

ADDENDUM #2 GREAT SAUK STATE/WALKING IRON TRAIL – BRIDGE & TRAIL IMPROVEMENTS PROJECT SPONSORS: VILLAGE OF SAUK CITY, DANE COUNTY (in partnership with SAUK COUNTY) WIS DOT 5852-00-75 & 5666-00-78 MSA PROJECT 19234007 OCTOBER 25, 2024

Page 1 of 3

NOTICE

This Addendum is issued to modify, explain or correct the original drawings, specifications and/or previous addendums and is hereby made a part of the Contract Documents. Please attach this Addendum to the specifications in your possession and note receipt of this Addendum on page 00 41 00-2 of the bid. The bid date remains unchanged.

PROJECT MANUAL

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

ADD the following documents marked "Addendum #2":

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•	Notice to Proceed	00 55 00-1
•	Performance Bond	00 61 13.13-1 - 4
•	Payment Bond	00 61 13.16-1 - 4
•	Application for Payment	00 62 76-1 - 6
•	Field Order	00 63 36-1
•	Work Change Directive	00 63 49-1
•	Change Order	00 63 63-1
•	Certificate of Substantial Completion	00 65 16-1

For Contract 1: Section 00 73 00 Supplementary Conditions, Article 7 – Contractor's Responsibilities

ADD SC 7.18

"Delete Paragraphs 7.18A and 7.18B in their entirety and insert the following in their place:

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Village of Sauk City, Sauk County, Dane County and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Village of Sauk City, Sauk County, Dane County, or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under

Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts"

DIVISION 01 – GENERAL REQUIREMETS

Section 01 32 16 - Construction Progress Schedule

- REPLACE paragraphs 1.03A and 1.03B in their entirety and insert the following in their place:
- "A. Submit preliminary Construction Progress Schedule in accordance with General Conditions within 2 weeks of notice of award and prior to pre-construction conference.
- B. The Contractor shall comply with, and the Work shall be completed in accordance with the following construction schedule:
 - 1. Award of Contract 1 (November 26, 2024)
 - 2. Notice of Award for Contract 1 (November 27, 2024– Tentative)
 - 3. Notice to Proceed for Contract 1 (December 15, 2024 (or sooner) Tentative)
 - 4. Award of Contract 2 (December 19, 2024)
 - 5. Notice of Award for Contract 2 (December 23, 2024– Tentative)
 - 6. Notice to Proceed for Contract 2 (January 15, 2025 (or sooner) Tentative)
 - 7. No in-stream disturbance from April 20th to July 31st. No tree cutting from April 1st to October 31st; no brush clearing from May 25th to August 5th.
 - 8. Substantial Completion shall be completed by April 24, 2026 and shall include all work excluding final turf restoration and project closeout.
 - 9. Final Completion. The project shall be completed by May 18, 2026. Final Completion shall include all work as shown on the Contract Drawings and detailed in these specifications and all items addressed in final project closeout punchlist.
 - 10. Within 30 days of final completion, submit final project closeout documentation inclusive of lien waivers, affidavit of compliance with prevailing wage rate determination, and final pay request."

Section 01 35 00 - Special Provisions – WisDOT Format

REPLACE Section 01 35 00 in its entirety with attached marked "Addendum 2".

Overview of edits within this section:

- Added Section 01 35 00 Heading and Footer to pages
- Prefabricated Steel Truss Bridge Fabricate, Item SPV.0060.01
 - B.1 Approved Manufacturers clarification on approved manufacturers
 - B.2.2 Mid-Span Lookout Platform Requirements platform grates to be weathering steel
 - o B.2.5 Expansion Cover Plate Requirements Weathering steel cover plates are an acceptable alternative for Bridge B-13-0937 only.
- Jump Deterrent System (Horizontal), Item SPV.0060.05.
 - B.1.1.2 Weathering Steel Support Members horizontal support members to be weathering steel. There is no specified Basis of Design Product or pre-approved product for the horizontal support members.
- East Access Road, Item SPV.0060.10, East Water Access, Item SPV.0060.11, West Access Road, Item SPV.0060.12, West Water Access, Item SPV.0060.13
 - East Access Road and East Water Access shall be constructed as part of the project. Note means and methods flexibility for East Water Access.
 - West Access Road and West Water Access shall be constructed at the discretion of the contractor. Note means and methods flexibility for West Water Access.

DRAWINGS

ADD "General Notes:

- 1) Class I, Type B erosion mats shall be used in all areas. An urban mat shall be used in all locations.
- 2) See project specifications for specified seeding types and reference Wisconsin DOT Standard Specifications Spec Section 630 for all seeding blend specifications and application rates"

to the following sheets:

SHEET 5 – Erosion Control & Clearing SHEET 6 – Erosion Control & Clearing

REPLACE the following sheets with attached, marked "Addendum No. 2":

SHEET 11 – Gateway Sign Detail SHEET 15 – General Notes & Typical Sections SHEET 20 – Plan & Profile Walking Iron Trail SHEET 21 – Plan & Profile Walking Iron Trail SHEET 123 – Cross Sections Walking Iron Trail SHEET 124 – Cross Sections Walking Iron Trail SHEET 125 – Cross Sections Walking Iron Trail SHEET 126 – Cross Sections Walking Iron Trail SHEET 127 – Cross Sections Walking Iron Trail SHEET 128 – Cross Sections Walking Iron Trail SHEET 128 – Cross Sections Walking Iron Trail SHEET 128 – Cross Sections Walking Iron Trail SHEET 129 – Cross Sections Walking Iron Trail

General Information Only:

- Mandatory Pre-Bid Meeting for Prime Contractors is scheduled for October 28, 2024 at 1 P.M. at the Sauk Prairie Area Chamber of Commerce, 109 Phillips Blvd, Sauk City, WI 53583.
- We anticipate 45-60 mins of project overview and Q&A. Attendance at project overview session is mandatory.
- Following the overview, interested parties will proceed to the project site(s) East and West sides of the project. The group will start at the East side of the project.
- Access to the East side of project will require a hike through the woods along the proposed access route. Proper footwear and attire is encouraged.

END OF ADDENDUM



NOTICE TO PROCEED

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Effective Date of Contract:	

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement: [Select one of the following two alternatives, insert dates or number of days, and delete the other alternative.]

The date by which Substantial Completion must be achieved is **[date for Substantial Completion, from Agreement]**, and the date by which readiness for final payment must be achieved is **[date for readiness, from Agreement]**.

[or]

The number of days to achieve Substantial Completion is **[number of days, from Agreement]** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **[date, calculated from commencement date above]**; and the number of days to achieve readiness for final payment is **[number of days, from Agreement]** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **[date, calculated from commencement date above]**.

Before starting any Work at the Site, Contractor must comply with the following:

[Note any access limitations, security procedures, or other restrictions]

Owner:	[Full formal name of Owner]
By (signature):	
Name (printed):	
Title:	
Date Issued:	
Copy: Engineer	

PERFORMANCE BOND

CONTRACT Name:	OR (<i>Name and Address</i>): [Contractor]	SURETY (<i>Name al</i> Name:	nd Address of Prin	cipal Place of Business):
Address:	[Contractor's Address] [Contractor's City], [Contractor's State] [Contractor's Zip]	Address:		
OWNER (N	ame and Address):	Contract		
Name:	[Owner]	Description (Name	and Location):	[Project Name]
Mailing				
Addrosev	[Owner's Address]	[Owner] [Owner!	c Statal	
Audress.	[Owner's Address]		s State]	
	[Owner's Zip]	Contract Price: \$		[Bid Amount]
		Effective Date of t	he Agreement	
BOND				
Bond Amou	Int : [Bid Amount]			
Date of Bor	nd DATE			
	(Date of bond cannot be earlier than Efi	fective Date of the A	l <i>greement</i>):	
Modification	ns to this Bond Form			
	one See Paragraph 16			
Surety and	Contractor intending to be legally bound be	where the subject to the	terms set forth be	how do each cause this
Dorformance	contractor, interfaining to be legally bound her	officer agent or r	cernis sec iorun de	elow, do each cause this
CONTRAC				
CUNTRAC	TUR AS PRINCIPAL	SUREIT		
	(Full formal name of Contractor)	(full	formal name of S	urety) (Corporate Seal)
Bv:		Bv:		
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Name:		Name:		
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Notes: (1) Pro	ovide supplemental execution by any additional parties.	such as joint venturers. (2	2) Any singular referer	nce to Contractor, Surety,
Owner, or oth	her party shall be considered plural where applicable.	,	, , , ,	, , ,

- 1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
- 2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
- 3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
 - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
- 4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
- 5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
 - 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 - 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
- 6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the

payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

- 7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
- 8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
- 9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
- 10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
- 11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.
- 12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
- 13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

- 14.1. Balance of the Contract Price—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
- 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
- 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

- 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
- 15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
- 16. Modifications to this Bond are as follows: [Describe modification or enter "None"]

PAYMENT BOND

CONTRACTOR	(Name and Address):	SURETY (Name and	d Address of Prir	ncipal Place of Business):
Name:	[Contractor]	Name:		
Address:	[Contractor's Address]	Address:		
	[Contractor's City], [Contractor's State]			
	[Contractor's Zip]			
OWNER (Name	e and Address):	Contract		
Name:	[Owner]	Description (Name	and Location):	[Project Name]
Mailing				
Address:	[Owner's Address]	[Owner], [Owner's	State]	
	[Owner's City], [Owner's State]			
	[Owner's Zip]	Contract Price: \$		[Bid Amount]
		Effective Date of th	e Aareement	
BOND				
Bond Amount	: [Bid Amount]			
Date of Bond	DATE			
	(Date of bond cannot be earlier than Effe	ective Date of the Ag	preement):	
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Modifications t	to this <u>Bo</u> nd Form			
· None	See Paragraph 16			
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- 1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
- 2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
- 3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
- 4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
- 5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct contract with the Contractor
 - 15..1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 15..2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
- 6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
- 7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
- 8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
- 9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the

Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

- 10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
- 11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
- 12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
- 13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
- 14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
- 15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
- 16. Definitions
 - 16.1. *Claim*—A written statement by the Claimant including at a minimum:
 - 116..1. The name of the Claimant;
 - 116..2. The name of the person for whom the labor was done, or materials or equipment furnished;
 - 116..3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 - 116..4. A brief description of the labor, materials, or equipment furnished;
 - 116..5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 - 116..6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 - 116..7. The total amount of previous payments received by the Claimant; and
 - 116..8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

- 16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Construction to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
- 17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
- 18. Modifications to this Bond are as follows: [Describe modification or enter "None"]

Contractor's Application for Payment						
Owner: Owner's Project No.:						
Engineer: Engineer's Project No.:						
Contractor:	Contractor's Project No.:					
Project:						
Contract:						
Application No.: Applica	ition Date:					
Application Period: From	to					
1. Original Contract Price	\$ -					
2. Net change by Change Orders	\$ -					
3. Current Contract Price (Line 1 + Line 2)	<u>\$</u>					
4. Total Work completed and materials stored t	o date					
(Sum of Column G Lump Sum Total and Colur	nn J Unit Price Total) <u>Ş</u> -					
5. Retainage	empleted Ć					
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6 Amount eligible to date (Line 4 - Line 5 c)	\$ -					
7. Less previous payments (Line 6 from prior ap	plication)					
8. Amount due this application	\$ -					
9. Balance to finish, including retainage (Line 3 -	- Line 4)					
Contractor's Certification						
 (1) All previous progress payments received from Owner on applied on account to discharge Contractor's legitimate oblig prior Applications for Payment; (2) Title to all Work, materials and equipment incorporated Application for Payment, will pass to Owner at time of paymencumbrances (except such as are covered by a bond accept liens, security interest, or encumbrances); and (3) All the Work covered by this Application for Payment is in defective. 	account of Work done under the Contract have been gations incurred in connection with the Work covered by in said Work, or otherwise listed in or covered by this ent free and clear of all liens, security interests, and table to Owner indemnifying Owner against any such n accordance with the Contract Documents and is not					
Contractor:						
Signature:	Date:					
Recommended by Engineer	Approved by Owner					
Ву:	Ву:					
Title:	Title:					
Date:	Date:					
Approved by Funding Agency						
Ву:	Ву:					
Title:	Title:					
Date: Date:						

EJCDC C-620 Contractor's Application for Payment

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Progress Estima	ite - Lump Sum Work					Cont	ractor's Applicat	tion for Payment
Owner: Engineer: Contractor: Project: Contract:					Owner's Project No.: Engineer's Project No.: Contractor's Project No.:			
Application No.:	Application Period:	From		to			Application Date:	:
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Progress Estima	te - Lump Sum Work					Cont	ractor's Applica	tion for Payment
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Progress	Estimate - Unit Price Work								Contractor's Ap	plication	for Payment
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Contract:											
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Bid Item	Description	Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)	Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
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Progress	Estimate - Unit Price Work								Contractor's Ap	plication	for Payment
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Stored Materia	als Summary									Conti	ractor's Applicati	ion for Payment
Owner:									-	Owner's Project No.	:	
Engineer:									-	Engineer's Project N	o.:	
Contractor:									-	Contractor's Project	No.:	
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Application No.:				Application Period:	From		to		-		Application Date:	
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Item No. (Lump Sum Tab) or Bid Item No. (Unit Price Tab)	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Description of Materials or Equipment Stored	Storage Location	Application No. When Materials Placed in Storage	Previous Amount Stored (\$)	Amount Stored this Period (\$)	Amount Stored to Date (G+H) (\$)	Amount Previously Incorporated in the Work (\$)	Amount Incorporated in the Work this Period (\$)	Total Amount Incorporated in the Work (J+K) (\$)	Materials Remaining in Storage (I-L) (\$)
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FIELD ORDER NO.: [Number of Field Order]

Owner: Engineer: Contractor: Project: Contract Name: Date Issued: Owner's Project No.: Engineer's Project No.: Contractor's Project No.:

Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By:	
Title:	
Date:	

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WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Work Change Directive:

Contractor is directed to proceed promptly with the following change(s):

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User-Check one or both of the following

□ Non-agreement on pricing of proposed change. □ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price:	\$ [increase] [decrease] [not yet estimated].

Contract Time: days

[increase] [decrease] [not yet estimated].

Basis of estimated change in Contract Price:

 \Box Lump Sum \Box Unit Price \Box Cost of the Work \Box Other

	Recommended by Engineer	Authorized by Owner
By:		
Title:		
Date:		

CHANGE ORDER NO.: [Number of Change Order]

Owner: Engineer: Contractor: Project: Contract Name: Date Issued: Owner's Project No.: Engineer's Project No.: Contractor's Project No.:

Effective Date of Change Order:

The Contract is modified as follows upon execution of this Change Order:

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Times [State Contract Times as either a specific date or a

Change in Contract Price	number of days]
Original Contract Price:	Original Contract Times:
	Substantial Completion:
\$	Ready for final payment:
[Increase] [Decrease] from previously approved Change	[Increase] [Decrease] from previously approved
Orders No. 1 to No. [Number of previous Change	Change Orders No.1 to No. [Number of previous
Order]:	Change Order]:
	Substantial Completion:
\$	Ready for final payment:
Contract Price prior to this Change Order:	Contract Times prior to this Change Order:
	Substantial Completion:
\$	Ready for final payment:
[Increase] [Decrease] this Change Order:	[Increase] [Decrease] this Change Order:
	Substantial Completion:
\$	Ready for final payment:
Contract Price incorporating this Change Order:	Contract Times with all approved Change Orders:
	Substantial Completion:
\$	Ready for final payment:

	Recommended by Engineer (if required)	Accepted by Contractor
By:		
Title:		
Date:		
	Authorized by Owner	Approved by Funding Agency (if applicable)
By:		
Title:		
Date:		

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CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:
Engineer:
Contractor:
Project:
Contract Name:

Owner's Project No.: Engineer's Project No.: Contractor's Project No.:

This
Preliminary
Final Certificate of Substantial Completion applies to:

 \Box All Work \Box The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: [Enter date, as determined by Engineer]

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be allinclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: \Box None \Box As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: \Box None \Box As follows:

[List amendments to Contractor's Responsibilities]

The following documents are attached to and made a part of this Certificate:

[List attachments such as punch list; other documents]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By (signature):	
Name (printed):	
Title:	

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STSP'S Revised January 5, 2024

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract in accordance with the construction documents 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.

Measurement and payment of all bid items shall be in accordance with the units and pay measures as detailed in the basis of bid form as found in the project manual for this project.

The plans, special provisions and the schedule of pieces are developed in the US standard measure system. The Owner will pay for the work as bid in the US standard system.

In the case of a discrepancy between the Standard General conditions and the Standard Specifications for Highway and Structure Construction, the Standard General Conditions shall govern. In the case of a discrepancy between the Supplementary Conditions and the Standard Specifications for Highway and Structure Construction, the Supplementary Conditions shall govern. In the case of a discrepancy between the Standard Conditions, the Supplementary Conditions, the Standard Specification for Highway and Structure Construction, and these Special Provisions, the Standard Specification for Highway and Structure Construction, and these Special Provisions, the Special Provisions shall govern. If the Contractor thinks the responsibility for an action under the contract is unclear or is given to the wrong party, the Contractor should seek clarification from the owner.

For the purposes of this project, the Engineer will be the authorized representative of the Owner (Dane and Sauk County).

2. Scope of Work.

The work under this contract shall consist of Construction of a new multi-modal, prefabricated steel truss bridge (with safety mesh features), decorative gateway features, rehabilitation of an existing rail bridge structure to accommodate multi-modal use, and connecting trail and construction access work. These work items will include but not be limited to: removals, excavation for structures, concrete masonry bridges, prefabricated steel truss pedestrian bridge, bridge rehabilitation, timber bridge construction, Cast-In-Place (Pipe Pile), drilled shaft, backfill structure type A, excavation common, base aggregate dense, asphaltic overlay, steel and timber rail, asphaltic surface, concrete trail, concrete curb & gutter, structure lighting, clearing and grubbing, erosion control, restoration, signing, pavement marking, and all incidental items necessary to complete the work as shown on the plans and included in the project manual and contract.

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

To revise the start date, submit a written request to the engineer at least two weeks before the intended start date. The Engineer will approve or deny that request based on the conditions cited in the request.

No portion of the wetland may be disturbed beyond the area designated in the plans and the permit WDNR-GP1-2023. Vegetation, material or equipment shall not be stored in wetlands. The project will be constructed in a manner that will maintain wetland hydrology in the remaining wetland complex as applicable.

To address unusual or severe storm events, an undistributed amount of erosion control items and emergency erosion control items will be considered inclusive to the pay item.

Fish Spawning

There shall be no instream disturbance of Wisconsin River as a result of construction activity under or for this contract, from April 20th to July 31st both dates inclusive, in order to avoid adverse impacts upon the spawning of several fish species.

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

Migratory Birds

No evidence of swallow or other migratory bird nests have been observed on or under the following structures(s) during the preconstruction inspection. However, if nesting is later observed prior to or during

construction, 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.

Northern Long-eared Bat (Myotis septentrionalis)

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

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

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

To avoid adverse impacts upon the NLEBs, no tree clearing is allowed between April 1 and October 31, both dates inclusive. If the required tree clearing is not completed by March 31, the owner will suspend all tree clearing and associated work directly impacted by clearing.

Tree clearing is limited to that which is specified in the plans. Contractor means and methods to remove additional trees will not be allowed. If it is determined that additional 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.

Environmental Protection, Blanding's Turtles and Smooth Softshell Turtles

Blanding's turtles, a state special concern species and a federal species of concern, and Smooth Softshell turtles, a state special concern species, are known to inhabit the project corridor. It is reasonable to assume that turtles may be present at or near the project site during construction. If project construction starts in the spring, protect the perimeter of the areas to be disturbed with properly trenchedin silt fence before March 4 to discourage turtles from entering the work area. If the construction area cannot be silt-fenced by March 4, install the silt fence before construction activities. Also, survey the area behind the silt fence and remove all turtles confined within the project area before any site disturbance. Complete the survey and removal of turtles from construction areas periodically throughout the construction period.

Contain Debris from Bridge Construction

Contain debris and removals associated with the bridge construction at B-13-937 and B-56-258 to ensure debris does not enter the wetland areas or floodplain associated with the Wisconsin River.

Amphibian and Reptile Protection (Exclusion Fencing)

To avoid impacts to sensitive species in the area, exclusion fencing (silt fence) will be installed along the project at locations shown in the plans. The silt fence must be installed at grading areas between October 16th and April 15th in upland areas and between November 16th and March 4th in wetland/water body areas. Work can then be conducted within the fenced area at any time of year as long as the fencing is maintained.

If avoidance dates and fencing cannot be implemented, it is recommended to walk through or gently disturb the project area immediately prior to disturbance. While this will not protect nests, it may allow

turtles to move out of the area and avoid take. If a turtle is found, please carefully move it to suitable habitat outside the project area.

Remove the fence after construction is completed. If turtles are discovered during construction, carefully move turtles found with the project area to an area of suitable habitat outside of the work area. all labor and materials for this item will be paid for under the Erosion Control SPV.

