) Comply with Wisconsin State Statute 942.10. Limit operations to the specific approved purpose and employ reasonable precautions to avoid capturing images of the public except those that are incidental to the project.

(4) Provide copies of waivers required for specific project conditions to the engineer prior to any flight.

107.27.2 Flight Approval, Safety, and Incident Reporting

(1) Submit information in 107.27.2(2) to obtain written drone flight approval from the engineer at least 3 business days prior to operating a drone within the right-of-way. Do not operate a drone within the right-of-way unless approved by the engineer.

(2) Drone flight application for review and approval must include:

- UAS pilot information and qualifications, images of certification
- UAS drone information and FAA tail numbers
- Max/ Min allowable flight parameters (weather)
- Specifics of flight mission: capture scope
- Estimated flight duration
- Pre-flight checklist
- Site-specific parameters
- Notification protocols - Federal/Local/Agency/Owner/Responsible in Charge
- Confirmation and verification of approved operators and hardware
- Flight plan map diagram (including launch and landing location)
- FAA-Airspace flight map classification and confirmation with graphics
- UAS incident management protocol

(3) If contractor is requesting multiple types of the same flight, a simplified request can be submitted listing weekly flight plan.

(4) Safety measures must include but are not limited to:

- Regular training and updates on drone regulations are required and must be provided upon request.
- Drones must be operated in accordance with safety guidelines, including maintaining a safe distance from people, structures, vehicles, etc.
- Conduct a pre-flight safety assessment, considering weather conditions, airspace restrictions, and potential hazards.
- Emergency procedures (e.g., drone malfunction, loss of control) must be documented and followed.
- All incidents must be reported to the engineer.

(5) If the drone has an incident during flight, report the following to the engineer:

- Incident background and details.
- FAA (14 CFR 107.9) and NTSB (49 CFR 870) notification protocol.
- Contractor internal notification protocol.

107.27.3 Insurance Requirements

(1) Maintain drone liability insurance with the following limits.

1. For drones weighing 10 pounds or less, a liability policy with a minimum limit of $1,000,000.00 is required.

2. For drones weighing more than 10 pounds and less than or equal to 20 pounds, a liability policy with a minimum limit of $2,000,000.00 is required.
3. For drones weighing more than 20 pounds, notify engineer and department will determine appropriate liability policy coverage levels based on size, use, location, and other risk factors.

---

646 Pavement Markings

646.3.2.4 Black Epoxy

Replace paragraph (1) with the following effective with the November 2024 letting.

(1) Apply black epoxy in a grooved slot directly after the white marking. Apply epoxy at a wet mil thickness of 20. Apply black aggregate at or exceeding 25 pounds per gallon of epoxy. Do not apply glass beads to black epoxy.

ERRATA

204.3.1.3 Salvaging or Disposal of Materials

Replace paragraph (2) to correct link from 203.3.4 to 203.3.5 effective with the November 2024 letting.

(2) Dispose of concrete, stone, brick, and other material not designated for salvage as specified for disposing of materials under 203.3.5.

204.3.2.3 Removing Buildings

Replace paragraph (2) to correct link from 203.3.4 to 203.3.5 effective with the November 2024 letting.

(2) Buildings removed and materials resulting from building removal become the contractor's property unless the contract specifies otherwise. Dispose of unclaimed and removed material as specified for disposing of materials in 203.3.5.

335.3.2 Rubblizing

Replace paragraph (6) to correct link from 203.3.4 to 203.3.5 effective with the November 2024 letting.

(6) Remove reinforcing steel exposed at the surface by cutting below the surface and disposing of the steel as specified in 203.3.5. Do not remove unexposed reinforcing steel.

335.3.3 Compacting

Replace paragraph (2) to correct link from 203.3.4 to 203.3.5 effective with the November 2024 letting.

(2) Remove loose asphaltic patching material, joint fillers, expansion material, or other similar materials from the compacted surface. Also remove pavement or patches that have a maximum dimension greater than or equal to 6 inches that are either not well seated or projecting more than one inch. Dispose of removed material as specified in 203.3.5.