4. Notice to Contractor – Eastern Massasauga Snake.

Due to the historical nature of the massasauga, both USFWS and WisDNR consider this population likely extirpated, but appropriate negative surveys have not been done to verify this, to date. If a massasauga is seen, the contractor is to stop work immediately and contact Stacy Rowe at the WisDNR Janesville Service Center.

5. Notice to Contractor – Creosote Lumber.

The Wisconsin Department of Natural Resources requires proper disposal of the creosote timbers that will result from the removal of railroad ties on structure B428E and the structure remnant crossing the Wisconsin River. Proper disposal includes, but is not limited to, land filling or use as landscape timbers. Under no circumstances should this material be burned or buried on site. Beneficial re-use of this material is an option, and the contractor may contact Benjamin Kuznicki at the WisDNR Fitchburg Service Center - Fitchburg Region Headquarters for additional information on disposal options.

Disposal shall be incidental to adjacent work.

6. Utilities.

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

There are Utility facilities located within the project limits, but no utility relocations are planned for this project.

stp-107-066 (20080501)

7. 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 prior to discharge. Prior to starting dewatering operations, submit the proposed means and methods of dewatering for each required location for approval as part of the contractor obtained WDNR permit. Include details of how the intake will be managed to not cause an increase in the background level turbidity prior to treatment and any additional measures necessary to prevent sediments from reaching the project limits or wetlands and waterways. Prior to beginning dewatering operations, obtain approval from the engineer for the proposed method of treatment.

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. This document can be found at the WisDNR website:

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

Work includes furnishing all materials and equipment, excavation, maintenance, cleaning, disposal of surplus material and removal of the dewatering system and is incidental to contract work.

8. Erosion Control.

Supplement standard spec 107.20 as follows:

Perform construction operations in a timely and diligent manner, continuing all construction operations methodically from the initial topsoil stripping operation through the subsequent grading and finishing to minimize the period of exposure to erosion.

Replace topsoil on disturbed areas, including spot locations such as cross drains, driveways, guardrail and terminals, and intersections, immediately after grading is completed within those areas. Complete

finishing operations, which includes seed, fertilizer, erosion mat, mulch, and any other permanent erosion control measures required, within seven (7) calendar days after the placement of topsoil.

A General

This This special provision describes providing erosion controls and best management practices for the project as the plans show.

B Materials

<u>Erosion Mat Stabilization</u>. The Contractor shall install biodegradable erosion matting as directed by the Field Engineer. Owner and Engineer reserve the right to field-adjust quantities as necessary. Erosion mat installation shall be as specified below:

- Class I, Type B erosion mats shall be used in all areas. An urban mat shall be used in all locations.
- Netting for the matting shall be photodegradable and/or biodegradable.
- The weight of the netting shall not exceed 15% of the total blanket weight.
- Anchoring devices shall be completely biodegradable as determined by ASTM D 5338-92. Steel wire pins or staples are not acceptable.
- The anchoring devices shall be shaped, using barbs, twists, bend, or other methods to provide additional mechanical pull resistance when installed in soil. Anchoring devices shall maintain their mechanical anchoring ability for at least 2 months, and substantially degrade within 4 months of warm soil conditions (above 53 degrees Fahrenheit).

<u>Turbidity Barrier</u>. A turbidity barrier shall be installed around the perimeter of the work area shown on the plan to encase the shoreline protection area and launches. The type and installation of the turbidity barrier shall follow the requirements of the most current Wisconsin DNR Technical Standards.

<u>Product Acceptability</u>. Only products listed in "WDOT Erosion Control Product Acceptability Lists," Current Edition, shall be used for the project.

All erosion control shall be set prior to any disturbance of the site.

C Construction

The Contractor shall install erosion control measures to prevent siltation of culvert pipes, adjacent property, and the nearby waterways. Cleaning and/or sediment removal from storm sewers, ditches, private property, or the drainage ways due to erosion from the construction site shall be the responsibility of the Contractor at no expense to the Owner. Additional measures shall be installed as necessary to prevent siltation of the culverts, private properties, and the nearby waterways. Contractor shall be responsible for the completion of WisDNR required erosion control inspections and reports. Erosion control measures shall be required per the "State of Wisconsin Department of Natural Resources Storm Water Management Technical Standards" and/or directed by the Engineer in the field. Copies of some of the standards are included in the appendices. All technical standards can be found at:

https://dnr.wisconsin.gov/topic/Stormwater/standards

D Measurement

All costs associate with furnishing, installing, maintaining, and removing erosion control measures as required on the contract drawings or Wisconsin Department of Natural Resources Construction Site Erosion and Sediment Control Technical Standards, and as required by the Field Engineer and applicable standards shall be included in the lump sum price bid for "Site Erosion Control".

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.03	Site Erosion Control	Lump Sum

9. Construction Over or Adjacent to Navigable Waters.
The Wisconsin River is classified as a federal navigable waterway under standard spec 107.19. stp-107-060 (20171130)

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

The Owner has obtained an individual Section 404 Permit from the U.S. Army Corps of Engineers. Comply with the requirements of the permit in addition to requirements of the special provisions.

A copy of the permit is attached herein.

If the contractor requires work outside the proposed slope intercepts, based on their method of operation to construct the project, it is the contractor's responsibility to determine whether a U.S. Army Corps of Engineers Section 404 permit modification is required. If a Section 404 permit modification is necessary, obtain the permit modification prior to beginning construction operations requiring the permit. No time extensions as discussed in standard spec 108.10 will be granted for the time required to apply for and obtain the permit modification. The contractor must be aware that the U.S. Army Corps of Engineers may not grant the permit modification request.

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

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

11. Information to Bidders, Permitting.

If the contractor requires work in any federal, state, or local permitted areas, based on their method of operation to construct the project, it is the contractor's responsibility to determine whether a permit modification is required. If a permit modification is necessary, obtain the permit modification prior to beginning construction operations requiring the permit. No time extensions as will be granted for the time required to apply for and obtain the permit modification. The contractor must be aware that the permitting agency may not grant the permit modification request.

12. Traffic.

A General

Water Street, within the project limits, may close to through traffic during abutment demo, abutment construction riprap placement and bridge placement operations. Detour signing is part of the project. At all other times one lane of traffic shall remain open for the duration of construction activities, flagging will be required during one lane closures at all times. Maintain two lanes of traffic at the end of each work day outside of the road closure periods. Road closures shall be coordinated with the village of Sauk City, Engineer, United States Postal Service and the adjacent businesses 30 days in advance.

Employ such flag persons, signs, barricades, and drums as may be necessary to safeguard or protect hazards in the work zone, such as exposed manholes, trenches or drop-offs for vehicles, and direct traffic at locations where construction operations may interfere or restrict the smooth flow of traffic.

Provide the engineer with 24-hour emergency contact information. Adjustments to traffic control deemed necessary by the Engineer must be completed within 24 hours of notification by the Engineer.

Submit to Engineer for approval a detailed traffic control plan for any changes to the proposed traffic control detail as shown on the plans.

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

B Traffic Control Devices

Place roadway signing as detailed on the plans and in conformance with the Manual of Uniform Traffic Control Devices (MUTCD), latest edition. Place traffic control complete by the end of the working day of a traffic staging switch.

Do not switch traffic over to the next construction stage until all signing, pavement marking, and traffic control drums for the stage are in place, and conflicting pavement markings and signs are removed as shown in the traffic control section of the plans and as directed by the engineer. Allowable exceptions to this specification are intersection areas where traffic control cannot be placed until the switch is made.

C Access

Maintain local vehicle traffic access to properties within the work zone that do not have alternate access available outside of the work zone at all times. Do not restrict or close access to a property without notifying the property owner, resident, or business a minimum of 30 days in advance.

Maintain ramped driveway access on existing driveway surface, compacted base aggregate dense, or finished driveway surface. Maintain truck access to businesses that receive truck deliveries for the duration of the project construction.

Vehicle access to a property driveway may be closed for a maximum of 24 hours in total for excavation to roadway subgrade.

Construct driveway approaches to commercial properties in stages if the property does not have an alternate access available so that access is maintained to each business at all times.

Maintain emergency vehicle access, as well as mail and other delivery vehicle access at all times to all properties throughout construction; except during paving and utility installation operations occurring in the immediate vicinity of the property. When access must be limited due to construction operations, notify the police and fire departments, postal service, the Engineer and property owners and occupants at least 48 hours prior to the beginning of the construction operation. Complete the work in a reasonable time and manner to resume access to the property.

D Advance Notice

Notify the City of Sauk Prairie Police Department, Fire Department, and the Post Office a minimum of 30 calendar days prior to closing Water Street and prior to switching staged construction. All project traffic control shall be in place by 7:00 AM the day construction begins.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.02	Traffic Control, Complete	LUMP SUM

13. 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 STH 12 and STH 78 traffic, and entirely clear the traveled way and shoulders of such portions of the highway of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic during the following holiday and special event periods:

- From noon Friday, May 23 to 6:00 AM Tuesday, May 27 Memorial Day;
- From noon Friday, July 3 to 6:00 AM Tuesday, July 7 Independence Day;
- From noon Friday, August 28 to 6:00 AM Tuesday, September 2 Labor Day.

14. 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;
- 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 (>104° F) application.

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

stp-107-055 (20130615)

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
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	<u>≥</u> 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	<u>≤</u> 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: WisDOT #5852-00-75,78 Project #19234007

<u>Polymer Binder</u>: 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.

<u>Aggregates</u>: 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:

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

<u>Pre-Installation Meeting</u>: 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).

<u>Manufacturer's Representative</u>: 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.

<u>Material Storage</u>: 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 in accordance with 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 in accordance with 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						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 Owner will measure Polymer Overlay by the square yard, acceptably completed.

E Payment

The Owner 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 owner will pay separately for deck repairs.

stp-509-030 (20200629)

16. Waterway Buoys, Item SPV.0045.01

A Description

This special provision describes WisDNR coordination and permit preparation and application and submittal (by contractor), as well as furnishing, placing, maintaining, and removing waterway buoys, anchorages, flashing lights, and all other materials associated with this item, according to the pertinent requirements of the Wisconsin Department of Natural Resources. Contractor shall develop a water way navigation/ buoy plan based on their proposed construction operations and submit to WisDNR for review and permit issuance. Adequate public navigation shall be maintained at all times throughout the duration of the project. These requirements may be obtained on the internet at the following address:

https://dnr.wisconsin.gov/Topic/Boat/ordinances

B Materials

Furnish buoys that are cylindrical in shape with a 7-inch minimum diameter and that extend a minimum of 36 inches above the waterline. Provide buoys of colors, markings, and messages as specified in the Waterway Marker Permit, along with a flashing light adorning the buoy. Light colors shall be as shown in the plan or as specified in the Waterway Marker Permit.

C Construction

Place buoys as shown on the plan as approved by WisDNR and by the engineer. Place waterway buoys in the water prior to any in-stream work (demolition or construction) and keep them in place until such work is completed and all in-water obstructions, such as falsework, are completely removed. Locations of navigation ways may need to be adjusted from that shown in the plans based on the information provided through the River Bottom Bathymetric Survey item, local ordinances, and as directed by the engineer.

D Measurement

The Owner will measure Waterway Buoys by the unit price for the project duration of the project that the contractor is performing in-stream or overhead work. Acceptance of the waterway buoys and their placement shall be at the discretion of the engineer.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0055.01	Waterway Buoy	Dollar

17. Prefabricated Steel Truss Bridge Fabricate, Item SPV.0060.01

A Description

This special provision describes providing a fully engineered, fabricated steel truss pedestrian bridge structure, including railings, bearings, mid-span lookout platforms, lighting access points, cover plates and all other details as the contract plans show. Conforming to standard spec part 5 as modified in this special provision. Regard these specifications as minimum standards for design and construction.

B Materials

B.1 Approved Manufacturers

WisDOT #5852-00-75,78 Project #19234007

The bridge shall be designed and manufactured by an approved designer and supplier selected from the Wisconsin Department of Transportation approved products list for prefabricated steel truss bridges. WisDOT Approved Fabricators – Steel Bridge Primary Members with approved certification #2 – "Truss with length < 200ft, almost entirely preassembled at the certified facility and shipped in no more than three subassemblies" also meet the necessary prequalification and do not require pre-approval.

To be eligible for this project, pre-fabricated bridges from other manufacturers must be pre-approved before the bid opening date. Applications for pre-approval must be submitted at least 10 business days prior to bid opening date. To ensure the proposed manufacturer will comply with these specifications, the following documentation must be included:

- Proof of AISC shop certifications
- Representative design calculations
- Representative shop drawings
- Splicing and erection procedures
- Welding process / Welder qualifications
- References and list of similar projects

The Project Engineer will evaluate and verify the accuracy of the submittal. If the Project Engineer determines that the qualifying criteria have not been met, the proposed manufacturer shall be rejected. Manufacturers other than those listed in the Wisconsin Department of Transportation approved products list may only be used if the Project Engineer provides written approval of the proposed manufacturer 5 business days prior to the bid opening date. All rulings are final.

B.2 Design Requirements

Structural design of the pedestrian bridge shall be by a professional engineer registered in the State of Wisconsin.

Design the bridge according to the most recent edition of the AASHTO LRFD Bridge Design Specifications, all current interims, and the AASHTO LRFD Guide Specifications for Design of Pedestrian Bridges, except as modified herein.

Design welded tubular connections according to the Structural Welding Code-Steel ANSI/AWS D1.1. The fracture critical requirements of ANSI/AWS D1.5 do not apply, and Charpy V-notch impact testing will not be required. Loading shall be as stated in Section 3 of the AASHTO LRFD Guide Specifications for Design of Pedestrian Bridges and include an additional 20 psf future wearing surface dead load on the entire deck surface area. The bridge shall be a Warren style through truss (with overhead portal bracing required) with a profile and a clear width/height as shown on the plans. Each span shall have an equal number of bays.

Chords, diagonals, verticals, bracing, and floor beams may be tube steel. Tube steel shall have a minimum thickness of 1/4 inch, angles shall have a minimum thickness of 1/4-inch, C-shaped side dams shall have a minimum web thickness of 3/16-inch, and W-shapes shall have a minimum web thickness of 1/4-inch if painted or coated and 5/16-inch if not painted or coated. All other steel shapes shall have a minimum thickness of 5/16 inch unless contract plans allow a minimum thickness of less than 5/16 inch for other steel shapes. Field splices shall be bolted with ASTM F3125 Grade A325 high strength bolts according to the "Specifications for Structural Joints Using High Strength Bolts". Type 3 bolts are required for weathering steel. For top and bottom chord field splices, splice plates are required on both the inside and outside surface of all four sides of the spliced tubing so that each bolt will be acting in double shear. Nuts may be welded to the splice plates to hold them in place during installation. When the collection of water inside a structural tube is a possibility, either during construction or during service, provide the tube with a drain hole at its lowest point.

If the profile grade line is on a crest vertical curve, camber the bridge to match the profile grade line the plans show plus the calculated dead load deflection. For a single span bridge, if the profile grade line has a constant slope (no vertical curve), camber the bridge to offset the calculated dead load deflection plus an amount equal to 1% of the bridge length. For a bridge with two or more spans, if the profile grade line has a constant slope (no vertical curve), camber the bridge to offset the calculated dead load deflection plus has a constant slope (no vertical curve), camber the bridge to offset the calculated dead load deflection only. Concrete bridge decks shall be continuous over the floor beams. Concrete bridge decks may be supported by stay in place corrugated steel deck forms unless the contract plans specify removable deck forms only. The maximum depth of the stay in place corrugated steel deck forms shall be 2 inches. The

steel area of the stay in place corrugated steel deck forms shall not be considered for the design of the concrete deck. Design of the stay in place corrugated steel deck forms shall be included with the truss design. The minimum slab thickness shall be 5.5 inches for removable deck forms and 6 inches for stay in place corrugated steel deck forms. For stay in place corrugated steel deck forms the 6 inch minimum is measured from the bottom of the deck form. Design the longitudinal reinforcing steel in the slab based on a wheel load located 1 foot from the face of the curb or toe plate, or a pedestrian live load of 90 psf, whichever controls.

Concrete strength (f'_c) shall be 4,000 psi and F_y of bar steel shall be 60,000 psi. A concrete mix with a unit weight of 120 pcf or 150 pcf may be used at the option of the manufacturer/contractor. Use a design dead load of 120 pcf or 150 pcf to match the concrete mix selected. Use load factors of 1.25 for dead load and 1.75 for live load for the design of the concrete slab and floor beams. Minimum concrete cover shall be 2 inches for top reinforcement and 1 inch for bottom reinforcement. Design the bridge for expansion and contraction with a temperature range of -30° F to 120° F. Utilize Teflon slip pads or other approved material on the sliding surface of the expansion bearing assembly.

B.2.1 Railing Requirements

Install tubular rail to the main vertical truss members as shown in the plans. Railing height is 4'-6" from the concrete deck to the top of the top rail. Rail on the main span truss shall utilize members including bottom rail, top rail and vertical spindles matching the railing details shown in the contract plans for railings located on the abutments. Railings shall be continuous except at field splices where the railing may end with the vertical end spindle.

Provide a maximum 3" gap between end spindles at field splice locations.

The railing members and connections shall be designed for a 200 lbs concentrated load at any point (vertically or transversely) or a 50 plf, (vertically and transferal) acting simultaneously on both the top and bottom rail members. Railings are to run the entire length of the bridge between back of truss end posts (162'-0" total length).

B.2.2 Mid-Span Lookout Platform Requirements

Design and install mid-span lookout platforms on each side near the mid-span of the truss (each span) as shown in the plans (4-ft minimum clear width and a minimum of 20-ft long). The mid-span lookout platforms shall be attached to the truss structure by either shop welding or field bolting support beams to the bottom chord of the truss.

The platform shall utilize weathering steel grating as the final walking surface. The top of steel grating shall be set 1/4-inch above finished deck concrete surface to accommodate the polymer overlay. The steel grating shall utilize weathering steel grating with no gaps larger than 3/8-inch.

Two openings in the truss railing that are 4-ft clear width and provide a minimum 6'-8" clear height shall allow access to the mid-span lookout platforms. Provide a continuous walking surface from main truss concrete deck to the mid-span lookout platform.

The platform shall be designed for a 90 psf pedestrian live load with a 1.25 dead load factor and a 1.75 live load factor on all overhang platform members. Railings on the mid-span lookout platform (4'-6" in height) shall fully enclose the lookout platform including along the truss structure except for at the two access openings to the main truss. Rail on the mid-span lookouts shall utilize members including bottom rail, top rail and vertical spindles matching the railing details shown in the contract plans for railings located on the pier lookouts. The truss rail and the platform rail shall either join or provide a gap no larger than 3-inches at the access locations. The railing members and connections shall be designed for a 200 lbs concentrated load at any point (vertically or transversely) or a 50 plf, (vertically and transversely) acting simultaneously on both the top and bottom rail members.

B.2.3 Lighting Requirements

Coordinate with the lighting contractor on final conduit access locations and light fixture mounting plate locations along the length of each bridge span. Lights are to be mounted a minimum of 15-ft apart and a maximum of 25-ft apart for each span. Spans 1 & 3 require a minimum of 8 light locations with 2 locations required on either side of the bridge at the mid-span lookout locations. Span 2 requires a minimum of 7 light locations. Lights must be spaced along alternate sides of the bridge across the bridge (as shown in the contract plans). The first and last lights of each span shall be located within the first and last bay of the truss. Provide conduit access openings in the truss vertical members and light fixture mounting plates as detailed in the contract plans. If modifications are required, note the changes within the shop drawings

and coordinate with lighting contractor. Final installation of conduits, junction boxes, wiring and light fixtures will be in the field by the lighting contractor and will be paid for separately under the Bridge Lighting bid item.

B.2.4 Jump Deterrent System Requirements

Coordinate with the Jump Deterrent System fabricator on attachment locations for jump deterrent systems to the truss along the length of each bridge span and at the mid-span lookout as detailed in contract plans. See SPV.0060.04 Jump Deterrent System (Vertical) and SPV.0060.05 Jump Deterrent System (Horizontal) specials for additional information.

Providing attachment tabs to the truss vertical members for the Jump Deterrent System (Vertical) safety mesh and attachment locations (such as bolt holes) along the truss mid-span lookouts for attachment of the Jump Deterrent System (Horizonal) safety mesh at locations coordinated with the Jump Deterrent System fabricator are to be included in the unit cost of this special provision (Prefabricated Steel Truss Bridge Fabricate).

B.2.5 Expansion Cover Plate Requirements

Checkered stainless steel cover plates shall be provided to cover the expansion gaps between the truss deck and the abutments and piers. Cover plates shall fit tight to the top of the abutments and piers without any bridge weight bearing on the abutment or pier concrete surface and shall provide a smooth transition from concrete surface to concrete surface limiting trip hazards. Cover plates shall be rigidly attached to the deck on truss side of the expansion gap with concrete anchor screws provided by the manufacturer. The cover plate thickness shall be determined from the specified design live loading. All final details of cover plate size, thickness, concrete anchor screws, and installation details shall be included in the shop drawings for review.

Weathering steel cover plates are an acceptable alternative for Bridge B-13-0937 only.

B.3 Plan Requirements and Submittals

Submit shop drawings and calculations to the Project Engineer conforming to standard spec <u>105.2</u>. Project Engineer review does not relieve the contractor from responsibility for errors or omissions on shop drawings.

Make the submittal no later than 12 weeks after date of notice of contract approval. Allow the following time period in the construction schedule: 20 calendar days after the first receipt of plans by the Project Engineer for a complete initial review of the design and plans submittal, and an additional 20 calendar days for any necessary revisions and/or corrections.

In the submittal, include the following:

- 1. Basic design criteria shown on the design plans.
- 2. Complete detailed drawings of all structural steel connections, sizes of members, span lengths between bearing points, skews, walkway widths, height of handrails and safety rails, bearing assembly details, anchor bolt locations, concrete deck reinforcement, design data, materials data, and dead and live load bearing reactions.
- 3. Engineer's certification. The plans shall be sealed, signed, and dated by a professional engineer registered in the State of Wisconsin.
- 4. One set of design calculations with independent checks.
- A completed Wisconsin Department of Transportation "Bridge Load Rating Summary" Form (v. 07-2020); sealed, signed and dated by a professional engineer registered in the State of Wisconsin.

The Project Engineer will return shop drawings from this submittal, and any subsequent submittals, to the fabricator, either indicating acceptance or marked with required revisions and/or corrections.

B.4 Weld Testing

An independent agency shall perform nondestructive weld testing; the manufacturer shall pay for this testing. All welds are to be visually inspected except as noted below.

Ten percent of all fillet welds shall be magnetic particle tested.

All full penetration welds of chords shall be ultrasonically or radiographically tested.

Bottom chord welded tube splices for tube thicknesses less than 3/8 inches thick shall be radiographically tested or covered with fillet welded splice plates with non-intersecting welds which develop 75% of the spliced member strength.

Submit electronically a written testing report upon completion.

C Construction

C.1 Delivery and Erection

The manufacturer is responsible for the safe storage of all prefabricated steel truss bridge components until final delivery to the project site. Materials stored outside, which could be adversely affected by exposure to the weather, shall be protected in order to maintain their original as-fabricated condition.

Deliver the bridge by truck to the project site. Coordinate with the bridge contractor on the recommended delivery location and time of arrival. Delivery, hauling permits and freight charges are the responsibility of the manufacturer.

The manufacturer shall notify the bridge contractor in advance of the expected arrival time. Information regarding delays after the trucks depart the plant such as inclement weather, delays in permits, rerouting by public agencies, or other circumstances shall be passed on to the bridge contractor as soon as possible.

The manufacturer shall provide an erection procedure to the bridge contractor and shall advise the contractor of the actual lifting weights, attachment points, and all other information needed to install the bridge. The procedure for bolting field splices shall be given to the bridge contractor by the manufacturer.

Unloading, splicing, bolting, and providing proper lifting equipment as well as all tools, equipment, labor, and miscellaneous items required to complete the work is the responsibility of the bridge contractor and will be paid for separately under the Prefabricated Steel Truss Bridge Install bid item.

C.2 Finishes

All steel used in prefabricated steel truss bridge shall be unpainted and self-weathering. Fabrications shall be produced from high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing, ASTM A606 sheet, and/or ASTM A588, ASTM A242, or ASTM A709 Grade 50W plate and structural steel shapes (F_y =50,000 psi) with a minimum corrosion index of 5.8 per ASTM G101.

Blast-clean all exposed surfaces of weathering steel according to Steel Structures Painting Council Surface Preparation Specifications No. 7 Brush-Off Blast Cleaning (SSPC-SP7), latest edition. Exposed surfaces of weathering steel shall be defined as those surfaces seen from the deck and from outside the structure. Stringers, floor beams, lower brace diagonals and the inside face of the truss below the deck, and bottom of the bottom chord do not need to be blasted.

D Measurement

The Project Engineer will measure Prefabricated Steel Truss Bridge Fabricate as a single unit of work for each structure bridge span, acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.01	Prefabricated Steel Truss Bridge Fabricate	EACH

Payment is full compensation for designing, manufacturing, and transporting the pedestrian bridge span; furnishing bearing plates, pads, bolts, anchors bolts, mid-span lookout platforms, lighting access holes, lighting attachment plates, cover plates, and coordination with jump deterrent system. Installing each of the prefabricated steel truss spans will be paid for separately under the Prefabricated Steel Truss Bridge Install bid item.

18. Prefabricated Steel Truss Bridge Install, Item SPV.0060.02

A Description

This special provision describes the unloading of prefabricated steel truss segments, splicing segments together, installing the fully assembled spans and final bearing installation and installing grout, and installing cover plates between truss deck and abutments/piers.

B Materials

All prefabricated truss materials shall be provided by the truss manufacturer paid for separately under the Prefabricated Steel Truss Bridge Fabricate bid item.

All other materials required for the installation of the prefabricated steel truss spans into the final plan positions as shown on the plans are by the bridge contractor. All such materials shall conform to applicable ASTM or AASHTO specifications.

C Construction

Unloading, splicing, bolting, and providing proper lifting equipment as well as all tools, equipment, labor, and miscellaneous items required to complete the work is the responsibility of the bridge contractor.

The bridge contractor shall coordinate with the truss manufacturer on the delivery location and time of arrival for each prefabricate bridge segment. The contractor shall unload the truss segments at the lifting points specified by the bridge manufacturer.

Splice truss segments together as outlined in the manufacture's procedure shall be followed for bolting field splices.

The bridge contractor shall coordinate with the lighting contractor on installation of conduits on the underside of the deck and through the truss members in the access points provided in the steel truss by the manufacturer along with pull/splice wireways and all on span wiring. The installation of the conduit, pull/splice wireways and wiring will be paid for separately under the Bridge Lighting bid item.

Lift fully assembled truss span with bridge contractor supplied equipment into final bearing locations on the bridge abutments and piers as indicated in the bridge plans and as detailed in the prefabricated steel truss bridge manufacturers' shop drawings.

Install bearings and anchor bolts (provided by manufacturer) as indicated in the erection procedure provided by the manufacturer.

Installation of the vertical and horizontal jump deterrent systems on the truss is not included in this special provision and shall be included under the bid items: Jump Deterrent System (Vertical) and Jump Deterrent System (Horizonal).

Following the placement of the concrete deck on the truss spans (concrete and reinforcing steel paid for separately), the bridge contractor shall install the checkered stainless steel cover plates between the truss deck and the abutment backwall or the pier top deck. Ensure during the concrete placement of the truss decks, abutment backwalls and pier decks that any recess in the concrete required for the cover plate installation has been provided and shall ensure a smooth transition from concrete surface to concrete surface limiting trip hazards. The hardware required for the installation of the checkered stainless steel cover plates shall be provided by the manufacturer.

D Measurement

The Project Engineer will measure Prefabricated Steel Truss Bridge Install as a single unit of work for each structure bridge span, acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.02	Prefabricated Steel Truss Bridge Install	EACH

Payment is full compensation for unloading the pedestrian bridge span; splicing the bridge span segments together, moving and lifting fully assembled bridge span into final position on the bridge abutments and piers, installing bearings and anchor bolts, grouting bearings, and installing checkered stainless steel cover plates following bridge deck pour. Concrete and reinforcing steel for the truss deck and the jump deterrent systems on the truss will be paid for separately under separate bid items.

19. Gateway Sign Feature Anchor Assemblies, Item SPV.0060.03

A Description

This special provision describes constructing anchor assemblies for the Gateway Sign Feature on the bridge structure.

B Materials

Provide anchor assembly materials per the Wisconsin Department of Transportation Standard Specifications Section 532.2.1 (3) for stainless steel.

C Construction

Construct anchor assemblies per the Wisconsin Department of Transportation Standard Specifications Section 531.3.

D Measurement

The Owner will measure Gateway Sign Feature Anchor Assemblies as each individual assembly acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.03	Gateway Sign Feature Anchor Assemblies	EACH

Payment for Gateway Sign Feature Anchor Assemblies is full compensation for providing anchor assemblies. Gateway Sign Feature structural steel, base plates and all other components will be paid for separately.

20. Jump Deterrent System (Vertical), Item SPV.0060.04.

A Description

Fabricate and install wire fabric mesh safety system in a vertical application across the steel truss vertical members on the pedestrian bridge B-56-258 truss spans as shown in the contract plans.

B Materials

B.1 General

B.1.1.1 Stainless Steel Mesh

Wire Rope Mesh: stainless steel wire mesh rope complying with ASTM A 492, Type 316. The vertical application shall meet the size requirements detailed in the contract plans. Powder coat paint the stainless steel wire mesh sepia-brown color to best match the bridge superstructure weathering steel patina color. Submit samples of the stainless steel mesh wire with coloring to the field engineer for approval before bringing final quantity of mesh to the project site.

Wire-Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to the minimum breaking strength of wire rope with which they are used.

Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

B.1.1.2 Weathering Steel Support Members

All steel used in safety mesh vertical panel frames (between truss vertical members) shall be unpainted and self-weathering. Fabrications shall be produced from high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing, ASTM A606 sheet, and/or ASTM A588, ASTM A242, or ASTM A709 Grade 50W plate and structural steel shapes (F_y =50,000 psi) with a minimum corrosion index of 5.8 per ASTM G101.

B.2 Manufacturers

Subject to compliance with the product requirements listed above, provide the Basis of Design product or engineer approved equivalent product from the available manufacturers listed below. Wire Rope Mesh

products of other manufacturers matching the aesthetics, performance, and certifications of the product requirements listed above may be used with the written approval of the engineer.

Subject to compliance with requirements, provide Wire Rope Mesh products by one of the following:

Carl Stahl GKD Metal Fabrics Banker Wire

Cambridge Architectural

B.3 Design Requirements

Safety mesh (including all supporting structure members) shall be designed to withstand a 40 psf load across the entire mesh surface. This load is to be considered an Extreme event under the AASHTO Load Combination Limit States in analysis of the bridge structure.

Coordinate with the prefabricated steel truss bridge fabricator on the attachment locations and methods for the vertical panel frames to the vertical truss members across the length of the bridge. See SPV.0060.01 Prefabricated Steel Truss Bridge Fabricate special for additional information.

B.4 Plan Requirements and Submittals

Submit shop drawings and calculations to the Project Engineer conforming to standard spec 105.2. Project Engineer review does not relieve the contractor from responsibility for errors or omissions on shop drawings.

Make the submittal no later than 12 weeks after date of notice of contract approval. Allow the following time period in the construction schedule: 20 calendar days after the first receipt of plans by the Project Engineer for a complete initial review of the design and plans submittal, and an additional 20 calendar days for any necessary revisions and or corrections.

In the submittal, include the following:

- 1. Basic design criteria shown on the design plans.
- 2. Complete detailed drawings of all structural steel connections, sizes of members, member lengths, safety mesh details, attachment details (safety mesh to structural steel vertical members), design data, and materials data.
- 3. Engineer's certification. The plans shall be sealed, signed, and dated by a professional engineer registered in the State of Wisconsin.
- 4. One set of design calculations with independent checks.

The Project Engineer will return shop drawings from this submittal, and any subsequent submittals, to the fabricator, either indicating acceptance or marked with required revisions and/or corrections.

C Construction

C.1 Fabrication

Fabricate the vertical panel frames with safety mesh across the length of the bridge truss span and to the height shown on the plans. Coordinate with the prefabricated steel truss bridge fabricator on the truss vertical member spacing, member sizes and angle of slope for fabrication of the vertical panel frames. Provide attachment hardware for vertical panel frames to the truss vertical members as shown on the bridge plans. Provide a means for tensioning the wire Safety Mesh to the minimum level specified or recommended by the manufacturer.

Provide shop drawings in accordance to the requirements of section 506.3.2 of the standard specifications. Shop drawings shall contain material sizes and types, weld sizes and locations, and all necessary details, dimensions, and information to allow fabrication of both the vertical safety mesh along the length of the truss in conformance with the requirements of the contract. Do not begin fabrication prior to shop drawing review and acceptance.

C.2 Installation

Deliver material to the project site in an undamaged condition. Upon receipt at the job site, all materials shall be thoroughly inspected to ensure that no damage occurred during shipping or handling and

conditions of materials is in conformance with these specifications. Carefully store the material off the ground to ensure proper ventilation and drainage.

No field welding, or field cutting will be permitted. Provide attachment hardware and fasteners to secure safety mesh fabric to the panel frame support members. Additionally, provide attachment hardware and fasteners to secure the panel frame support members to the bridge truss span as shown in the plans.

D Measurement

The Project Engineer will measure Jump Deterrent System (Vertical) as a single unit of work for each structure bridge span, acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.04	Jump Deterrent System (Vertical)	EACH

Payment is full compensation for fabricating, furnishing, installing the safety mesh system between the truss vertical members on each truss span and all necessary accessories; preparing shop drawings and for furnishing all labor, equipment, tools and items necessary to complete the work.

21. Jump Deterrent System (Horizontal), Item SPV.0060.05.

A Description

Fabricate and install wire fabric mesh safety system in a horizontal application at both the steel truss midspan lookouts of the pedestrian bridge B-56-258 and at the pier lookouts between spans of the pedestrian bridge B-56-258 as shown in the contract plans.

B Materials

B.1 General

B.1.1 Mesh

B.1.1.1 Stainless Steel Mesh

Wire Rope Mesh: stainless steel wire mesh rope complying with ASTM A 492, Type 316. The horizontal application shall meet the size requirements detailed in the contract plans. Powder coat paint the stainless steel wire mesh sepia-brown color to best match the bridge superstructure weathering steel patina color. Submit samples of the stainless steel mesh wire with coloring to the field engineer for approval before bringing final quantity of mesh to the project site.

Wire-Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to the minimum breaking strength of wire rope with which they are used.

Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

B.1.1.2 Weathering Steel Support Members

All steel used in safety mesh horizontal support members shall be unpainted and self-weathering (weathering steel). Fabrications shall be produced from high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing, ASTM A606 sheet, and/or ASTM A588, ASTM A242, or ASTM A709 Grade 50W plate and structural steel shapes (F_y =50,000 psi) with a minimum corrosion index of 5.8 per ASTM G101.

B.2 Manufacturers

Subject to compliance with the product requirements listed above, provide the Wire Rope Mesh Basis of Design product or engineer approved equivalent product from the available manufacturers listed below. Wire Rope Mesh products of other manufacturers matching the aesthetics, performance, and certifications of the product requirements listed above may be used with the written approval of the engineer.

Subject to compliance with requirements, provide Wire Rope Mesh products by one of the following:

Carl Stahl

GKD Metal Fabrics

Banker Wire

Cambridge Architectural

B.3 Design Requirements

Truss mid-span horizontal safety mesh support members are to be 10 ft long and are to be designed to carry a load of 40 psf on the safety mesh spanning from support beam to support beam. Additionally, the horizontal safety mesh application at the truss mid-span lookouts shall be designed to withstand an 800-lb vertical point load at any location along the mesh. These loads are to be considered Extreme events under the AASHTO Load Combination Limit States in analysis of the bridge structure. Coordinate with the prefabricated steel truss bridge fabricator on attachment locations for horizontal support members to be attached to the truss mid-span members. See SPV.0060.01 Prefabricated Steel Truss Bridge Fabricate special for additional information.

Pier lookout horizontal safety mesh support members are to be 10 ft long and are to be designed to carry a load of 40 psf on the safety mesh spanning from support beam to support beam. Additionally, the horizontal safety mesh application shall be designed to withstand an 800-lb vertical point load at any location long the mesh. Design cast-in-place embedment of the horizontal members to the side of the pier top deck concrete (no post installed anchorage applications will be allowed).

B.4 Plan Requirements and Submittals

Submit shop drawings and calculations to the Project Engineer conforming to standard spec 105.2. Project Engineer review does not relieve the contractor from responsibility for errors or omissions on shop drawings.

Make the submittal no later than 12 weeks after date of notice of contract approval. Allow the following time period in the construction schedule: 20 calendar days after the first receipt of plans by the Project Engineer for a complete initial review of the design and plans submittal, and an additional 20 calendar days for any necessary revisions and or corrections.

In the submittal, include the following:

- 1. Basic design criteria shown on the design plans.
- 2. Complete detailed drawings of all structural steel connections, sizes of members, member lengths, safety mesh details, attachment details (safety mesh system the structural steel mid-span lookout members and to the pier concrete), design data, and materials data.
- 3. Engineer's certification. The plans shall be sealed, signed, and dated by a professional engineer registered in the State of Wisconsin.
- 4. One set of design calculations with independent checks.

The Project Engineer will return shop drawings from this submittal, and any subsequent submittals, to the fabricator, either indicating acceptance or marked with required revisions and/or corrections.

C Construction

C.1 Fabrication

Fabricate the horizonal safety mesh support members along with safety mesh at each of the trusses midspan lookouts to the horizonal distance shown on the plans. Coordinate with the prefabricated steel truss bridge fabricator on the truss mid-span lookout member spacing, member sizes and dimensions for the fabrication of the horizonal safety mesh support members. Provide attachment hardware for horizonal members to the truss mid-span lookout members. Provide a means for tensioning the wire Safety Mesh to the minimum level specified or recommended by the manufacturer.

Fabricate the safety mesh support members along with safety mesh at each pier lookout to the horizonal distance shown on the plans. Fabricate along the radius of the pier lookouts as detailed in the plans. Provide means of attaching safety mesh support members to the pier top deck concrete. Only cast-in-place embedment methods will be allowed (no post installed anchorage applications will be allowed). Provide a means for tensioning the wire Safety Mesh to the minimum level specified or recommended by the manufacturer.

Provide shop drawings in accordance to the requirements of section 506.3.2 of the standard specifications. Shop drawings shall contain material sizes and types, weld sizes and locations, and all necessary details, dimensions, and information to allow fabrication of the horizonal safety mesh at the truss mid-span lookouts and the pier lookouts in conformance with the requirements of the contract. Do not begin fabrication prior to shop drawing review and acceptance.

C.2 Installation

Deliver material to the project site in an undamaged condition. Upon receipt at the job site, all materials shall be thoroughly inspected to ensure that no damage occurred during shipping or handling and conditions of materials is in conformance with these specifications. Carefully store the material off the ground to ensure proper ventilation and drainage.

No field welding, or field cutting will be permitted. Provide attachment hardware and fasteners to secure safety mesh fabric to support members and the support members to the truss mid-span lookouts and the pier lookouts as shown in the plans.

D Measurement

The Project Engineer will measure Jump Deterrent System (Horizontal) as a single unit of work for each structure bridge span and each bridge pier, acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.05	Jump Deterrent System (Horizontal)	EACH

Payment is full compensation for fabricating, furnishing, installing the safety mesh system on the midspan lookouts and the pier lookouts and all necessary accessories; preparing shop drawings and for furnishing all labor, equipment, tools and items necessary to complete the work.

22. Timber Bridge (B-13-937), Item SPV.0060.06.

A Description

This special provision describes providing the design, detailing, fabrication, delivery, construction and erection of the timber bridge spans in accordance to the lines, dimensions, elevations, and details as shown on the plans and provided in the contract. Conform to standard spec part 507 as modified in this special provision.

B Materials

B.1 Design Requirements

Structural design of the bridge shall be by a professional engineer registered in the State of Wisconsin and experienced in timber bridge design. The manufacturer shall be regularly engaged in the production of the specified product or item and be able to furnish independent records or references of competence and satisfaction of this fact upon the request of the Owner. Calculations shall verify species, size and grade of materials to be used in the manufacture of the timber bridge.

Design the bridge according to the most recent edition of the following specifications except as modified herein.

- 1. AASHTO LRFD Bridge Design Specifications, all current interims,
- 2. AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, 2nd Edition
- 3. Wisconsin Bridge Manual
- 4. American Wood Protection Association (AWPA) Standards, current edition
- 5. American Wood Council (AWC) National Design Specifications (NDS) for Wood Construction
- 6. American Institute for Timber Construction (AITC), Timber Construction Manual

B.1.1 Timber Spike Laminated Deck Superstructure

Timber spike laminated deck superstructure shall be a prefabricated longitudinal timber deck panel system as described in Chapter 23 of the WisDOT Bridge Manual.

Longitudinal deck panels shall be spike-laminated and span between supports. Deck width shall be comprised of multiple panels. Individual panel dimensions, thickness, species, and grade of timber shall be determined by the manufacturer.

Ship-lapped joint connections between adjacent panels shall be provided. Ship-lapped joints must be secured with drive spikes. The number and spacing of drive spikes shall be shown on design plans. Transverse spreader beams connecting multiple panels shall be provided and secured through the deck panels with bolts and locking hardware.

Timber wear plans for sidewalks, if shown in the plans, shall be 3-inch planks. Provide 3"x8" S1S1E (2-1/2" x 7-1/2") or approved equivalent with rough side up.