526.3.4 Construction, Backfilling, Inspection and Maintenance

Replace paragraph (3) to correct link from 203.3.4 to 203.3.5 effective with the November 2024 letting.

(3) Maintain temporary structures and approaches in place until no longer needed. Unless the engineer directs otherwise, completely remove and dispose of as specified in 203.3.5. Contractor-furnished materials remain the contractor's property upon removal.

602.3.6 Concrete Rumble Strips

Replace paragraph (5) to correct link from 203.3.4 to 203.3.5 effective with the November 2024 letting.

(5) At the end of each workday, move equipment and material out of the clear zone and sweep or vacuum the traveled way pavement and shoulder areas. Sweep away or vacuum up milling debris before opening adjacent lanes to traffic. Dispose of waste material as specified in 203.3.5; do not place on the finished shoulder surface.

604.2 Materials

Replace paragraph (1) with the following information to remove line and link for crushed aggregate effective with the November 2024 letting. The crushed aggregate gradation information for slope paving is now found in 604.2(3).

(1) Furnish materials conforming to the following:

Water	501.2
Select crushed material	312.2
Concrete	501
Reinforcement	505
Expansion joint filler	415.2.3
Asphaltic materials	455.2

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) for projects with a LET date on or before December 2024 and AASHTOWare Project Civil Rights and Labor (AWP CRL) for projects with a LET date on or after January 2025 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 or AWP CRL. 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 or AWP CRL 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, via the online AWP Knowledge Base, or by telephone. to schedule CRCS specific training. The AWP Knowledge Base is at: https://awpkb.dot.wi.gov/

(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) For firms wishing to export payroll/labor data from their computer system, have their payroll coordinator contact:

- For CRCS: Paul Ndon at paul.ndon@dot.wi.gov. Information about exporting payroll/labor data. Not every contractor's payroll system can produce 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
- For AWP CRL: Contact AWP Support at awpsupport@dot.wi.gov. Additional information can be found in the AWP Knowledge Base at https://awpkb.dot.wi.gov/Content/crl/Payrolls-PrimesAndSubs/PayrollXMLFileCreationProcess.htm

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).

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 project[1]; or
- The total amount of Federal financial assistance applied to the project, through awards or subaward, is below $500,000[2]

The contractor shall take actions and provide documentation conforming to CMM 228.5 to ensure compliance with this Buy America provision.

https://wisconsindot.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://wisconsindot.gov/Documents/formdocs/dt4567.docx

Attach a list of iron or steel and construction material exemptions and their associated costs to the certification form using the Buy America Exemption Tracking Tool, available at:

https://wisconsindot.gov/hccidocs/contracting-info/buy-america-exemption-tracking-tool.xlsx

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 assistant 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).

Proposal ID: 20250211030 **Project(s):** 4110-33-71

Federal ID(s): N/A

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	203.0260 Removing Structure Over Waterway Minimal Debris (structure) 01. B-70-0056	1.000 EACH	_____.____	_____.____
0004	213.0100 Finishing Roadway (project) 01. 4110-33-71	1.000 EACH	_____.____	_____.____
0006	502.0100 Concrete Masonry Bridges	2.000 CY	_____.____	_____.____
0008	502.3101 Expansion Device	124.000 LF	_____.____	_____.____
0010	502.3200 Protective Surface Treatment	2,103.000 SY	_____.____	_____.____
0012	502.4105 Adhesive Anchors 5/8-inch	8.000 EACH	_____.____	_____.____
0014	502.4204 Adhesive Anchors No. 4 Bar	112.000 EACH	_____.____	_____.____
0016	502.4205 Adhesive Anchors No. 5 Bar	124.000 EACH	_____.____	_____.____
0018	505.0600 Bar Steel Reinforcement HS Coated Structures	3,490.000 LB	_____.____	_____.____
0020	509.0301 Preparation Decks Type 1	652.000 SY	_____.____	_____.____
0022	509.0302 Preparation Decks Type 2	522.000 SY	_____.____	_____.____
0024	509.0505.S Cleaning Decks to Reapply Concrete Masonry Overlay	2,096.000 SY	_____.____	_____.____
0026	509.1000 Joint Repair	40.000 SY	_____.____	_____.____
0028	509.1200 Curb Repair	400.000 LF	_____.____	_____.____
0030	509.1500 Concrete Surface Repair	2.000 SF	_____.____	_____.____