Individual panel dimensions shall be determined by manufacturer.

Panel thickness, species and grade of timber shall be determined by manufacturer. The design and supply of materials for proper longitudinal deck panel connection to bridge substructure shall be the responsibility of the manufacturer and must be shown on the shop drawings.

Each deck panel span shall be designed to accommodate the following loads:

- Pedestrian Live Load of 90 pounds per square foot (psf) with no reduction
- Vehicle Live Load of an AASHTO H-13 Truck
- Asphalt wearing surface dead load of 35 psf
- Future wearing surface load of 25 psf

B.1.2 Timber Railing

Timber rail system shall be included as part of longitudinal deck panel system. The rail system shall prevent a sphere with a diameter of 6" from passing through. The rail system shall be designed to carry a minimum design load of 50 pounds per lineal foot (plf), transversely and vertically, acting simultaneously on each longitudinal member.

All rails shall be smooth and continuous in nature with no protrusions that may cause snagging or scrapping.

The wood used for the rail system shall be treated with a water-borne preservative or oil-borne preservative in light petroleum solvent. The preservative is to be determined by the manufacturer and shall be clearly labeled in the shop drawings.

The rail system height shall be a minimum of 4'-6" (54") measured from the top of the deck's asphalt wearing surface (2" min.) to the top of the top horizontal rail.

The connection of rail components shall be to the longitudinal deck panels only. No connection of rail components to substructures will be permitted.

B.1.3 Timber Superstructure Support Blocks and Pile Caps

The timber superstructure support block and pile cap design shall be the responsibility of the bridge manufacturer and shall be coordinated with the contract plans. The design shall be based on the bridge superstructure reactions resulting from all required loading conditions.

Timber bridge and substructure anchorage details shall be dictated by bridge manufacturer and must be shown in the shop drawings.

B.1.4 Expansion Cover Plate Requirements

Checkered stainless steel cover plates shall be provided to cover the expansion gaps between the timber bridge segments over piers and abutments as shown in the contract plans. Cover plates shall be rigidly attached to the timber bridge deck with wooden screws provided by the manufacturer. The cover plate thickness shall be determined from the specified design live loading. All final details of cover plate size, thickness, wooden screws, and installation details shall be included in the shop drawings for review.

B.2 Plan Requirements and Submittals

Submit shop drawings and calculations to the engineer conforming to standard spec 105.2 for review and acceptance. The project engineer review does not relieve the contractor from responsibility for errors or omissions on shop drawings. Submit no later than 90 days after date of notification to proceed with the project and a minimum of 30 days prior to the date proposed to begin bridge element fabrication.

The plans and shop drawings shall be prepared on reproducible sheets 11 inch x 17 inch, including borders. Each sheet shall have a title block in the lower right corner. The title block shall include the WisDOT project identification number and structure number. Design calculations and notes shall be on 8-1/2 inch x 11 inch sheets, and shall contain the project identification number, name or designation of the wall, date of preparation, initials of designer and checker, and page number at the top of the page. All plans, shop drawings, and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

In the submittal, include the following:

- 1. Basic design criteria shown on the design plans.
- 2. Complete detailed drawings of all structural connections, sizes of members, span lengths between bearing points, skews, walkway widths, height of handrails and safety rails, bearing assembly details, anchorage locations and details, design data, materials data, and dead and live load bearing reactions.
- 3. Engineer's certification. The plans shall be sealed, signed, and dated by a professional engineer registered in the State of Wisconsin.
- 4. One set of design calculations with independent checks, as well as a bridge rating file for future WisDOT use.

The project engineer will return shop drawings from this submittal, and any subsequent submittals, either indicating acceptance or marked with required revisions and/or corrections.

B.3 Structural Timber

Lumber and timber shall meet the requirements of AASHTO M168. Glue laminated timber shall be manufactured using wet use adhesives.

Knotholes and holes from causes other than knots shall be measured and limited as provided for knots. All visible pieces of lumber and timber having knots that are unsightly in appearance shall be rejected. Cluster knots and knots in groups are not permitted.

Only pieces consisting of sound wood free from any form of decay shall be accepted. No piece of exceptionally lightweight timber shall be accepted.

Lumber and timber shall conform to the dimensions specified for either rough or surfaced stock.

Lumber and timber to be graded as per NFPA National Design Specifications for Wood Construction. All timber shall be grade #1 Coastal Douglas Fir, Southern Pine, or Hem-Fir.

B.4 Preservative Treatment

Preservative treatment of lumber and timber shall be by the pressure process, and unless otherwise provided in the contract special provisions, be in accordance AWPA Standards and AASHTO Designation M 133.

Lumber and timber shall be treated with Copper Naphthenate in Type A Hydrocarbon Solvent in accordance with AWPA P-36 and HSA-14 with retentions to meet AWPA UC4C. Other preservatives will not be accepted.

Unless otherwise directed by the Engineer the material shall be graded prior to treatment. Material shall be accepted after treatment on the basis of its condition prior to treatment, on the basis of inspection of the treatment procedure substantiated by plant records, on the condition of the material after treatment and on absorption, penetration and visual inspection.

So far as practicable all adzing, boring, chamfering, framing, gaining, mortising, surfacing and general framing, etc., shall be done prior to treatment. If cut after treatment, coat cut surfaces according to AWPA M4.

All Douglas Fir and other species that are difficult to penetrate shall be incised prior to treatment.

B.5 Hardware

All hardware (machine bolts, carriage bolts, drift pins, lag screws, dowels, rods, nails, spikes, washers, connectors, etc.) shall conform to ASTM 307-97.

Unless a Dome Head Bolt or approved equal is used, all bolt heads or tightening nuts in contact with Structural Timber and lumber shall have a washer of sufficient thickness and bearing area to ensure a minimum deformation of the contacted surface when tightened to develop not more than the maximum allowable tensile stress of that bolt

Bolt heads or tightening nuts in contact with metal surfaces shall have a cut washer or approved equal placed between the bolt head or nut and the metal surface.

All hardware shall be hot-dipped galvanized in accordance with AASHTO M111-91.

B.6 Timber Certification

Solid sawn timber members shall conform to the requirements of the grading rules agency for the species, type, and grade specified in the plans or special provisions. Glued-Laminated members shall conform to the American Institute of Timber Construction 117-201 for the combination, species, use, and appearance as specified in the plans or special provisions. A Grading Agency Certification is required on all timber material.

B.7 Manufacture

All lumber and timber shall be straight, well sawed, sawed squared at ends and have opposite surfaces parallel unless otherwise required by the plans and specifications.

Deck panels shall be assembled with 3/8" diameter ring shank spikes. All spikes are to be simultaneously driven with equal force using a mechanical press the full length of the deck, ensuring all heads are flush with the surface of the timber plank. Multiple impact tools are not to be used to set spikes because of potential for wood fiber rupture.

Deck panels to be delivered to jobsite after being fully assembled at fabrication plant.

All plank for deck panels shall be precision end trimmed to length with 1/4" under length and 1/4" overlength tolerance permitted.

B.6 Falsework and Bracing

The engineer will not require the contractor to use new or unused materials in falsework or bracing.

Use timber in falsework and bracing of adequate strength and shape, suitable for the purpose intended. Use material that is in good condition, sound, and free from defects that might impair its strength.

Falsework or temporary bracing shall not require preservative treatment.

C Construction

C.1 Delivery and Erection

Deliver the bridge by truck to the location that is nearest to the site and accessible by road. The contractor is responsible for unloading the bridge from the trucks at the time of arrival.

The manufacturer shall notify the contractor in advance of the expected arrival time. Information regarding delays after the trucks depart the plant such as inclement weather, delays in permits, rerouting by public agencies, or other circumstances shall be passed on to the contractor as soon as possible.

The manufacturer shall provide an erection procedure to the contractor and shall advise the contractor of the actual lifting weights, attachment points, and all other information needed to install the bridge. Unloading, splicing, bolting, and providing proper lifting equipment as well as all tools, equipment, labor, and miscellaneous items required to complete the work is the responsibility of the contractor. The procedure for field splices shall be given to the contractor by the manufacturer.

C.2 Workmanship

Spikes shall be driven to set the heads flush with the surface of the wood, thus ensuring the surface shall be free from deep or frequent hammer marks. Properly pre-drill holes for screws, nails, spikes, lags or bolts where necessary to avoid splitting of timber.

C.3 Handling

Lumber and timber shall be handled with sufficient care to avoid breaking through portions penetrated by treatment, and thereby exposing untreated wood. Chains, peavies, cant hooks, pickaroons, timber dogs, pike poles and other pointed tools that would burr, blemish, penetrate or permanently deform the contacted member shall not be used. Rope, rubber or fabric slings shall be used.

D Measurement

The Owner will measure Timber Bridge (B-13-937) as a single unit of work for each bridge span (between substructure supports), acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.06	Timber Bridge (B-13-937)	EACH

Payment is full compensation for designing, manufacturing, transporting, and erecting the timber bridge span; furnishing spikes, bolts, anchor bolts and all incidental items required for the Timber Bridge. The Project Engineer will pay separately for the asphaltic wearing surface on the deck.

23. Repair Existing Steel Superstructure, Item SPV.0060.07.

A Description

This special provision describes providing the fabrication, delivery, construction, and installation of missing structural steel plate and bolts in the existing steel superstructure of span 4 to the bridge's original "as built" condition, in accordance to the plans, the pertinent requirements of the standard specification, and as hereinafter provided.

B Materials

All steel plates, bolts and other material shall conform to standard spec part 506.

C Construction

The missing rivets on the north-east end of Span 4 steel superstructure (over Bent 1) shall be replaced with similar size ASTM F3125 A325 bolts (7/8-inch dia. expected).

The missing steel plate and rivets on the south-east end of Span 4 steel superstructure (over Bent 1) shall be replaced with similar size plate to the steel plate on the north-west end of Span 4 steel superstructure (over Pier 3). Verify hole spacing and size of at the missing plate location prior to fabrication. The plate shall be ASTM A709 Grade 36. New bolts shall be similar size to the missing rivets and be ASTM F3125 A325 bolts (7/8-inch dia. expected).

D Measurement

The Owner will measure Repair Existing Steel Superstructure as a single complete unit of work, acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.07	Repair Existing Steel Superstructure	EACH

Payment is full compensation for fabrication, delivery, construction, and installation of the missing structural steel plate and bolts in the existing steel superstructure of span 4 (above Bent 1). All incidental work required to perform the repairs shall be included

24. Cleaning Bearing Surfaces, Item SPV.0060.08.

A Description

This special provision describes cleaning the existing concrete bearing surfaces on a substructure unit on the bridge structure as directed by the engineer.

B Materials (blank)

C Construction

The contractor shall furnish all required equipment to clean organic material off the entire top surfaces of the substructure unit. Cleaning shall be done by cutting vegetation and power washing the top surface to clean concrete. All organic materials can be disposed of on the adjacent ground off of the substructure

unit. Use only mechanical means and power washing with water that conforms to 501.2.6 of the standard specifications.

Do not use any method that might damage the existing structural steel or the concrete surface. If damaged concrete is found under the organic material, repair the concrete per the standard specification "Concrete Surface Repair."

D Measurement

The Owner will measure Cleaning Bearing Surfaces as each individual substructure unit acceptably completed.

E Payment

Payment will be based on the measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.08	Cleaning Bearing Surfaces	EACH

Payment for Cleaning Bearing Surfaces is full compensation for cleaning the designated bearing surface at each substructure unit and disposing of any organic waste materials.

25. Gateway Signs, Item SPV.0060.09

A Description

This special provision describes providing two fully engineered, fabricated gateways signs to be placed at the abutments of the structure B-56-258. Basis of design is to use same materials as described in the prefabricated Steel Bridge as described in the project documents. Regard these specifications as minimum standards for design and construction.

B Materials

B.1 Approved Manufacturers

The gateway signs shall be designed and manufactured using similar materials as described in SPV.0060.0. An approved designer and supplier shall be selected from the Wisconsin Department of Transportation approved products list for prefabricated steel truss bridges.

To be eligible for this project, pre-fabricated gateway structures from other manufacturers must be preapproved before the bid opening date. Applications for pre-approval must be submitted at least 10 business days prior to bid opening date. To ensure the proposed manufacturer will comply with these specifications, the following documentation must be included:

- Proof of AISC shop certifications
- Representative design calculations
- Representative shop drawings
- Splicing and erection procedures
- Welding process / Welder qualifications
- References and list of similar projects

The Project Engineer will evaluate and verify the accuracy of the submittal. If the Project Engineer determines that the qualifying criteria have not been met, the proposed manufacturer shall be rejected. Manufacturers other than those listed in the Wisconsin Department of Transportation approved products list may only be used if the Project Engineer provides written approval of the proposed manufacturer 5 business days prior to the bid opening date. All rulings are final.

B.2 Plan Requirements and Submittals

Submit shop drawings and calculations to the Project Engineer. Project Engineer review does not relieve the contractor from responsibility for errors or omissions on shop drawings.

Make the submittal no later than 12 weeks after date of notice of contract approval. Allow the following time period in the construction schedule: 20 calendar days after the first receipt of plans by the Project

Engineer for a complete initial review of the design and plans submittal, and an additional 20 calendar days for any necessary revisions and/or corrections.

In the submittal, include the following:

- 1. Basic design criteria shown on the design plans.
- 2. Complete detailed drawings of all structural steel connections, sizes of members, anchor bolt locations, masonry façade, design data, and materials data.
- 3. One set of design calculations with independent checks.

The Project Engineer will return shop drawings from this submittal, and any subsequent submittals, to the fabricator, either indicating acceptance or marked with required revisions and/or corrections.

Colors and Finishes for the masonry shall be submitted to the Engineer in conjunction with the Gateway Structure submittal.

B.4 Weld Testing

An independent agency shall perform nondestructive weld testing; the manufacturer shall pay for this testing. All welds are to be visually inspected except as noted below.

Ten percent of all fillet welds shall be magnetic particle tested.

Submit electronically a written testing report upon completion.

C Construction

C.1 Delivery and Erection

The manufacturer is responsible for the safe storage of all prefabricated gateway sign components until final delivery to the project site. Materials stored outside, which could be adversely affected by exposure to the weather, shall be protected in order to maintain their original as-fabricated condition.

Deliver the gateway sign structure by truck to the project site. Coordinate with the bridge contractor on the recommended delivery location and time of arrival. Delivery, hauling permits and freight charges are the responsibility of the manufacturer.

The manufacturer shall notify the bridge contractor in advance of the expected arrival time. Information regarding delays after the trucks depart the plant such as inclement weather, delays in permits, rerouting by public agencies, or other circumstances shall be passed on to the bridge contractor as soon as possible.

The manufacturer shall provide an erection procedure to the bridge contractor and shall advise the contractor of the actual lifting weights, attachment points, and all other information needed to install the bridge. The procedure for bolting field splices shall be given to the bridge contractor by the manufacturer.

Unloading, splicing, bolting, and providing proper lifting equipment as well as all tools, equipment, labor, and miscellaneous items required to complete the work is the responsibility of the bridge contractor and is inclusive to this special provision.

C.2 Finishes (Steel)

All steel used in prefabricated gateway signs shall be unpainted and self-weathering. Fabrications shall be produced from high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing, ASTM A606 sheet, and/or ASTM A588, ASTM A242, or ASTM A709 Grade 50W plate and structural steel shapes (F_y =50,000 psi) with a minimum corrosion index of 5.8 per ASTM G101.

Blast-clean all exposed surfaces of weathering steel according to Steel Structures Painting Council Surface Preparation Specifications No. 7 Brush-Off Blast Cleaning (SSPC-SP7), latest edition. Exposed surfaces of weathering steel shall be defined as those surfaces seen from final construction of the Gateway Sign Structure.

C.3 Finishes (Masonry)

Masonry finish shall be 1 ½" thick stone veneer grouted over metal lath, with precast concrete caps with a drip edge. Finishes shall be submitted to the Engineer. Precast caps sections shall be placed in such a way that limits the visibility of construction joints. All joints shall be sealed with backer rod and sealant of

a color matching the caps. Place weeps in masonry to prevent trapped water and seal gaps between steel and masonry with sealant.

D Measurement

The Owner will measure the two (2) gateway sign structures as a single unit of work for both structures, acceptably completed.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.09	Gateway Signs	Each

26. East Access Road, Item SPV.0060.10

A Description

This special provision describes providing temporary access as shown in the project documents, Along the East shore of the Wisconsin River. The temporary access as shown in the project documents is the maximum allowable impact perimeter by WisDNR. Contractor shall determine means, methods and materials to construct this access within the permitted disturbance area. This access shall be constructed.

B Materials

Swamp mats will be used on the temporary construction access route through the wetland areas.

All seeding, fertilizer, and topsoil restoration shall be in compliance with the Wisconsin DOT Standard specifications and as detailed in the project documents. Payment for restoration shall be included in the each item of this special provision.

C Construction

The contractor shall furnish all required labor and equipment to clear and grub, removals, erosion control, overall access grading, site preparation, maintaining, removing, restoration, and any other items as needed to provide access as displayed on the contract drawings for the East Access Road. Restoration includes disturbed areas between the two structures B-56-258 and B-13-937, east access road and east abutments of B-13-937.

D Measurement

The Owner will measure East Access Road as a single complete unit of work, acceptably completed.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.10	East Access Road	Each

27. East Water Access, Item SPV.0060.11

A Description

This special provision describes constructing, maintaining, removing and restoring a temporary Causeway and shoreline access into the Wisconsin River as shown in the project documents. The temporary access as shown in the project documents is the maximum allowable impact perimeter by WisDNR. Contractor shall determine means methods and materials to construct this access within the permitted disturbance area. Alternatives such as temporary bridges, other spans, or crib structures are acceptable provided impact footprint does not exceed that shown on the drawings and flow capacity of channel is maintained to an equal or greater level than what is depicted on the drawings. This access shall be constructed.

B Materials (blank)

C Construction

The contractor shall furnish all required labor and equipment to clear and grub, removals, overall grading, site preparation, temporary access dock, maintenance, removals, restoration and any other items as needed to provide access as displayed on the contract drawings for the East Water Access.

A list and/or map will be provided showing all properties impacted by an increase in the Base Flood Elevation mapping. The engineer will notify the impacted landowners of the expected impacts to their properties. An emergency plan will identify the steps the Engineer, Contractor, and Owners propose to mitigate potential flooding impacts including specific stages in the river elevation that may include: Monitoring river levels and extreme weather forecasts, the removal of construction equipment, adjustments or breaching of any instream elements, or other necessary efforts to mitigate to an acceptable or minimal level of impact to the Base Flood Elevation.

D Measurement

The Owner will measure East Water access as a single complete unit of work, acceptably completed.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.11	East Water Access	Each

28. West Access Road, Item SPV.0060.12

A Description

This special provision describes providing temporary access as shown in the project documents along the West shore of the Wisconsin River. The temporary access as shown in the project documents is the maximum allowable impact perimeter by WisDNR. Contractor shall determine means, methods and materials to construct this access within the permitted disturbance area. This access shall be constructed at the discretion of the contractor.

B Materials

Swamp mats will be used on the temporary construction access route through the wetland areas.

All seeding, fertilizer, and topsoil restoration shall be in compliance with the Wisconsin DOT Standard specifications and as detailed in the project documents. Payment for restoration shall be included in the each item of this special provision.

C Construction

The contractor shall furnish all required labor and equipment to clear and grub, removals, overall access grading, site preparation, erosion control, culverts, maintenance, final removals, restoration and any other items as needed to provide access as displayed on the contract drawings for the West Access Road, abutments for B-56-258 and West trail connections.

D Measurement

The Owner will measure West Access Road as a single complete unit of work, acceptably completed.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.12	West Access Road	Each

29. West Water Access, Item SPV.0060.13

A Description

This special provision describes providing temporary access as shown in the project documents along the West shore of the Wisconsin River. The temporary access as shown in the project documents is the maximum allowable impact perimeter by WisDNR. Contractor shall determine means, methods and materials to construct this access within the permitted disturbance area. Alternative water access

construction methods/types at this location is allowable provided impact footprint as shown on drawing is not exceeded. This access shall be constructed at the discretion of the contractor.

B Materials (blank)

C Construction

The contractor shall furnish all required labor and equipment to clear and rub, removals, overall access grading, site preparation, temporary access dock, culverts, maintenance, final removals, restoration, and any other items as needed to provide access as displayed on the contract drawings for the West Water Access.

D Measurement

The Owner will measure west Water access as a single complete unit of work, acceptably completed.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.13	West Water Access	Each

30. Stop Sign Flasher System, Item SPV.0060.14

A Description

This Work consists of furnishing and installing a Stop Sign Flasher System as described herein and shown in the plans.

B Materials

B.1 General

All materials shall be capable of continuous operation within a minimum temperature range of -40° to 140° F (-40° to 60° C).

Post materials shall conform to all the pertinent requirements of the Wisconsin Department of Transportation Standard Specification Section 634.2.5.

B.2 Signs

All signs shall conform to MUTCD standards and Wisconsin Department of Transportation Standard Specifications 637.

All signs shall be supplied and mounted as shown in the permanent sign plan sheets. Signs shall contain adequate holes and appropriate hardware for securely mounting to a pole or post.

All LED lighting units shall conform to MUTCD optical requirements for color, flash rate, and dimming.

All LED lighting units shall be securely imbedded around the perimeter of the sign face.

LED lighting units shall be amber in color and shall be wired such that should an LED unit fail, all remaining LED lighting units continue to operate.

B.3 Battery

The Battery shall be a replaceable 12 V DC sealed lead-acid, Absorbed Glass Mat (AGM), maintenancefree battery, or approved equal.

The Battery shall conform to Battery Council International (BCI) specifications and shall be rated at 45 Ah minimum, or an approved alternative which meets power consumption, activation, and autonomy requirements for the Stop Sign Flasher System. Calculations shall be provided. The Battery shall be sealed within a plastic film to resist damage from moisture and corrosion.

The battery shall be mounted inside the Controller Circuit housing or in an approved alternate location.

All battery connectors shall conform to Ingress Protection IP67 rating, dust-proof, and protected from temporary immersion in water up to 3 feet deep for 30 minutes. Connectors shall be Deutsch DTM series or approved equal.

The battery shall be replaceable independent of all other components.

Autonomy with a fully charged battery shall be a minimum of 14 days without sunlight, dependent upon ambient temperature and number of activations. The battery shall have a capacity capable of providing up to 30 days of autonomy. Solar calculations shall be provided.

B.4 Solar Array

The Solar Array shall provide 10 watts minimum and 65 watts maximum peak total output or approved system that will provide enough power for the system for the specified amount of time and activation cycles. Solar calculations shall be provided for the specified wattage.

The Solar Array shall be affixed to an aluminum plate and bracket and shall securely mount to the provided sign or to the sign's support, per manufacturer's recommendations and supplied anti-vandal hardware.

The Solar Array shall be adjustable to an angle 45° to 60° from vertical to facilitate adjustment for maximum solar collection.

The Solar Array assembly (Solar Array and mounting plate and bracket), shall be mounted to the Support Assembly utilizing hardware capable of 360° of rotation about the Pedestal Shaft to facilitate adjustment for maximum solar collection.

C Construction

Assemble and mount the Stop Sign Flasher System per the plans and details and the manufacturer's recommendations.

D Measurement

The Owner will measure Stop Sign Flasher System by the system, acceptably completed.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.14	Stop Sign Flasher System	Each

Payment for Stop Sign Flasher System shall be considered full compensation for equipment, labor and materials required to complete the Work.

31. Permanent Signing, Item SPV.0060.15

A Description

This Work consists of furnishing and erecting furnishing steel posts to support signs, and for providing and installing signs on supports as described herein and shown in the plans.

B Materials

All materials shall conform to all the pertinent requirements of the Wisconsin Department of Transportation Standard Specification Sections 634.2.5 and 637.2.

C Construction

Work shall conform to all the pertinent requirements of the Wisconsin Department of Transportation Standard Specification Sections 634.3 and 637.3.

D Measurement

The Owner will measure Permanent Signing by each location, acceptably completed.

E Payment

The Owner will pay for measured quantities at the contractor unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.15	Permanent Signing	Each

Payment for Permanent Signing shall be considered full compensation for providing, hauling, and placing the posts; treating cut post ends; providing hardware and anchors; providing signs including mounting

hardware and temporary flags; and for preserving and resetting sign location stakes. The owner will not pay for replacing damaged posts or upper tube cut-offs.

32. Drilled Shaft Foundation 108-Inch, Item SPV.0090.01

A Description

This special provision describes installing drilled shafts for structure foundations as shown on the plans.

A.1 Qualifications of the Contractor

The contractor performing the work described in these special provisions must have successfully completed drilled shaft projects within the last 5 years. The contractor must submit a list outlining their experience on at least five projects where they have successfully completed drilled shaft construction, including one project completed within the last 5 years. The project experience must include at least one project completed in soil and groundwater conditions similar to those anticipated for this project. The project experience must include advancing the drilled shafts to a depth of at least 30 feet below the original ground surface. At least one project must show evidence of permanence with a 5-year minimum age. The project experience documentation for each project must include a brief project description; detail the size of the shafts, construction methods used during installation, methods used for wall stabilization, local soil conditions, actual construction time and contact information consisting of an individual's name and current phone number. Contacts must be capable of verifying project participation.

The contractor must submit staff experience records of the engineer, drill operators, and onsite supervisors and crew chiefs who will be assigned to the project. The staff records must contain a summary of each individual's experience, and it must be complete enough for the Project Engineer to determine whether each individual has satisfied the following qualifications.

The contractor must assign an engineer to supervise the work who has at least eight years of drilled shaft experience and who has completed at least one drilled shaft project. The assigned engineer's project experience must include at least one project completed in soil and water conditions similar to those anticipated for this project. The contractor may not use consultants or manufacturer's representatives in order to meet the requirements of this section. Drill operators, and onsite supervisors and crew chiefs must have a minimum of one-year experience installing drilled shafts with the contractor's organization.

Submit the contractor's qualifications and staff experience records at the preconstruction meeting or 14 calendar days prior to the start of drilled shaft construction, whichever date is earlier. The Project Engineer will accept or reject the contractor's qualifications and staff experience records within 14 calendar days after receipt of the submission. Do not start work on any drilled shaft piers until acceptance of the contractor's qualifications, staff experience, and drilled shaft installation plan is given by the Project Engineer. The Project Engineer may suspend the drilled shaft work if the contractor substitutes unqualified personnel for accepted personnel during construction. If work is suspended due to the substitution of unqualified personnel, the adjustment in contract time resulting from the suspension of work will not be allowed.

B Materials

B.1 General

Concrete, drilling fluid, reinforcement and formwork shall conform to the requirements of QMP Drilled Shafts and the standard specifications.

In the event that the provisions of other specification clauses cause ambiguity or conflict with the requirement of these special provisions, these special provisions shall take precedence unless otherwise accepted by the Project Engineer.

B.2 Equipment

Equipment used for excavation, drilling, and cleaning operations shall have adequate capacity including power, torque, and down thrust to excavate a hole to a depth equal to the maximum depth of the drilled shafts shown in the plans plus 15 feet, or plus 20 percent of their maximum depth, whichever is greater. Anticipate and make available at the job site all equipment necessary and essential to penetrate soft and hard soils, as well as obstructions, during the construction of the drilled shafts.

Where hard soils, or other material including natural or man-made obstructions are encountered and cannot be drilled using conventional earth or rock augers, drilling buckets, and/or over reaming tools; provide drilling equipment including, but not limited to rock core barrels, rock tools, down the hole

hammers, chisels, air tools, or any other equipment necessary to construct the drilled shaft excavation to the depth and size as shown on the plans.

When applicable, or required by the Project Engineer, provide equipment that produces a stable slurry suspension, mechanical agitation, and a pipeline or other safe methods of transporting the slurry to the drilled shaft.

B.3 Permanent Casing

Permanent casing shall be steel that minimally conforms to ASTM A36. Substitution of steel material with properties meeting or exceeding ASTM A36 may be used if approved by the Project Engineer. Supply casing of the minimum length to achieve the length shown on the plans plus an additional 2 feet minimum embedment into the shaft concrete. Permanent casing shall be rigid, smooth, clean, watertight, and of ample strength to withstand both handling and installation stresses and the pressure of both concrete and the surrounding earth materials. The outside diameter of casing shall not be less than the specified size of the drilled shaft. All casing diameters shown on the plans refer to O.D. dimensions.

B.4 Reinforcing Steel and Spacers

Deformed reinforcing bars shall comply with the size, dimension, spacing, and details shown on the plans. In addition, they shall conform to AASHTO M31, Grade 60, and all the pertinent requirements of the Wisconsin Department of Transportation Standard Specification Section 505. Non-corrosive wheel type spacers and boots shall be used to properly position the reinforcing steel. All reinforcing steel shall be 100% wire tied between the vertical reinforcement and ties.

B.5 Crosshole Sonic Logging Tubes

Access tubes for CSL testing shall be 2 inches inside diameter (I.D.) schedule 40 steel pipe conforming to ASTM A53, Grade A or B, Type E, F, or S. Pipes shall have a round, regular I.D., free of defects or obstructions; including any defect at the pipe joints, to permit the free unobstructed passage of source and receiver probes. Each tube or steel pipe shall be fitted with a watertight shoe onto the bottom and a removable cap at the top. Both, shoe and cap shall be watertight and free from corrosion, and the internal and external faces of the tubes clean to ensure passage of the probes and good bond with the concrete.

C Construction

C.1 Drilled Shaft Installation Plan

C.1.1 General

Prepare a Drilled Shaft Installation Plan and submit it at the preconstruction meeting or at least 14 calendar days prior to beginning drilled shaft foundation construction, whichever date is earlier. Submit the Drilled Shaft Installation Plan to the Project Engineer for review. The Project Engineer will accept the plan as submitted or return the plan with requested revisions. Do not start any drilled shaft installation plan until the Project Engineer accepts the Drilled Shaft Installation Plan. Acceptance of the installation plan does not relieve the contractor of responsibility for successful completion of the drilled shafts.

C.1.2 Submittals

The submitted Drilled Shaft Installation Plan shall include the following:

- a. **Job Site Visit**. The contractor shall acknowledge that the job site was visited to verify the site conditions with regard to entrance, access, overhead lines, subsurface features, clearing and grubbing, permitting, and collecting all information necessary to plan and execute the installation of the drilled shafts.
- b. **Plan to Protect Existing Structures**. Outline the steps to be taken during drilled shaft installation to protect adjacent or nearby structures.
- c. **Details of Environmental Control Procedures**. Provide plan to prevent loss of slurry or concrete into waterways, project areas, or protected areas. Detail method to ensure the compliance with state and federal environmental regulations during drilled shaft construction.
- d. List of Proposed Equipment. Include details of proposed templates; number and sizes of cranes; number and sizes of oscillators; number and sizes of drills, include rotary torque, crowd force drills, and maximum drilling depth; diameter, length, and reach of augers, bailing buckets, guide walls, templates, and roller bits; cleaning equipment including cleaning buckets, submersible pumps, or air-lifted pumps; size of de-sanding equipment and slurry pumps; soil/rock-coring sampling

equipment; inspecting drilled shaft apparatus; length and diameter of tremie or size of concrete pumps; size, length, and thickness of casings; over reaming equipment; and all relevant equipment necessary to complete the drilled shaft installation. Acceptance of the installation plan by the Project Engineer does not relieve the contractor responsibility to provide other equipment, if necessary, to achieve satisfactory shaft installations meeting the requirements of this special provision.

- e. Details of Sequence of Drilled Shaft Installation and Time for Construction Operations. Include a layout of the drilled shaft installation sequence and setting template(s). Include time for installing casings, sealing casing, excavation and/or drilling time, drilled shaft cleaning, rock coring, drilled shaft inspection, concrete placement. The contractor should consider the effect of construction operations of one drilled shaft onto the adjacent drilled shaft(s) and avoid construction conflicts that will affect the quality or integrity of the completed work. Indicate when and what construction sequence modifications shall be performed under atypical situations, i.e., weekend or holiday shutdowns, or unanticipated shutdowns due to equipment issues.
- f. **Proposed Drilled Shaft Installation Procedure(s)**. Provide details of the proposed shaft installation procedures, including coring or drilling boulders, rock or obstructions or steep sloping surfaces, when required, and meeting the minimum installation requirements set forth in subsection C.3. Method for identification of the competent or bearing material before finalizing the excavation. Method for monitoring verticality of the drilled shaft walls during excavation, and details of proposed corrective measures to be implemented for shafts out of tolerance. Details of the means and methods of preventing displacement of the casing and/or drilled shaft during installation.
- g. **Details of Slurry Operations.** This is required if slurry is used to stabilize the bottom of the excavation within the casing. Include slurry type, methods to mix, circulation, desanding, and test the slurry to comply with these special provisions.
- h. **Inspection and Cleaning**. Methods to clean and inspect the drilled shaft excavation prior to reinforcement placement.
- i. **Crosshole Sonic Logging (CSL).** Method to install and secure the crosshole sonic logging (CSL) pipes to the reinforcing cage along with the proposed selection of pipe and size.
- j. Details of Steel Reinforcement Placement During Construction. Include methods to ensure cage centering and cover; cage integrity while lifted during placement, number of cranes, number of lift points, and number of spreader bars; number and location of bottom and side spacers; cage support; and tie downs during concrete placement.
- k. Concrete Placement Plan. The purpose of the Concrete Placement Plan is to ensure that sufficient concrete is at the job site or in transit to the job site so that the entire pour can be done without delay. Include location of the concrete plant, number of trucks, estimated delivery times, estimated time between trucks, and number of trucks at the site before placement begins. Indicate the use of tremie or concrete pump lines and details of the seal to be used at the bottom end of the tremie or concrete pump line. Breakdowns of concrete plants, trucks, or traffic problems shall be considered under this Concrete Placement Plan. Contractor must be aware of batch, travel, and concrete placement times. Include an estimate of the concrete placement and over pouring time per drilled shaft. When applicable, detail excavation to grade and finishing of the drilled shafts.
- I. **Casing Removal**. Include the details and means by which the contractor intends to remove any contractor required temporary casings.
- m. Setting Permanent Casings. Include details and means of setting the permanent casing where shown in the plans. Include details on method of removing or otherwise avoiding the over pour shaft concrete displaced above the bottom of the socket from being permanently trapped inside the permanent casing.
- n. Methods of Handling and Disposal of Spoil Excavation, Waste Slurry, Waste Concrete, and Drilled Shaft Cutoffs. Present sufficient details to the Project Engineer to evaluate the adequacy and compliance of the contractor's methods of disposal with the standard specifications, including all related environmental permits and local regulations.
- o. Other Information requested on the plans or by the Project Engineer.

p. Reinforcing Steel Assembly and Installation Plan. For shafts with a 6'-0" minimum nominal diameter and 60'-0" minimum length, prepare and submit the reinforcing steel assembly and installation plan. Reinforcing steel shop drawings, details of reinforcement placement, including bracing, centering, and lifting methods, and the method to assure the reinforcing cage position is maintained during construction, including use of bar boots and/or rebar cage base plates, and including placement of rock backfill below the bottom of shaft elevation shall comply with the pertinent requirements of the specifications.

The reinforcing steel assembly and installation plan shall include:

- 1. Procedure and sequence of steel reinforcing bar cage assembly.
- 2. The tie pattern, tie types, and tie wire gauges for all ties on permanent reinforcing and temporary bracing.
- 3. Number and location of primary handling steel reinforcing bars used during lifting operations.
- 4. Type and location of all steel reinforcing bar splices.
- 5. Details and orientation of all internal cross-bracing, including a description of connections to the steel reinforcing bar cage.
- 6. Description of how temporary bracing is to be removed.
- 7. Location of support points during transportation.
- 8. Cage weight and location of the center of gravity.
- 9. Number and location of pick points used for lifting for installation, and for transport (if assembled off-site).
- 10. Crane charts and a description and/or catalog cuts for all spreaders, blocks, sheaves, and chockers used to equalize or control lifting loads.
- 11. The sequence and minimum inclination angle at which intermediate belly rigging lines (if used) are released.
- 12. Pick point loads at 0, 45, 60, and 90 degrees and at all intermediate stages of inclination where rigging lines are engages or slackened.
- 13. Methods and temporary supports required for cage splicing.
- 14. For picks involving multiple cranes, the relative locations of the boom tips at various stages of lifting, along with corresponding net horizontal forces imposed on each crane.

C.1.3 Acceptance

The Project Engineer will evaluate the Drilled Shaft Installation Plan for conformance with the requirements of these special provisions. Within 14 calendar days after receipt of the Drilled Shaft Installation Plan, the Project Engineer will notify the contractor of the acceptance of the plan, or of additional information and/or changes required. Any unacceptable part of the Drilled Shaft Installation Plan will require resubmission. The contractor must resubmit the Drilled Shaft Installation Plan for evaluation and review with the necessary changes or additional information provided. The Project Engineer will provide a written notice of acceptance or rejection of contractor's resubmitted Drilled Shaft Installation Plan within 14 calendar days after its receipt. The accepted contractor's Drilled Shaft Installation Plan will be subjected to trial and satisfactory performance in the field, and the Project Engineer will grant final acceptance of the plan after its satisfactory field performance.

After assessment or reassessment of the Drilled Shaft Installation Plan has been made and the Project Engineer has granted its acceptance, do not make any changes to the plan without written consent of the Project Engineer.

C.2 Drilled Shaft Installation

C.2.1 General

Construct drilled shaft foundations conforming to the accepted Drilled Shaft Installation Plan. The resulting installation plan shall include length of permanent casing, grouting or other methods to stop loss of drilling fluid or concrete or collapse of soil, details of the constituent materials of any drilling fluid used for stabilization, the method of inspection, details of the concrete design mix, concreting method, the

minimum time between the completion of one shaft and the commencement of the next, and the pattern of construction.

Ensure that damage does not occur to the completed shafts through their working methods. Submit to the Project Engineer a drilled shaft installation sequence. The proposed sequence and timing of shaft installation shall be such that the installation work shall not cause any damage to adjacent shafts. The shaft installation shall not commence until acceptance of the Project Engineer has been obtained.

C.2.2 Subsurface Conditions

Neither the Owner nor the Project Engineer will accept responsibility for any opinions or conclusions given in any factual or interpretative site investigation reports. Report immediately to the Project Engineer any circumstance, which indicates that in the contractor's opinion the ground conditions differ from those reported in or which could have been inferred from the ground investigation reports or test results.

C.2.3 Sequence of Shaft Installation

The Project Engineer reserves the right and the contractor shall recognize such right to direct the installation of working shafts in any sequence the Project Engineer deems necessary for the satisfactory completion of the work.

C.2.4 Templates

The contractor may elect the use of templates, which will be used in the installations of the shafts to meet the tolerances specified in these special provisions.

C.2.5 Temporary Working Surface

The contractor should use a temporary working surface to provide a level surface at the top of shafts for drilling where needed.

C.2.5.1 Forcible Correction

Where shafts have not been positioned within the specified limits no method of forcible correction will be permitted.

C.2.6 Records

Keep a record of all shafts installed. Give a copy of the record of the work done each day to the Project Engineer within 24 hours of that day's work being completed. The Project Engineer will accept the record form before drilled shaft works commence. Incorporate any comment by the Project Engineer into the record form. Note all unexpected drilling or installation conditions in the records.

C.2.7 Drilled Shaft Installation

C.2.7.1 General

The dry method or wet method can be used as necessary to produce a sound and durable structure foundation free of defects. When a particular installation method is required in the special provisions, only that method of construction shall be used. If no particular method is specified for use, select and use one of the methods of construction cited above as determined by the site conditions and needed to properly accomplish the work. Submit to the Project Engineer for acceptance the selected method of construction in the Drilled Shaft Installation Plan described in these special provisions.

Where soil and groundwater conditions vary along the site, a single method of construction may be not appropriated for the entire job site; and one, two, or a combination of methods may be used.

Consider using temporary casing at all sites where the use of the slurry installation method is not possible and where the use of casing, other than surface casing, is necessary to keep the shaft excavation stable.

In other cases, where drilling through materials having a tendency to squeeze or cave and caving or squeezing cannot be controlled by the drilling fluid, advance permanent casing through the unstable condition(s) and to the projected depth by twisting, drilling, or vibrating. Obtain prior approval from the Project Engineer for vibrating the casing. After the casing is in place, excavate inside the casing to the projected shaft tip elevation using the dry or wet excavation techniques described below. Clean the bottom of the excavation; test the drilling fluid for compliance with these special provisions, if applicable. Before withdrawing the temporary casing, ensure that the level of fresh concrete inside the casing is at such level that the pressure of its hydrostatic head displaces up and out the fluid trapped between the

annular space between the casing and the drilled shaft wall. The Project Engineer may require the contractor to overream the outside diameter of the drilled shaft before placing the permanent casing.

C.2.7.2 Dry Method

The dry method of drilled shaft installation shall be considered only in conjunction with permanent casing.

The dry installation method consists of drilling the shaft excavation, removing, and cleaning all accumulated loose material from within the cased excavation, placing the reinforcement cage, and pouring the concrete in the dry excavation. This method may be used below the water table when 1-1/2 inches or less of seepage accumulates at the bottom of the drilled shaft excavation over a 1-hour period, and when the sides and bottom of the shaft remain stable without detrimental caving, sloughing, or swelling for a minimum of a 4-hour period. Seepage is defined as the cumulative inflow of groundwater through the voids of the saturated soil mass into the drilled shaft excavation. Measurement of the seepage quantity (depth at bottom of hole) shall be done without any seepage water being pumped out of the shaft excavation by a pump or similar device. Should seepage water accumulate and be present inside the excavation to a depth of greater than 3 inches at any time prior to concreting, then free fall concrete cannot be placed; instead, employ the tremie or pump procedures to direct the concrete into the excavation.