Proposal ID: 20250211030 **Project(s):** 4110-33-71

Federal ID(s): N/A

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	509.2500 Concrete Masonry Overlay Decks	194.000 CY	_____.____	_____.____
0034	509.5100.S Polymer Overlay	509.000 SY	_____.____	_____.____
0036	509.9005.S Removing Concrete Masonry Deck Overlay (structure) 01. B-70-0056	2,096.000 SY	_____.____	_____.____
0038	509.9015.S Removing Polymer Overlay (structure) 01. B-70-0056	509.000 SY	_____.____	_____.____
0040	517.0601 Painting Epoxy System (structure) 01. B-70-0056	1.000 EACH	_____.____	_____.____
0042	517.0901.S Preparation and Coating of Top Flanges (structure) 01. B-70-0056	1.000 EACH	_____.____	_____.____
0044	517.1801.S Structure Repainting Recycled Abrasive (structure) 01. B-70-0056	1.000 EACH	_____.____	_____.____
0046	517.3001.S Structure Overcoating Cleaning and Priming (structure) 01. B-70-0056	1.000 EACH	_____.____	_____.____
0048	517.4501.S Negative Pressure Containment and Collection of Waste Materials (structure) 01. B-70-0056	1.000 EACH	_____.____	_____.____
0050	517.6001.S Portable Decontamination Facility	1.000 EACH	_____.____	_____.____
0052	618.0100 Maintenance and Repair of Haul Roads (project) 01. 4110-33-71	1.000 EACH	_____.____	_____.____
0054	619.1000 Mobilization	1.000 EACH	_____.____	_____.____
0056	628.1905 Mobilizations Erosion Control	2.000 EACH	_____.____	_____.____
0058	628.1910 Mobilizations Emergency Erosion Control	4.000 EACH	_____.____	_____.____

Proposal ID: 20250211030 **Project(s):** 4110-33-71

Federal ID(s): N/A

SECTION: 0001 Contract Items

Alt Set ID: **Alt Mbr ID:**

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0060	628.7015 Inlet Protection Type C	8.000 EACH	_____.____	_____.____
0062	642.5401 Field Office Type D	1.000 EACH	_____.____	_____.____
0064	643.0300 Traffic Control Drums	18,500.000 DAY	_____.____	_____.____
0066	643.0420 Traffic Control Barricades Type III	6,792.000 DAY	_____.____	_____.____
0068	643.0500 Traffic Control Flexible Tubular Marker Posts	12.000 EACH	_____.____	_____.____
0070	643.0600 Traffic Control Flexible Tubular Marker Bases	12.000 EACH	_____.____	_____.____
0072	643.0705 Traffic Control Warning Lights Type A	21,504.000 DAY	_____.____	_____.____
0074	643.0715 Traffic Control Warning Lights Type C	2,000.000 DAY	_____.____	_____.____
0076	643.0800 Traffic Control Arrow Boards	500.000 DAY	_____.____	_____.____
0078	643.0900 Traffic Control Signs	34,588.000 DAY	_____.____	_____.____
0080	643.0920 Traffic Control Covering Signs Type II	4.000 EACH	_____.____	_____.____
0082	643.1050 Traffic Control Signs PCMS	14.000 DAY	_____.____	_____.____
0084	643.3105 Temporary Marking Line Paint 4-Inch	156.000 LF	_____.____	_____.____
0086	643.3990 Temporary Marking Removable Mask Out Tape 12-Inch	25.000 LF	_____.____	_____.____
0088	643.5000 Traffic Control	1.000 EACH	_____.____	_____.____