C.2.7.3 Wet Method

Use the wet installation method, or the casing installation method, for drilled shafts that do not meet the requirements of the dry installation. The wet installation method shall be considered also at all sites where it is impractical to provide a dry excavation for drilling and placing concrete in the drilled shaft. Use the wet method for excavations above or below the water table and with or without casings, depending upon soil type and groundwater conditions. When using the wet method below the groundwater table, all drilled shaft operations shall be accomplished while maintaining a positive head of fluid above the water table. A temporary surface casing may be provided to aid in positioning and aligning the drilled shaft and to prevent sloughing of the superficial material.

When using the wet installation method, follow the following steps:

- a. Drill the excavation and keep the drilled shaft always filled with fluid such as water, natural slurry, or slurry.
- b. During excavation, test the properties of the fluid for compliance with these specifications, clean or desand the fluid as applicable.
- c. Clean the bottom of the excavation with a bailing bucket, an airlift, a submersible pump, or other devices after the excavation is completed.
- d. Just before lowering the reinforcing cage, test the fluid for conformance with the specifications.
- e. Pour the concrete with a tremie pipe or a pump line extending to bottom of the excavated shaft to displace the fluid up and out of the shaft.

C.2.8 Excavations

C.2.8.1 General

Excavations required for the drilled shafts shall be performed through whatever materials encountered, of the dimensions and to the elevations shown in the plans, or as directed by the Project Engineer. The excavation and installation method shall be suitable for the intended results and materials encountered. Blasting is not permitted.

Maintain a construction log during the drilled shaft excavation. Include on the construction log information such as ground elevation, surface water elevation, groundwater elevation, sequence number, method of installation, machines and tools employed, drilling fluids employed, drilling times, excavated materials and their particular elevations, soil/rock-cores samples and their particular elevations, rock sockets and their elevation, bells plus their size and elevations, and all other information relevant to the excavation process that will assist the Project Engineer in evaluating the foundation. Information shall also include proposed methods for disposal of excavated material and slurry conforming to state and local environmental regulations, codes and ordinances, the standard specifications, or as directed by the Project Engineer.

Sidewall overreaming shall be required when the sidewall of a drilled shaft as determined by the Project Engineer have either softened due to, but not limited to, excavation methods, swelled due to delays in concreting, or degradation because of slurry cake buildup. The Project Engineer shall direct the thickness

and extent of sidewall overreaming. However, overreaming thickness shall be 1/2-inch minimum and 3 inches maximum. The contractor shall bear all the costs associated with sidewall overreaming and concrete required to fill the additional overreaming volume of excavation.

C.2.8.2 Templates

Templates will be required for the installation of drilled shaft foundations if the contractor cannot demonstrate and consistently achieve during construction, proper position and alignment of the installed drilled shaft foundations within specified tolerances without templates.

C.2.8.3 Protection of Existing Structures

Take all reasonable precautions to prevent damage to existing structures and utilities. These measures shall include, but are not limited to, vibration monitoring or subsidence control during installation of casings, sheets, or drilling operations.

C.2.8.4 Overburden Drilled Shaft Excavation

Provide the necessary equipment to remove and dispose of all materials encountered in forming the drilled shaft excavation to the dimension and elevation as shown on the plans, or as directed by the Project Engineer. Contractor's equipment may include, but are not limited to, augers and rotary drills. Unless otherwise shown on the plans, the drilled shaft excavations in overburden materials shall be vertical bored holes extending from the ground surface down to design tip elevation or the competent soil material, whichever is greater, where competent soil material is defined as the soil that will provide support and satisfactory performance to the structure.

In case of groundwater or severe seepage condition, with the flow of water very difficult to control, take appropriate measures including excavation with drilling fluid or excavation through a casing as indicated in the Drilled Shaft Installation Plan.

C.2.8.5 Obstructions

Remove obstructions at drilled shaft locations. Obstructions may include natural and man-made materials, such as old reinforced steel concrete foundations or natural materials such as boulders. Boulders are defined as stones greater than 12 inches. Special tools and/or procedures shall be used when the contractor cannot advance the hole more than one foot in thirty minutes using conventional rock augers fitted with teeth, drilling buckets, or underreaming tools operating at maximum power, torque, and down thrust. Special procedures/tools may be required but are not limited to chisels, boulder breakers, core barrels, air hammer tools, and hand excavation. Other methods for obstruction removal such as temporary casing or hole diameter increase can be employed to aid in the removal. Blasting shall not be permitted.

C.2.8.6 Lost Tools

Drilling tools that are lost in the excavation shall not be considered obstructions and shall be promptly removed. All costs due to removal of lost tools shall be borne by the contractor including costs associated with hole degradation during removal operations or time while the hole remains open.

C.2.8.7 Inspections and Cleanliness of Excavation

Provide the details of drilled shaft inspection and cleanliness within the Drilled Shaft Installation Plan, required by subsection C.1.2 of this specification. Provide equipment and tools for checking the dimensions and alignment of each drilled shaft excavation, and coordinate schedules for inspection of the excavation with the Project Engineer. Determine dimensions, alignment, and final depth of the drilled shafts after final cleaning. A borehole camera with visual sediment depth measurement gauge shall be provided by the contractor for inspection of the walls and bottom of the drilled shaft excavation prior to placement of the rebar cage and concrete. After the drilled shaft excavation has been prepared for inspection, notify the Project Engineer. The cleanliness and the bearing surface of the drilled shafts will be evaluated and accepted by the Project Engineer. Unless the Project Engineer specifies otherwise, the contractor's cleaning operation shall be considered sufficient when no more that 50 percent of the bottom area of each shaft has less than 1/2-inch of sediment or debris at the time of hole acceptance just prior to steel positioning and concrete placement. The maximum depth of sediment or any debris at any location on the bottom of the shaft shall not exceed 1-1/2 inches before beginning concrete placement.

C.2.8.8 Safety

Do not permit any worker to enter the drilled shaft excavation for any reason unless a suitable casing has been installed, the water level has been lowered and stabilized below the level to be occupied, and an adequate safety equipment and procedures have been provided to the personnel entering the excavation, which includes OSHA certification for confined-entry-space.

C.2.8.9 Test Core

Once the excavation is completed to the required minimum shaft embedment, the drilled shaft shall be cleaned of any mud, loose soils and rock. The shaft bottom should be level and contain no protuberance of rock into the limits of the shaft. Collect a test core of the rock (beginning of the drilled shaft base level) with a core diameter of not less than 2.125-inches (NQ core) and core length of not less than 10 feet and in accordance to ASTM D2113.

The Project Engineer will verify that this rock core has a recovery of at least 50 percent throughout the length cored. If the core does not meet the above requirements, the core shall be extended as directed by the Project Engineer. Subsequently, drilled shaft embedment shall be extended to the Project Engineer directed level. If the rock core drilling is performed prior to excavation of the drilled shaft begin the core when rock is first encountered, then extended the core to the necessary depths that meets the recovery requirements outlined above or as directed by the Project Engineer. Prepare and submit the logs documenting any subsurface investigation borings or rock core holes performed at the drilled shaft foundation locations. Store the collected rock core samples in a wood framed core box.

After the shaft bearing level is established by the Project Engineer, immediately grout the test core hole.

C.2.8.10 Record Information

Provide the Project Engineer with all of the drilled shaft excavation records and report any unusual observation to the Project Engineer within eight hours of discovery. Submit a draft of this form for each completed drilled shaft within 24 hours of shaft completion, and submit the final form within two weeks. Submit relevant information on a daily basis, or more frequently when variation occurs, or as otherwise required by the Project Engineer.

Report the drilled shaft construction progress conforming to "Records and Forms" Drilled Shafts: Publication No. FHWA GEC 10, Section 19.5 and Appendix F, pages F-1 through F-16.

C.2.9 Placement of Reinforcing Steel Cage

Prior to placement of the reinforcing steel and concrete, if slurry fluid was employed during the installation of the drilled shaft, test the slurry for conformance to this specification as described in the QMP, Drilled Shafts special provision. Perform Slurry Tests along the shaft and a minimum of once at the bottom of the shaft. Adjust the slurry properties as necessary to meet the specifications.

Prior to placement of the reinforcement steel and concrete, ensure that C.2.8.7 cleanliness requirements are met.

Use concrete spacers or non-corrosive spacers at sufficient intervals not exceeding 10 feet along the reinforcement cage. Space a minimum of three spacers evenly around the circumference of any shaft with a maximum space along the shaft circumference of 30 inches between any spacer, i.e., at any given level then a 5 foot diameter shaft shall have 5 spacers. Place the first spacers 1.5 feet from the bottom of the shaft with successive spacer intervals every 10 feet, maximum along the shaft. Spacers shall be of an appropriate diameter wheel to eliminate gaps between the shaft excavation walls and the steel reinforcement.

C.2.10 Concrete Placement

C.2.10.1 General

Test the concrete delivered to the job site for conformance to the QMP Drill Shafts special provision, the standard specifications and this special provision. Maintain the same concrete placement operation from the beginning to the ending of the concrete placement for each shaft.

C.2.10.2 Concrete Placement Time

Place concrete within 48 hours of completing the drilling operation for each shaft. Any variance greater than this completion time requires approval from the Project Engineer.
Begin placing concrete within six hours after excavation inspection and approval unless otherwise directed by the Project Engineer. If the concrete is not placed within this time frame, the hole must be re-inspected and accepted by the Project Engineer prior to concrete placement.

The elapsed time for concrete placement shall not exceed the time limit defined in the approved drilled shaft installation plan and demonstrated by a successful technique shaft or test shaft. For wet placement methods, the concrete placement time shall commence at the mixing of the concrete and extend through to the completion of placement of the concrete in the drilled shaft excavation, including removal of any temporary casing. Prior to concrete placement, the Contractor shall provide test results of both a trial mix and a slump loss test conducted by an approved testing laboratory using approved methods to demonstrate that the concrete meets this defined placement time limit. The concrete mix shall maintain a slump of not less than the minimum value specified in QMP Drilled Shafts over the defined placement time limit as demonstrated by trial mix and slump loss tests. The trial mix and slump loss tests shall be conducted at ambient temperatures appropriate for site conditions. Ambient air temperature at the time of concrete trial tests and slump loss tests.

C.2.10.3 Concrete Placement by Free Fall

The contractor can place concrete by the free fall method, where the installation of drilled shafts is done by the dry method or the cased method if the seepage criteria is met. Allow concrete to fall a maximum of 60 feet. Do not allow under any circumstance the concrete to strike the rebar cage, steel core, or the sides of the excavation. Direct the concrete to the center of the cage or guide walls using a drop chute or similar device.

C.2.10.4 Concrete Placement by Tremie Pipes

Use tremie pipes to place the concrete inside the excavation under the following conditions:

- a. Where the excavation is filled with a drilling fluid such as water or slurry;
- b. Where the drilled shaft is installed on a batter; or
- c. Where a dry excavation may collapse under the shock of the waves of the free falling concrete.

Always keep the discharge end of the tremie a minimum of 7 feet below the level of the fresh concrete already placed inside the excavation to maintain a seal. The concrete should flow into position by pressure through a tremie with a minimum diameter of ten inches. Seal the bottom of the tremie before lowering it into the wet excavation. If water/slurry enters the tremie pipe after concrete pouring has started, withdraw the tremie and clean, reseal, and restart the pouring. Seal the bottom of the tremie to prevent flow into the tremie. If for some reason, the tremie is raised out of the fluid concrete or the concrete inside the drilled shaft drops down contaminating the tremie, then completely remove and clean the tremie, then replace the seal at the bottom of the tremie, and lower the tremie back as far below as possible into the already placed concrete.

C.2.10.5 Concrete Placement by Concrete Pumps

Concrete pumps and concrete lines can be used to place concrete in drilled shafts rapidly. Concrete pumps are used to place concrete in shaft excavations filled with water or slurry, to pour large or deep-drilled shafts, or to deliver the concrete from a distant location.

All pump lines and connections shall be watertight and shall guide the concrete to the discharge point at the center of the rebar cage or steel core and drilled shaft excavation. The pump line can be flexible; however, its portion at the end of the line and inside the excavation must be made of rigid and heavy steel so that it will stay straight during concreting. Keep the bottom of the pump line or discharge orifice 7 feet below the surface of fluid concrete already placed to avoid sudden jumping of the pump line out of the excavation. Continue placing concrete until over pouring is evident at the top of the drilled shaft and until dark gray concrete (acceptable concrete) can be distinguished from the drilling fluid.

C.2.10.6 Casting Level

The contractor shall place concrete until a minimum of 18 inches of concrete, measured vertically, has been expelled to eliminate contaminates in the top of the shaft pour and ensure that all concrete at and below the top of the drilled shaft is homogeneous and free of laitance and deleterious matter.

C.2.10.7 Water Retention

Repair any cracks, joints, defects of shaft where on exposure of the structure foundation, visible running water leaks are found that would result in leakage of the foundation.

C.2.11 Construction Tolerances for Individual Shafts

Completed drilled foundation shafts constructed out of the tolerance are unacceptable. The contractor is responsible for correcting to the satisfaction of the Project Engineer all unacceptable work. Materials, construction, work, engineering analysis, and redesign necessary to complete corrections to out-of-tolerance excavations or completed drilled shafts shall be furnished to the Owner without either cost or time extension for the project. Comply with the following construction tolerances:

- a) The final, as constructed position of the center of the drilled shaft shall be within a maximum of 6 inches in any direction from the theoretical position shown on the plans, unless otherwise permitted by the Project Engineer prior to construction.
- b) Drilled shafts shall be within 1.5 percent of plumb. Plumbness shall be measured from the top of the poured drilled shaft elevation or mudline, whichever is lower. During drilling or excavation of the drilled shaft, the contractor shall make frequent checks on the plumbness, alignment and dimensions of the drilled shaft. Any deviation exceeding the allowable tolerances shall be corrected with a procedure approved by the Project Engineer.
- c) When a permanent casing is used, the diameter of the installed drilled shaft shall not be less than the diameter of the drilled shaft shown in the plans. Any conflicts due to a casing that is greater in diameter than the plan-shaft diameter shall be remedied by the contractor. No additional compensation or schedule time shall be granted to the contractor for resolving any conflicts due to oversized casings. Employ equipment and methods of excavation to complete the drilled shaft excavation to a planar bottom, and the cutting edges of the equipment used during the excavation shall be normal to equipment's vertical axis within a tolerance of 3/8-inch per foot. The bottom of the drilled shaft excavation shall be normal to the axis of the drilled shaft within 3/4-inch per foot.
- d) Tolerances outlined in sections a through c herein shall be checked and finally met by the contractor prior to placement of the reinforced rebar cage inside the shaft hole.
- e) After the concrete is poured, the top elevation of the built drilled foundation shaft shall be within 1 inch of the top elevation of the corresponding drilled foundation shaft on the plans, and the top of the reinforcing steel cage shall be no more than 6 inches above or no more than 3 inches below the location of the cage shown on the plans. The center of the reinforcing cage shall be within 2 inches of the center of the drilled shaft at the bottom and within 4.5 inches of the center of the drilled shaft at the top.

C.2.12 Non-Destructive Testing Program

C.2.12.1 General

The contractor shall engage an independent consulting firm to perform both the Pile Integrity Tester (PIT) testing and the Crosshole Sonic Logging (CSL) testing for the Owner. The independent consulting firm shall have a minimum of 3 years of experience in performing both PIT and CSL testing of drilled shafts. The individual employee of the independent consulting firm performing, analyzing and preparing the report shall be a Wisconsin Licensed Professional Engineer and have experience on a minimum of 5 projects performing both PIT and CSL testing of drilled shafts. The contractor shall provide the Project Engineer of the independent consulting firm's and the individual employee's references prior to performing any testing of the drilled shafts. If the Project Engineer deems either the firm or individual does not meet the qualifications, then the contractor shall engage either an alternative firm or individual that the Project Engineer deems qualified to perform the testing of the drilled shafts.

C.2.12.2 Shaft Integrity Test (PIT)

The Pile Integrity Tester performs low strain integrity testing, alternatively called Sonic Testing, Pulse Echo, or Transient Response. The PIT can detect the presence and location of potentially dangerous defects such as cracks, necking, soil inclusions or voids and can determine shaft length. The equipment and technique are well established, conforming to ASTM D5882.

Prior to beginning the PIT test, assure that the concrete top is accessible and cleaned.

The independent consulting firm will perform the PIT test(s). Their engineer will evaluate and analyze the PIT test results and provide a written report summarizing the results of the test(s) within 5 business days and provide the Project Engineer a response regarding the acceptability of the drilled shaft tested.

The test will be conducted on shafts that at are at least five days old so that the concrete has attained minimum compressive strength necessary to perform the test.

C.2.12.3 Crosshole Sonic Logging Test

C.2.12.3.1 General

Crosshole Sonic Logging (CSL) is a nondestructive testing (NDT) method that measures the time for an ultrasonic pulse to travel from a signal source inside an access tube to a receiver inside another access tube and evaluates the integrity of drilled shafts.

Install access tubes intended for CSL testing.

Prior to beginning the CSL test, the contractor shall ensure that the test probes can pass through and down the tubes to the bottom of every installed tube. If a tube is obstructed, at no additional cost to the Owner, core a hole within the drilled shaft and near the obstructed tube to the depth as directed by the Project Engineer. The core shall be large enough to accommodate the probe through its full length.

The independent consulting firm will perform the CLS test(s). Their engineer will evaluate and analyze the CLS test results and provide a written report summarizing the results of the test(s) within 5 business days and provide the Project Engineer a response regarding the acceptability of the drilled shaft tested.

The CLS test(s) are to be performed conforming to ASTM D6760.

All CSL testing must be completed within thirty calendar days of concrete placement.

C.2.12.3.2 Installation Requirements

Drilled shafts must be fitted with CSL test tubes to evaluate their integrity as shown on the plans or as designated by the Project Engineer.

Install the access tubes or pipes as nearly parallel and far as possible from the longitudinal bars. The number of tubes to be installed per each drilled shaft diameter is as indicated in the table below:

Drilled Shaft Diameter Number of CSL Tubes Tube Spacing (a)

108 Inch

8 minimum 45 degrees

(a) Spacing based on a central angle in degrees.

Securely attach the tubes to the interior of the reinforcement cage with a minimum concrete cover of 3 inches, and they shall be wire-tied to the reinforcing cage every 5 feet so to secure the tubes in position during placement of the reinforcing steel cage. The tubes may be attached to exterior of the cage when accepted by the Project Engineer in which case the minimum cover requirement of three inches over the tubes shall be maintained. In all cases, the tubes shall be as near to vertical and parallel as possible.

The tubes shall extend from the bottom of the drilled shaft to at least 3 feet above the top of the drilled shaft, or 2 feet above the ground surface for shafts with cut-off below the ground surface. The tubes must be watertight and capped to prevent concrete or debris from entering during manipulation of the cage and concreting. Exercise care during lifting and lowering the steel reinforcement so as not to damage the tubes. Fill the CSL tubes with potable water prior to concrete placement. For production shafts and upon completion of the CSL tests, remove all the water from the access tubes or drilled holes and fill them up with an approved grout.

C.2.13 Acceptance for Constructed Drilled Foundation Shafts

C.2.13.1 General

The Project Engineer will reject any drilled foundation shafts that are not constructed and installed conforming to this special provision. Rejected shafts shall be replaced or rectified by the contractor and subject to the acceptance of the Project Engineer. This includes the removal and reinstallation of shafts and construction of additional compensation shafts, at no additional cost to the Owner.

C.2.13.2 Based on Specifications

The Project Engineer will only accept drilled shafts for structure foundations that conform to this special provision. Drilled shafts and related work construction disregarding any specified requirement will not be accepted including:

- a) Drilled shaft excavations constructed out-of-tolerance, as specified in this specification. When repair to an out-of-tolerance shaft is possible, as determined by the Project Engineer, fix the drilled shaft to meet the tolerances before proceeding further with any drilled shaft construction. All repairs must be acceptable to the Project Engineer before the drilled shaft work is resumed.
- b) Excavation of a drilled shaft with slurry not conforming to the QMP Drilled Shafts special provision.
- c) Drilled shafts exhibiting cuttings from slurry at the drilled shaft bottom showing soft, incomplete, or unclean bottoms; or presenting side sloughing and sedimentation at the bottom.
- d) Shafts with honeycomb intrusions or concrete in which the fines have been washed out or water channels in concrete are present.
- e) Horizontal discontinuity or severe necking in the drilled shaft concrete.
- f) Quarter-moon-shaped soil intrusions on the sides of a drilled shaft.
- g) Folded-in debris inside the drilled shaft.
- h) Drilled shafts for which the mix design has been altered without the acceptance of the Project Engineer, including adding of unauthorized water to a mix design to bring it to certain slump.
- i) Drilled shafts constructed in a manner where concrete placement has failed to meet the required time and tolerances, or the methods of installation did not have the Project Engineer's acceptance.
- j) Drilled shafts constructed with concrete not meeting the minimum 56-day compressive strength (3500 psi) requirement.

C.2.13.3 Based on the PIT or CSL Test

CSL and PIT test results will be evaluated by the Project Engineer. If the Project Engineer determines that CSL or PIT testing indicates significant anomalies or defects, the Project Engineer will direct the contractor to core the shaft(s) at the location(s) of the defect or anomaly. The coring shall be a minimum of NX-sized double tube core barrel. The Project Engineer will determine the number of cores, length(s), location(s), and testing methodology. If the coring or core sample testing results confirm the presence of significant anomalies or defects, the drilled shaft will be determined to be unacceptable and rejected by the Project Engineer. Upon rejection of the shaft(s), submit a remedial action plan to the Project Engineer for correcting the rejected work. The remedial action plan shall include detailed shaft repair or replacement procedures if necessary and will be subject to acceptance by the Project Engineer. Any modifications to the drilled shaft, load transfer mechanisms, and elements affected by the proposed remedial actions will require calculations and working drawings, and shall be made and stamped by a Professional Engineer, registered in the state of Wisconsin.

In the event that the Project Engineer directs the contractor to core through the concrete and the coring and associated core sample tests confirm the presence of anomalies or defects; the cost of coring, hole closure, core sample tests, and all labor and materials to perform the accepted remedial actions shall be provided at no additional cost to the Owner and with no extension of the contract time originally granted.

In the event that the Project Engineer directs the contractor to core through the concrete and the core or core sample tests do not confirm the presence of anomalies or defects; the cost of the coring, hole closure, and associated testing shall be borne by the Owner.

Frequent defects as determined by the Project Engineer will result in a re-evaluation of the contractor's installation procedure and, depending on the frequency and type of defect, may direct the contractor to change or modify their procedure.

D Measurement

The Owner will measure the Drilled Shaft Foundations 108-Inch bid items by the linear foot acceptably completed, based on the plan quantity without measurement. Longer shafts, larger shaft diameters, additional excavation, and additional concrete placed beyond the limits of the plan dimensions will not be measured for payment unless authorized and agreed to in advance of placement by the Project Engineer.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.01	Drilled Shaft Foundation 108-Inch	LF

Payment for Drilled Shaft Foundation 108-Inch is full compensation for preparing all submittals, including the Drilled Shaft Installation Plan; furnishing, installing, and removing temporary casing; furnishing and installing permanent casing; placing and removing temporary working surfaces and/or templates; furnishing and using drilling fluids; furnishing documentation; removing all obstructions; removing concrete due to oversizing, blowouts or protrusions from the face of the shafts; drilling fluids; lifting and positioning reinforcement steel, including any required wheel type spacers, boots, internal bracing of the reinforcement steel cage, and any other temporary lifting supports; furnishing and placing the concrete for the drilled shafts to the dimensions and elevations as shown on the plans, including removal of over pour concrete; installing and closing the crosshole sonic logging tubes; engaging an independent consulting firm for the PIT and CSL drilled shaft testing; all costs associated with the PIT and CSL testing including analyzing and providing a written report summarizing the test results.

Reinforcement bars are measured and paid under the bid item Bar Steel Reinforcement HS Structures.

33. Piling Steel HP 16-Inch x 88 Lb., Item SPV.0090.02

A Description

This special provision describes the providing steel piles and driving piles.

B Materials

Submit a certified report of test or analysis as specified in Wisconsin Department of Transportation Standard Specifications Section 506.3.21 at or before pile delivery unless the Project Engineer directs or allows otherwise. Ensure that piles have marks tying them to a specific test report, or absent marks, certify that all material furnished is represented by a submitted test report. Provide marks or certifications for each piece of a pile fabricated from multiple pieces.

Provide steel pile material per the Wisconsin Department of Transportation Standard Specifications Section 550.2.1(2).

C Construction

Construct and install piles per the Wisconsin Department of Transportation Standard Specifications Section 550.3.

D Measurement

The Owner will measure Piling bid item by the linear foot acceptably completed, measured as the length of piling driven and left in place below the cutoff elevation.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.02	Piling Steel HP 16-Inch x 88 Lb.	LF

Payment for the Piling bid item is full compensation for providing piles; for driving piles; for cutting off piles; and for excavating material within the footing perimeter heaved up by pile driving operations.

34. Bridge Lighting, Item SPV.0105.01

A Description

This special provision describes providing complete "Bridge Lighting" in accordance with the pertinent provisions of the WisDOT Standard Specifications and as hereinafter provided.

B Materials

Materials shall be provided as called out in the Electrical portion of the Structural plans as well as called out in the Electrical plans and details. Shop drawings shall be submitted for all electrical materials necessary to complete the project for a complete and operable system. New permanent lighting will use downward-facing, full cut-off lens lights. Any modification to the light fixture materials from the plans must meet the rating of 0,0,0 (B,U,G or equivalent) standards and be deemed an equivalent fixture by the engineer.

C Construction

All Bridge Lighting work shall be performed in its entirety as a lump sum bid item per the directives in the Electrical portion of the Structural plans as well as the directives of the Electrical plans and details. The contractor shall be responsible for any lost, damaged or stolen materials up the point of delivery to the Village taking signed ownership of their pole assembly materials.

D Measurement

The Owner will measure Bridge Lighting as a lump sum unit, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.01	Bridge Lighting	Lump Sum

Payment for Bridge Lighting shall be considered full compensation for the completion of all work necessary to provide a complete and operable system per the contract documents. This shall include all labor, tools, equipment, and all associated materials and incidentals necessary to complete the installation.

35. Timber Transverse Deck, Item SPV.0165.01.

A Description

This special provision describes providing the design, detailing, fabrication, delivery, construction and erection of the timber transverse deck on the steel support beams in accordance to the lines, dimensions, elevations, and details as shown on the plans and provided in the contract. Conform to standard spec part 507 as modified in this special provision.

B Materials

B.1 Design Requirements

Structural design of the timber transverse deck shall be by a professional engineer registered in the State of Wisconsin and experienced in timber bridge design. The manufacturer shall be regularly engaged in the production of the specified product or item and be able to furnish independent records or references of competence and satisfaction of this fact upon the request of the Owner. Calculations shall verify species, size and grade of materials to be used in the manufacture of the timber transverse deck.

Design the bridge according to the most recent edition of the following specifications except as modified herein.

- 1. AASHTO LRFD Bridge Design Specifications, all current interims,
- 2. AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, 2nd Edition
- 3. Wisconsin Bridge Manual
- 4. American Wood Protection Association (AWPA) Standards, current edition
- 5. American Wood Council (AWC) National Design Specifications (NDS) for Wood Construction
- 6. American Institute for Timber Construction (AITC), Timber Construction Manual

B.1.1 Timber Dowel Laminated or Glulam Transverse Deck Superstructure

Timber deck superstructure shall be a prefabricated dowel laminated or glulam transverse timber deck panel system.

Decks shall be comprised of multiple panels. Individual panel dimensions, species, and grade of timber shall be determined by the manufacturer.

Individual panel width dimensions shall be determined by manufacturer.

Panel thickness shall be as shown in the plans.

Panel species and grade of timber shall be determined by manufacturer. The design and supply of materials for proper transverse deck panel connection to bridge steel beams shall be the responsibility of the manufacturer and must be shown on the shop drawings.

Each transverse deck panel span shall be designed to accommodate the following loads:

- Pedestrian Live Load of 90 pounds per square foot (psf) with no reduction
- Vehicle Live Load of an AASHTO H-13 Truck
- Asphalt wearing surface dead load of 35 psf
- Future wearing surface load of 25 psf

B.1.2 Timber Railing

Timber rail system shall be included as part of transverse deck panel system. The rail system shall prevent a sphere with a diameter of 6" from passing through. The rail system shall be designed to carry a minimum design load of 50 pounds per lineal foot (plf), transversely and vertically, acting simultaneously on each longitudinal member.

All rails shall be smooth and continuous in nature with no protrusions that may cause snagging or scrapping.

The wood used for the rail system shall be treated with a water-borne preservative or oil-borne preservative in light petroleum solvent. The preservative is to be determined by the manufacturer and shall be clearly labeled in the shop drawings.

The rail system height shall be a minimum of 4'-6" (54") measured from the top of the deck's asphalt wearing surface (2" min.) to the top of the top horizontal rail.

The connection of rail components shall be to the transverse deck panels. No connection of rail components to substructures will be permitted.

B.2 Plan Requirements and Submittals

Submit shop drawings and calculations to the engineer conforming to standard spec 105.2 for review and acceptance. The project engineer review does not relieve the contractor from responsibility for errors or omissions on shop drawings. Submit no later than 90 days after date of notification to proceed with the project and a minimum of 30 days prior to the date proposed to begin bridge element fabrication.

The plans and shop drawings shall be prepared on reproducible sheets 11 inch x 17 inch, including borders. Each sheet shall have a title block in the lower right corner. The title block shall include the WisDOT project identification number and structure number. Design calculations and notes shall be on 8-1/2 inch x 11 inch sheets, and shall contain the project identification number, name or designation of the wall, date of preparation, initials of designer and checker, and page number at the top of the page. All plans, shop drawings, and calculations shall be signed, sealed and dated by a professional engineer licensed in the State of Wisconsin.

In the submittal, include the following:

- 1. Basic design criteria shown on the design plans.
- 2. Complete detailed drawings of all structural connections, sizes of members, span lengths between bearing points, skews, walkway widths, height of handrails and safety rails, bearing assembly details, anchorage locations and details, design data, materials data, and dead and live load bearing reactions.
- 3. Engineer's certification. The plans shall be sealed, signed, and dated by a professional engineer registered in the State of Wisconsin.
- 4. One set of design calculations with independent checks, as well as a bridge rating file for future WisDOT use.

The project engineer will return shop drawings from this submittal, and any subsequent submittals, either indicating acceptance or marked with required revisions and/or corrections.

B.3 Structural Timber

Lumber and timber shall meet the requirements of AASHTO M168. Glue laminated timber shall be manufactured using wet use adhesives.

Knotholes and holes from causes other than knots shall be measured and limited as provided for knots. All visible pieces of lumber and timber having knots that are unsightly in appearance shall be rejected. Cluster knots and knots in groups are not permitted.

Only pieces consisting of sound wood free from any form of decay shall be accepted. No piece of exceptionally lightweight timber shall be accepted.

Lumber and timber shall conform to the dimensions specified for either rough or surfaced stock.

Lumber and timber to be graded as per NFPA National Design Specifications for Wood Construction. All timber shall be grade #1 Coastal Douglas Fir, Southern Pine, or Hem-Fir.

B.4 Preservative Treatment

Preservative treatment of lumber and timber shall be by the pressure process, and unless otherwise provided in the contract special provisions, be in accordance AWPA Standards and AASHTO Designation M 133.

Lumber and timber shall be treated with Copper Naphthenate in Type A Hydrocarbon Solvent in accordance with AWPA P-36 and HSA-14 with retentions to meet AWPA UC4C. Other preservatives will not be accepted.

Unless otherwise directed by the Engineer the material shall be graded prior to treatment. Material shall be accepted after treatment on the basis of its condition prior to treatment, on the basis of inspection of the treatment procedure substantiated by plant records, on the condition of the material after treatment and on absorption, penetration and visual inspection.

So far as practicable all adzing, boring, chamfering, framing, gaining, mortising, surfacing and general framing, etc., shall be done prior to treatment. If cut after treatment, coat cut surfaces according to AWPA M4.

All Douglas Fir and other species that are difficult to penetrate shall be incised prior to treatment.

B.5 Hardware

All hardware (machine bolts, carriage bolts, drift pins, lag screws, dowels, rods, nails, spikes, washers, connectors, etc.) shall conform to ASTM 307-97.

Unless a Dome Head Bolt or approved equal is used, all bolt heads or tightening nuts in contact with Structural Timber and lumber shall have a washer of sufficient thickness and bearing area to ensure a minimum deformation of the contacted surface when tightened to develop not more than the maximum allowable tensile stress of that bolt

Bolt heads or tightening nuts in contact with metal surfaces shall have a cut washer or approved equal placed between the bolt head or nut and the metal surface.

All hardware shall be hot-dipped galvanized in accordance with AASHTO M111-91.

B.6 Timber Certification

Solid sawn timber members shall conform to the requirements of the grading rules agency for the species, type, and grade specified in the plans or special provisions. Glued-Laminated members shall conform to the American Institute of Timber Construction 117-201 for the combination, species, use, and appearance as specified in the plans or special provisions. A Grading Agency Certification is required on all timber material.

B.7 Manufacture

All lumber and timber shall be straight, well sawed, sawed squared at ends and have opposite surfaces parallel unless otherwise required by the plans and specifications.

Transverse deck panels to be delivered to jobsite after being fully assembled at fabrication plant.

All plank for deck panels shall be precision end trimmed to length with 1/4" under length and 1/4" overlength tolerance permitted.

B.6 Falsework and Bracing

The engineer will not require the contractor to use new or unused materials in falsework or bracing.

Use timber in falsework and bracing of adequate strength and shape, suitable for the purpose intended. Use material that is in good condition, sound, and free from defects that might impair its strength.

Falsework or temporary bracing shall not require preservative treatment.

C Construction

C.1 Delivery and Erection

Deliver the bridge by truck to the location that is nearest to the site and accessible by road. The contractor is responsible for unloading the transverse deck panels from the trucks at the time of arrival.

The manufacturer shall notify the contractor in advance of the expected arrival time. Information regarding delays after the trucks depart the plant such as inclement weather, delays in permits, rerouting by public agencies, or other circumstances shall be passed on to the contractor as soon as possible.

The manufacturer shall provide an erection procedure to the contractor and shall advise the contractor of the actual lifting weights, attachment points, and all other information needed to install the deck panels. Unloading, splicing, bolting, and providing proper lifting equipment as well as all tools, equipment, labor, and miscellaneous items required to complete the work is the responsibility of the contractor. The procedure for field splices shall be given to the contractor by the manufacturer.

C.2 Workmanship

Ensure all exposed surfaces are free from deep or frequent hammer marks. Properly pre-drill holes for screws, nails, spikes, lags or bolts where necessary to avoid splitting of timber.

C.3 Handling

Lumber and timber shall be handled with sufficient care to avoid breaking through portions penetrated by treatment, and thereby exposing untreated wood. Chains, peavies, cant hooks, pickaroons, timber dogs, pike poles and other pointed tools that would burr, blemish, penetrate or permanently deform the contacted member shall not be used. Rope, rubber or fabric slings shall be used.

D Measurement

The Owner will measure Timber Transverse Deck by the square foot, acceptably completed.

E Payment

Payment will be based on the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0165.01	Timber Transverse Deck	SF

Payment is full compensation for designing, manufacturing, transporting, and erecting the timber transverse deck panels; furnishing spikes, bolts, anchor bolts and all incidental items required for the deck panels. The Project Engineer will pay separately for the asphaltic wearing surface on the deck.

36. QMP Drilled Shafts

A Description

A General

This special provision describes performing work conforming to standard spec 501, 502, 701, 710, and 715 (conform to QMP Concrete Structures) except as deleted or additionally stipulated herein. This specification applies to all drilled shaft concrete placed under the following bid item:

SPV.0090.01 Drilled Shaft Foundation 108-Inch

B Materials

B.1 Concrete Mix Physical Requirements

Use high compressive strength concrete for drilled shaft construction and relatively high cement content in the concrete mix with 590 to 675 pounds of cement per cubic yard. Additives or admixtures, when they are used, shall be clearly indicated. The concrete shall be a flowable, non-segregating concrete mix that does not exhibit rapid slump loss.

Unit Weight of Concrete, AASHTO T 121: Weight must be between 140 to 160 lb/ft3.

Fine and course aggregate shall conform to the requirements of standard spec 501.2.5 except as modified herein.

Fine aggregate shall conform to the following gradation requirements:

Percent Passing
(by weight)
100
90 - 100
45 – 85
5 – 30
0 - 10
0-3.5

Coarse aggregates shall conform to the following gradation requirements:

	Percent Passing
Sieve Size	(by weight)
1/2"	100
3/8"	85 - 100
No. 4	10 – 30
No. 8	0 – 10
No. 16	0 – 5
No. 200	0 – 1.5

Any chemical admixture(s) to be used, other than air-entraining agents or water reducers from the Wisconsin Department of Transportation approved list, must be approved in advance by the engineer and meet the requirements of AASHTO M 194, as documented by independent laboratory test reports.

The adjustment of dosage rates of concrete admixtures will be permitted without requiring a new mix design.

B.2 Slump

The trial mix design for drilled shaft concrete shall include a Slump Loss Graph, or Slump versus Time after Batching. The Slump Loss Graph of a proposed drilled shaft mix design shall illustrate the slump reducing slowly and still exceeding a 5-inch slump two hours after batching. Careful attention to concrete mix designs made with retarders must be exercised. Monitor slump to assure that all concrete placement is completed before any mix begins setting. Operations may need to be adjusted to reduce the number of shafts that are completed during a single pour event.

Adding water to a ready-mix truck is prohibited. In cases in which part of the water of the concrete mix is added at the batch plant and the remaining water is added at the job site, the amount of water to be added at the job site shall be stated on the mix design sheet carried by the ready-mix truck driver. Testing of concrete will then be conducted on the resulting mix, and further water cannot be added at any time to increase the mix slump or to bring the mix to a specific slump. If after all the water permitted in the mix design has been added and the slump is still out of these specifications, the contractor must reject the mix. Repair or replace drilled shafts of questionable concrete design mixes at no additional cost.

The following table presents the ranges for the slump.

	Slump Range in Inches				
	Concrete	Concrete	Concrete		
	Placed by	Placed by	Placed by		
	Free Falling	Tremie	Pump		
Dry Installati	ion Method				
Uncased or C	Cased Excavations		7 to 9	8 to 9½	7 to 9½
Wet Installation Method					
Uncased or C	Cased Excavations		N/A	8 to 9½	7 to 9½
B.3 Slurry					

B.3.1 General

Slurry shall be a stable suspension of mineral in potable water or polymer slurry. Maintain a stable suspension at all times. Bentonite slurry shall be mineral slurry of powdered Wyoming or Dakota bentonite, with density, viscosity, and pH as specified in the table below:

Property at 68°F Units	At the Time of Slurry Introduction into the Drilled Shaft	Before Concrete Placement in the Drilled Shaft	Test Method
Density in Fresh Water (lb/ft³) (a)	64 to 69	64 to 75	Density Balance
Viscosity (seconds per quart)	28 to 45	28 to 45	Marsh Funnel
рН	7 to 11	7 to 11	pH paper or meter
Sand Content (%) (b)	4 maximum	10 maximum	200 Sieve Retain

(a) At time of concreting, sand content shall not exceed 10 percent (by volume) at any point in the drilled shaft excavation; test for sand content as determined by the American Petroleum Institute.

(b) Bentonite slurry shall be disposed of offsite in an approved manner as accepted by the WisDNR.

The contractor may adjust the range of slurry properties when field trials and field tests show that modifications are necessary to bring the slurry to specifications.

Polymer slurry shall be a suspension of powdered polyacrylamide or vinyl polymer with the following characteristics:

Property at 68°F Units	At the Time of Slurry Introduction into the Drilled Shaft	Before Concrete Placement in the Drilled Shaft	Test Method
Density in Fresh Water (lb/ft³) (a)	63 or less	63 or less	Density Balance
Viscosity (seconds per quart)	50 minimum	50 minimum	Marsh Funnel
рН	8 to 11	8 to 11	pH paper or meter
Sand Content (%)	2 maximum	10 maximum	200 Sieve Retain

(a) At time of concreting, sand content shall not exceed 10 percent (by volume) at any point in the drilled shaft excavation; test for sand content as determined by the American Petroleum Institute.

Obtain slurry samples from the midpoint and bottom of each drilled shaft prior to the placement of the reinforcing steel. Correct the slurry as necessary to meet the specification requirements.

B.3.2 Tests

To ensure that the results are within the ranges stated in the table above, perform the following tests on the mineral slurry supplied to the drilled shaft excavation at different depths within the drilled shaft using a slurry sampler.

B.3.2.1 Wisconsin Method of Test for Density of Slurry (Mud Weight)

Density shall be measured at 68°F. This test is identical to ASTM D 4380 except that the mineral slurry to be tested shall consist of processed attapulgite or bentonite clays, and the temperature of the slurry (using a 0-105°C thermometer) shall be measured and recorded on the drilling Mud Report form.

B.3.2.2 Wisconsin Method of Test for Viscosity of Slurry

The viscosity shall be measured at 68°F or a constant temperature with the Marsh Cone Method.

B.3.2.2.1 Scope

The Marsh Funnel or Marsh Cone is used to measure viscosity of drilling fluids. This test method has been adapted from Section 2 of the American Petroleum Institute (API) Recommended Practice FM8-RP13B-1: Standard Procedure for Field Testing Water-Based Drilling Fluids (FM 8-RP13B-1). Use of a direct-reading viscometer has been eliminated.