Proposal ID: 20250211030 **Project(s):** 4110-33-71

Federal ID(s): N/A

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	644.1810 Temporary Pedestrian Barricade	510.000 LF	_____.____	_____.____
0092	646.1020 Marking Line Epoxy 4-Inch	1,350.000 LF	_____.____	_____.____
0094	646.5020 Marking Arrow Epoxy	4.000 EACH	_____.____	_____.____
0096	646.5120 Marking Word Epoxy	1.000 EACH	_____.____	_____.____
0098	646.6120 Marking Stop Line Epoxy 18-Inch	48.000 LF	_____.____	_____.____
0100	646.7120 Marking Diagonal Epoxy 12-Inch	10.000 LF	_____.____	_____.____
0102	SPV.0060 Special 01. Bridge Electrical Work	1.000 EACH	_____.____	_____.____
0104	SPV.0060 Special 02. Mechanical Work	1.000 EACH	_____.____	_____.____
0106	SPV.0060 Special 03. Replace HPU Enclosures	2.000 EACH	_____.____	_____.____
0108	SPV.0060 Special 04. Balance Bascule Bridge Leaves	1.000 EACH	_____.____	_____.____
0110	SPV.0060 Special 05. Replace Operator House Windows And Door	1.000 EACH	_____.____	_____.____
0112	SPV.0060 Special 06. Remove And Replace Membrane Roof	1.000 EACH	_____.____	_____.____
0114	SPV.0060 Special 07. Replace Cylinder Access Platforms	4.000 EACH	_____.____	_____.____
0116	SPV.0060 Special 08. Pipe Railing Base Repairs	2.000 EACH	_____.____	_____.____
0118	SPV.0060 Special 09. Bumper Block	1.000 EACH	_____.____	_____.____

Proposal ID: 20250211030 **Project(s):** 4110-33-71

Federal ID(s): N/A

SECTION: 0001 Contract Items

Alt Set ID: **Alt Mbr ID:**

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0120	SPV.0075 Special 01. Street Sweeping	10.000 HRS	_____._____	_____._____
0122	SPV.0085 Special 01. Bridge Structural Steel	38,944.000 LB	_____._____	_____._____
0124	SPV.0165 Special 01. Steel Grid Floor 5-Inch	3,606.000 SF	_____._____	_____._____
0126	SPV.0165 Special 02. Sidewalk Slip Resistant Coating Repair	20.000 SF	_____._____	_____._____
	Section: 0001		**Total:**	_____._____
			Total Bid:	**_____._____**

PLEASE ATTACH ADDENDA HERE

Wisconsin Department of Transportation

Division of Transportation Systems Development
Bureau of Project Development
4822 Madison Yards Way, 4th Floor South
Madison, WI 53705

Telephone: (608) 266-1631
Facsimile (FAX): (608) 266-8459

January 21, 2025

NOTICE TO ALL CONTRACTORS:

Proposal #30: 4110-33-71
Main Street, City of Oshkosh
Fox River Bridge B-70-0056
USH 45
Winnebago County

Letting of February 11, 2025

This is Addendum No. 01, which provides for the following:

Special Provisions:

Added Special Provisions	
Article No.	Description
40	Pre-Bid Site Access

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

Sincerely,

Mike Coleman
Proposal Development Specialist
Proposal Management Section

ADDENDUM NO. 01

4110-33-71

January 21, 2025

Special Provisions

40. Pre-Bid Site Access.

There will be two opportunities for potential bidders to access the inside of the bascule bridge pre-bid. The dates and times are as follows:

- Thursday, January 23, 2025; 8:00 am – 9:00 am.
- Tuesday, January 28, 2025; 8:00 am – 9:00 am.

END OF ADDENDUM