B.3.2.2.2 Equipment

Marsh Funnel: A Marsh Funnel is calibrated to out-flow 946 mL (one quart) of fresh water at a temperature of 21 \pm 3°C (70 \pm 5°F) in 26 \pm 0.5 seconds. A graduated cup is used as a receiver.

Specifications:	
Funnel Cone Length	305 mm (12.0 in.)
Diameter	152 mm (6.0 in.)
Capacity to bottom of screen	1500 mL
Orifice Length	50.8 mm (2.0 in.)
Inside Diameter	4.7mm (3/16 in.)
Screen	12 mesh

Has 1.6 mm (1/16 in.) openings and is fixed at a level 19.0 mm (3/4 in.)

B.3.2.3 Wisconsin Method of Test for Sand Content of Slurry

B.3.2.3.1 Scope

The sand content of mud is the volume percent of particles larger than 74 microns. It is measured by a sand-screen set. This test method has been adapted from Section 5 of the American Petroleum Institute (API) Recommended Practice 13B-1: standard Procedure for Field Testing Water-Based Drilling Fluids (RP13B-1).

B.3.2.3.2 Equipment

200-mesh sieve, 63.5 mm (2.5 in.) in diameter.

Funnel to fit sieve.

Glass measuring tube marked for the volume of mud to be added. The tube is graduated from 0 to 20 percent in order to read directly the percentage of sand.

B.3.2.3.3 Procedure

Fill the glass measuring tube with mud to the "mud" mark. Add water to the next mark. Close the mouth of the tube and shake vigorously. Pour the mixture onto the clean, wet screen. Discard the liquid passing though the screen. Add more water to the tube, shake, and again pour onto the screen. Repeat until the tube is clean. Wash the sand retained on the screen to free it of any remaining mud.

Put the funnel upside down over the top of the sieve invert. Slowly tip the assembly and insert the tip of the funnel into the mouth of the glass tube. Wash the sand into the tube by playing a fine spray of water

through the screen. Allow the sand to settle. From the graduations on the tube, read the volume percent of the sand.

Report the sand content of the mud by percent volume. Report the source of the mud sample, i.e. above shaker, suction pit, etc. Coarse solids other than sand will be retained on the screen (e.g., lost circulation material) and the presence of such solids should be noted.

B.3.2.4 Wisconsin Method of Test for pH of Slurry

pH shall be measured by the Electric pH meter or pH indicator paper strips.

B.3.2.4.1 Scope

Field measurement of drilling fluid (or filtrate) pH and adjustments to the pH are fundamental to drilling fluid control. This test method has been adapted from Section 7 of the American Petroleum Institute (API) Recommended Practice 13B-1: Standard Procedure for Field Testing Water-Based Drilling Fluids (RP 13B-1).

The recommended method for pH measurement of drilling fluid is with a glass electrode pH meter. This method is accurate and gives reliable pH values, being free of interference if a high quality electrode system is used with a properly designed instrument. Rugged pH instruments are available that automatically temperature compensate the slope and are preferred over the manually adjusted instruments.

NOTE: Color matching pH paper and sticks are used for field pH measurements, but are not the methods recommended. These methods are reliable only in very simple water muds. Mud solids, dissolved salts and chemicals, and dark-colored liquids cause serious errors in pH paper values. Readability is normally about 0.5 pH unit.

B.3.2.4.2 Equipment

pH meter: millivolt range potentiometer calibrated to show pH units for measuring the potential between a glass-membrane electrode and a standard "reference" electrode. The instrument is (preferred) to be water, shock, and corrosion-resistant and portable. Specifications are:

pH range: 0 to 14.

Electronics type: solid state (preferred).

Power source: batteries (preferred).

Operating temperature range: 0-66°C (32-150°F).

Readout: digital (preferred).

Resolution: 0.1 pH unit.

Accuracy: ±0.1 pH unit.

Repeatability: 0.1 pH unit.

Adjustments.

"Temperature" compensation of electrode system.

"Slope" of electrode system (preferred).

"Calibration" setting of readout. (Instrument with the above internal temperature compensation is preferred.)

Electrode system: A combination system of a glass electrode for sensing H⁺ ions and a standard voltage reference electrode, constructed as a single electrode (preferred). Body of this probe should be constructed of durable material. A flat-end probe is preferred for better protection and easier cleaning of the electrode. Waterproof connection to the meter is recommended. Specifications are:

Glass pH electrode response range: 0 to 14 pH unit.

Electrodes: a glass electrode and a silver/silver chloride electrode in combination, having a ceramic or a plastic single or double junction.

Electrolyte in reference electrode: KCl gel.

Glass composition: suitable for low sodium ion error.

Sodium ion error: at pH = 13 or at 0.1 mole Na⁺ ion, an error less than 0.1 pH unit.

Buffer solutions: three solutions to calibrate and set slope of pH meter prior to sample measurement.

pH = 4.0: potassium hydrogen phthalate at 0.05 molar in water. Gives 4.01 pH at 24°C (75°F).

pH = 7.0: potassium dihydrogen phosphate at 0.02066 molar and disodium hydrogen phosphate at 0.02934 molar in water. Gives 7.00 pH at 24°C ($75^{\circ}F$).

pH = 10.0: sodium carbonate at 0.025 molar and sodium bicarbonate at 0.025 molar in water. Gives 10.01 pH at 24°C (75°F).

NOTE: Buffers may be obtained from supply houses as pre-made solution, dry-powder packages, or a given formula, but must duplicate National Bureau of Standards primary or secondary buffers. Shelf life of all buffers not to exceed six months. Date of preparation of buffer should be shown on bottles used in the field. Bottles should be kept tightly stoppered.

Distilled or deionized water: in spray bottle.

Soft tissues: to blot electrodes.

Thermometer: glass, 0-150°C (32-220°F).

Accessory equipment: Soft-bristle test tube brush: to clean electrode.

Mild liquid detergent: Ivory, or equivalent.

Electrode storage vial: to keep electrode moist.

Sodium hydroxide: 0.1 molar (approximately); to recondition electrode.

Hydrochloric acid: 0.1 molar (approximately); to recondition electrode.

Ammonium bifluoride: 10% solution (approximately); to recondition electrode.

CAUTION: This is a strong and toxic acid.

Hydrofluoric acid: ACS reagent grade.

CAUTION: This is a strong acid.

B.3.2.4.3 Procedure – pH Measurement

Obtain sample of fluid to be tested. Allow it to reach 24 ± 3 °C (75 ± 5 °F). Allow buffer solution to also reach the same temperature as the fluid to be tested.

NOTE: For accurate pH measurement; the test fluid, buffer solution, and reference electrode must all be at the sample temperature. The pH of the buffer solution indicated on the container label is the correct pH only at 24°C (75°F). If attempting to calibrate at another temperature, the actual pH of the buffer at this temperature must be used. Tables of buffer pH values at various temperatures are available from the suppliers and should be used in the calibration procedure.

Clean electrodes by washing with distilled water and blot dry. Place probe into pH 7.0 buffer.

Turn on meter; wait 60 seconds for reading to stabilize. Measure temperature of pH 7 buffer solution. Set this temperature on "temperature" knob. Set meter reading to "7.0" using "calibration" knob. Rinse probe with distilled water and blot dry.

Repeat operations using either pH 4.0 or pH 10.0 buffer. Use pH 4.0 if "acidic" sample, or pH 10.0 if "alkaline" sample is to be tested. Set meter to number "4.0" or "10.0" respectively, using "slope" adjustment knob. (If no "slope" knob exists, use the "temperature" knob to set "4.0" or "10.0" on meter). Check the meter with pH 7 buffer again. If it has changed, reset to "7.0" with "calibration" knob. Repeat procedures to ensure equipment is properly calibrated.

NOTE: Discard and do not reuse the sample of buffer solutions used in calibration. Meter should be fully calibrated every day using two buffers. Check with pH 7 buffer every three hours. If meter calibrates properly, rinse electrode with distilled water and blot dry. Place electrode in sample to be tested and stir gently. Allow 60 to 90 seconds for reading to stabilize.

Record sample pH to nearest 0.1 pH unit and the temperature of sample tested. Carefully clean the electrode in preparation for next usage. Store in vial of pH 4 buffer. NEVER let the probe tip become dry. Turn meter off and close cover to protect instrument. Avoid storing instrument at extreme temperatures (below 0°C (32°F) or above 49°C (120°F)).

Care of Electrode: Cleaning the electrode will be necessary periodically, especially if oil or clay particles coat the face of the glass electrode or the porous frit of the reference electrode. Clean electrode with a soft-bristle brush and a mild detergent. Reconditioning the electrode may be necessary if plugging becomes sever, as indicated by slow response, drifting of readings, or if "slope" and "calibration" cannot be mutually set. Recondition by soaking electrode for 10 minutes in 0.1 M HCl followed by rinsing in water and soaking for 10 minutes in 0.1 M NaOH and rinsing again. Check electrode for response by performing calibration. If electrode continues to perform poorly, soak electrode for two minutes only in 10% NH₄F · HF solution. (CAUTION: This is strong and toxic acid). Replace electrode system if above steps fail to recondition it.

C (Vacant)

D (Vacant)

E Payment

E.1 QMP Drilled Shafts

Costs for all sampling, testing, and documentation required under this special provision and all other associated work are incidental to the work. If the contractor fails to perform the work required under this special provision, the contractor's pay may be reduced.

37. Polymer Overlay (Trail), SPV.0180.01

A Description

This special provision describes providing two layers of a two-component polymer overlay system to the concrete trail profile as the plans show.

B Materials

B.1 General

Furnish materials conforming to 509.5100.S specifically designed for use over concrete. Furnish polymer liquid binders from the department's approved product list conforming to the Polymer Overlay for use on bridge decks.

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
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	<u>≥</u> 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	<u>≤</u> 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 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 engineer will sample and test the aggregates for gradation and moisture content before placement. If requested, supply the engineer 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: WisDOT #5852-00-75,78 Project #19234007

<u>Polymer Binder</u>: 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.

<u>Aggregates</u>: 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:

<u>Field Review:</u> Conduct a field review of the existing concrete trail section to identify any possible surface preparation and material compatibility issues.

<u>Pre-Installation Meeting</u>: 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).

<u>Manufacturer's Representative</u>: 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.

<u>Material Storage</u>: 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 Trail Preparation

C.2.1 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 trail profile 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, detectable warning fields, or other appurtenances on the trail profile 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.

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 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 a 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. Concrete surface temperature is below 50 F.
- 3. Moisture content in the concrete exceeds 4.5 percent when measured by an electronic moisture meter or shows visible moisture after 2 hours when measured in accordance with 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 age is less than 28 days.
- 7. The concrete surface 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 concrete trail has been shotblasted or during the overlay curing period, only necessary surface preparation and overlay application equipment will be allowed on the concrete trail. Provide appropriate protective measures to prevent contamination from equipment allowed on the concrete trail 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, detectable warning fields and approach pavement.

C.4 Application Rates

Apply the polymer overlay in two separate courses in accordance with 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 concrete trail, 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 Owner will measure Polymer Overlay by the square yard, acceptably completed.

E Payment

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

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0180.01	Polymer Overlay, Trail and Ramps	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.

38. Excavation, Hauling, and Disposal of Potential Creosote Contaminated Soil, SPV.0195.01

A Description

A.1 General

This special provision describes excavating, loading, hauling, and disposing of creosote contaminated soil at a DNR licensed landfill. The closest DNR licensed landfill is:

Landfill Name: WMWI – Madison Prairie (License #3318)

Location/Address: 6002 Nelson Rd, Sun Prairie, WI 53590-9714

Contact Information: Daniel Leclaire, dleclaire1@wm.com, (608) 837-9031

Perform this work according to standard spec 205 and with pertinent parts of Chapters NR 700-754 of the Wisconsin Administrative Code, as supplemented herein. Per NR 718.07, a solid waste collection and transportation service-operating license is required under NR 502.06 for each vehicle used to transport contaminated soil.

Perform this work according to standard spec 205, with pertinent parts of Chapters NR 100-299 of the Wisconsin Administrative Code, and as supplemented herein. Perform all work necessary to control, handle, and dispose of groundwater and surface water, and all other water that may be encountered within contaminated areas, as required for performance of the work.

A.2 Coordination

Coordinate work under this contract with the environmental consultant retained by the owner:

Consultant: MSA Professional Services, Inc.

Contact: Carrie Zulpo Address: 1702 Pankratz St, Madison, WI 53704 Phone: (608) 216-0269 E-mail: czulpo@msa.ps.com

The role of the environmental consultant will be limited to:

- Coordinating soil sample collection and laboratory testing for landfill acceptance.
- Determining the location and limits of contaminated soil to be excavated based on visual observations and field screening of soil that is excavated.
- Identifying contaminated soils to be hauled to the DNR licensed landfill.
- Documenting that activities associated with management of contaminated soil are in conformance with the contaminated soil management methods for this project as specified herein.
- Obtaining the necessary approvals for disposal of contaminated soil from the DNR licensed landfill.
- Identifying contaminated groundwater to be pumped for treatment and disposal (if dewatering is necessary). Coordinating groundwater characterization and approval for disposal of contaminated water.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all excavation activities in the areas of contamination to the environmental consultant. Also notify the environmental consultant at least three calendar days prior to commencement of excavation activities in each of the contaminated areas.

Identify the DNR licensed landfill that will be used for disposal of contaminated soils and provide this information to the environmental consultant no later than 30 calendar days prior to commencement of excavation activities in the contaminated areas or at the preconstruction conference, whichever comes first. The environmental consultant will be responsible for obtaining the necessary approvals for disposal of contaminated soils from the landfill.

Coordinate with the environmental consultant to ensure that the environmental consultant can be present during excavation activities in the contaminated areas. Perform excavation work in each of the contaminated areas on a continuous basis until excavation work is completed. Do not transport contaminated soil off-site without prior approval from the environmental consultant.

A.3 Health and Safety Requirements

Supplement standard spec 107.1 with the following:

During excavation activities, expect to encounter soil contaminated with creosote or other petroleum related products. Site workers taking part in activities that will result in the reasonable probability of exposure to safety and health hazards associated with hazardous materials shall have completed health and safety training that meets the Occupational Safety and Health Administration (OSHA) requirements

for Hazardous Waste Operations and Emergency Response (HAZWOPER), as provided in 29 CFR 1910.120.

Prepare a site-specific Health and Safety Plan, and develop, delineate and enforce the health and safety exclusion zones for each contaminated site location as required by 29 CFR 1910.120. Submit the site-specific health and safety plan and written documentation of up-to-date OSHA training to the engineer prior to the start of work.

Disposal of creosote-contaminated soil at the landfill facility is subject to the facility's safety policies.

B (Vacant)

C Construction

Supplement standard spec 205.3 with the following:

The environmental consultant will periodically examine excavated soil during excavations in the areas of soil contamination from creosote treated timbers within the construction limits.

Control operations in the contaminated areas to minimize the quantity of contaminated soil excavated and to ensure that excavations do not extend beyond the minimum required to construct utilities and highway improvements unless expressly directed to do so by the engineer.

Excavate the potentially contaminated soil within five feet of creosote-treated timbers. Stockpile the material within the project limits, pending laboratory results and landfill acceptance. Construct and maintain a temporary stockpile of the material according to NR 718.05(3), including, but not limited to, placement of the contaminated soil/fill material on an impervious surface and covering with impervious material to prevent infiltration of precipitation. Complete test pits near the creosote-treated timbers in lieu of stockpiling.

The environmental consultant will coordinate analytical testing of the contaminated soil for landfill acceptance. Allow up to 10 business days to conduct this testing and issue results. In the event the analytical test results do not indicate contamination is present, the stockpiled material may be considered common excavation and paid for under the Excavation for Structures Bridges B-56-258 and Excavation for Structures Retaining Walls R-13-405 and R-13-406.

The environmental consultant will periodically evaluate soil excavated from the contaminated areas to determine if the soil will require offsite disposal at a DNR licensed landfill or can be beneficially re-used on-site. The environmental consultant will evaluate excavated soil based on field screening results and visual observations. Assist the environmental consultant in collecting soil samples for evaluation using excavation equipment. The sampling frequency shall be a maximum of one sample for every 50 cubic yards excavated.

On the basis of the results of such field-screening, the material will be designated for disposal as follows:

- Excavation Common consisting of clean soil and/or clean construction and demolition fill (such as clean soil, boulders, concrete, reinforced concrete, bituminous pavement, bricks, building stone, and unpainted or untreated wood), which under NR 500.08 are exempt materials, or
- · Low-level contaminated material for reuse as fill within the construction limits, or
- Contaminated soil for off-site treatment and disposal at the DNR licensed landfill facility, or
- Potentially contaminated for temporary stockpiling and additional characterization prior to disposal.

Some material may require additional characterization prior to disposal. Provide for the temporary stockpiling of up to 50 cubic yards of contaminated soil on-site that requires additional characterization. Construct and maintain a temporary stockpile of the material according to NR 718.05(3), including, but not limited to, placement of the contaminated soil/fill material on an impervious surface and covering the stockpile with impervious material to prevent infiltration of precipitation. The owner's environmental consultant will collect representative samples of the stockpiled material, laboratory-analyze the samples, and advise the contractor, within 10 business days of the construction of the stockpile, of disposal requirements. The stockpiled material shall be disposed either at the DNR licensed disposal facility by the contractor or, if characterized as hazardous waste, by the department. As an alternative to temporarily stockpiling contaminated soil/fill material that requires additional characterization, the contractor has the option of suspending excavation in those areas where such soil is encountered until such time as characterization is completed.

Directly load and haul soils designated by the environmental consultant for off-site disposal to the DNR licensed landfill. Use loading and hauling practices that are appropriate to prevent any spills or releases of creosote contaminated soils or residues. Prior to transport, sufficiently dewater soils designated for off-site disposal so as not to contain free liquids. Verify that the vehicles used to transport contaminated material are licensed for such activity according to applicable state and federal regulations.

When material is encountered outside the above-identified limits of known contamination that appears to have been impacted with petroleum or chemical products, or when other obvious potentially contaminated materials are encountered or material exhibits characteristics of industrial-type wastes, such as fly ash, foundry sand, and cinders, or when underground storage tanks are encountered, suspend excavation in that area and notify the engineer and the environmental consultant.

Groundwater may be present within the construction limits. Water generated during dewatering operations (if necessary) is expected to be permitted to discharge to the surface except in the contaminated areas. If dewatering of perched groundwater or stormwater is required, allow stormwater to settle for 24 hours after a rain event, after which the water shall be managed as uncontaminated dewatering, unless the environmental consultant has evidence that the water will require treatment and/or off-site disposal.

Contaminated groundwater generated from dewatering activities within the contaminated areas may exceed the surface water discharge limits for petroleum compounds specified in the DNR's "General Permit to Discharge under the Wisconsin Pollutant Discharge Elimination System" for "Contaminated Groundwater from Remedial Action Operations" (WPDES Permit No. WI-0046566-5), Table 3.1.

Pump contaminated water that exceeds surface water discharge limits, as determined by the environmental consultant, into temporary holding tanks provided by others or an alternative discharge point as determined by the environmental consultant, as necessary to complete construction. Allow contaminated water encountered, but not requiring removal as a standard course of construction, to remain in-place and do not manage according to this special provision.

The environmental consultant will coordinate approval of contaminated water hauling and disposal. Only pump contaminated groundwater if the environmental consultant is on-site.

Discharging contaminated groundwater to any location other than that approved and provided by the environmental consultant, is at the contractor's cost. If the contractor chooses alternate discharge, at the contractor's cost, obtain DNR concurrence on any dewatering plans, and provide and operate any and all treatment and discharge equipment required.

Employ construction methods and techniques in a manner that will minimize the need for dewatering, and if dewatering is required, minimize the volume of water generated. Take measures to limit groundwater, surface water, and precipitation from entering and exiting excavations in the areas of contamination. Such measures, which may include berming, ditching, or other means, shall be maintained until construction of utilities in the areas of contamination are complete.

Ensure continuous dewatering and excavation safety at all times. Provide, operate, and maintain adequate pumping equipment and drainage and disposal facilities. Notify the engineer of any dewatering activities and obtain any permits necessary to discharge water. Provide copies of such permits to the engineer. Meet any requirements and pay any costs for obtaining and complying with such permit use. Follow all applicable legislative statutes, judiciary decisions, and regulations of the State of Wisconsin.

D Measurement

The owner will measure Excavation, Hauling, and Disposal of Potential Creosote Contaminated Soil in tons of contaminated soil accepted by the DNR licensed disposal facility as documented by weight tickets generated by the disposal facility.

E Payment

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

ITEM NUMBERDESCRIPTIONUNITSPV.0195.01Excavation, Hauling, and Disposal of Potential Creosote Contaminated SoilTON

Payment is full compensation for excavating, segregating, loading, hauling, and disposal of contaminated soil; tipping fees including applicable taxes and surcharges; obtaining solid waste collection and transportation service operating licenses; assisting in the collection of soil samples for field evaluation.





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