



## Bridge Technical Committee Meeting Minutes

**Date:** Tuesday, November 5, 2024

**Time:** 1:00 pm-3:30pm

**Location:** HF S149

### Introductions

**10 min**

In-Person Attendees: Laura Shadewald, Greg Brecka, James Luebke, Aaron Bonk, Josh Dietsche, Brent Freeman, David Stanke, Ann Thielmann, Dominique Bechle, Kyle Busch, Matt Grove, Dan Kowalski, Mike Delemont, Isaac Groshek, Joe Balice, Craig Pringle, Cherish Schwenn

Online Attendees: Gary Courneya, Andrea Breen, Bill Dreher, Brian Boothby, Julie Brooks, Carolyn Brugman, Carlos Villarreal, Chad Halverson, Phil Ciha, Thomas Conto, Eric Heitman, Hans Hallanger, Bill Hardy, Chad Hayes, Jared Marugg, Joe Larson, Steve Katzner, Linda Krueger, Leah Rhodes, Leslie Ashauer, Tirupan Mandal, Mark Mutziger, Mike Ryan, Dan Monroe, Dave Pantzlaff, Cami Peterson, Carla Principe, Kristin Revello, Jason Roselle, John Rublein, Scott Stroud, Julie Slota, Tadd Owens, Jonathan Thomas, Tim Borowski, Krissy VanHout, Craig Webster, Mark Zander

### Subcommittee Report(s)

**5 min**

**5 min      Design & Construction Subcommittee Update**

Aaron Bonk

No specific requests came in from the contracting community since the last BTC meeting. Subcommittee will remain in place on an as-needed basis. No current plan in place for a meeting of this group.

### Standing Topics

**20 min**

**10 min      Wisconsin Highway Research Program Bridge Items**

James Luebke

James discussed current research projects that are active/ongoing including MSE wall repairs, vertical and overhead patches, etc. There is a new research project coming out that is targeting scour design practices to assist with appropriate substructure type selection. Additionally, there is research coming forward to hone in on better quantification of estimated deck prep areas for use on rehabilitation projects for bridges.

**10 min      Bridge Manual Updates**

James Luebke

### Previous Meeting Carryover Topics/Action Item(s) Review

**25 min**

**10 min      False Decking**

Aaron Bonk

Aaron discussed the internal, WisDOT discussions that have taken place since the last BTC meeting related to this topic. Multiple meetings have been had and an intended direction has been drafted for consideration amongst the statewide project development chiefs. On Wednesday, 11/13, the statewide chiefs will be meeting and this discussion will be had with the



intention of finalizing the recommended direction prior to bringing it back to the contractors group.

As of right now, the intent is to use standardized contract language in the form of a "Notice to Contractor, Containment System." Draft language can be seen below, and it will be included in the contract for a specific set of bridge conditions, which are also outlined below.

**Proposed contract language:**

**Notice to Contractor, Containment System.**

Provide a rigid containment system throughout bridge construction over live traffic lanes and pedestrian facilities capable of protecting underlying facilities and vehicles from falling construction debris. Design the containment system to catch construction debris between exterior girders. The containment system is not intended to be a secondary falsework/formwork system. Put the containment system in place before beginning construction operations that may generate debris. Operations may include, but are not limited to: full or partial deck removals, falsework installation, deck repairs, and deck pours. This containment system is not required if construction operations are performed when the facilities below are under full closure. This containment system does not replace any requirements under standard specifications section 203.

Include details of the proposed containment system in the falsework submittal per standard specifications section 502.3.2. The containment system is incidental to the bridge construction items.

**Proposed criteria for inclusion in a contract:**

Insert article where work operations between the exterior girders of a bridge are anticipated to be performed over live traffic lanes and pedestrian facilities, and the operations have a risk of falling construction debris (i.e., nails, construction tools, various wood products, concrete/deck repair debris, fresh concrete, etc.) onto the facilities below. This article is not needed if the contract requires all bridge construction to be performed when the facilities under the bridge are fully closed.

- All bridges over interstate highways with live traffic below.
- All bridges over roadways with a minimum ADT of 10,000 with live traffic below.
- All bridges over pedestrian facilities that will remain open during construction.

**\*\*Note that these criteria are the minimum application locations.**

Regions may determine other suitable locations where Containment System language will be included in the contractor for project-specific reasons.

Dan Kowalski asked whether the situation where utilities are hung under the bridge were considered in the development of the draft language. Aaron responded that we are open to adding designer notes to clarify that



different situations may require different approaches, and that our intention is to try to handle this on the design side of things to avoid issues in the field. Mike Delemont asked about how this affects the standard spec Debris Containment bid item and Aaron indicated that the intention is to leave that bid item be.

**Action Item(s):** Aaron Bonk will bring back the final, proposed language to the contractor group that was originally involved in the discussions on this topic for their review and comment. The intention would be to have finalized design guidance in place prior to the end of the year if possible.

5 min

#### **Piling Overages with and without Preboring Measurement**

Laura Shadewald

This topic was discussed at the Fall 2023 Bridge Technical Committee meeting and has carryover action items. Laura Shadewald and David Staab spoke with Jake Gregerson to better understand the issue for one particular project. It appears that spec interpretation played a role in the concern, however plan note quality also played a role. Laura is working with the BOS Development Section to get a standard plan note template established and documented for use by in-house design staff and consultant designers for preboring applications. Information about preboring will also be presented at Region Construction Conferences this winter, and discussed in Construction Inspection training as well.

5 min

#### **Project Schedule Issues**

Aaron Bonk

Aaron provided insights into BOS's review of project schedules with those from the Regions who have been in charge of setting schedules. We have received some preliminary information from the Regions, but similar to the False Decking discussion above, a more formal discussion will be held with the statewide project development chiefs at a meeting on Wednesday, 11/13. Aaron indicated that this is likely to be a larger task to develop detailed enough language and guidance for the Regions to use to reduce or eliminate construction schedule issues. Aaron also stated that he'd be reaching out to other state DOT's to gain an understanding of how they assemble construction schedules for projects, as the early information provided by the WisDOT Regions indicates that the level of detail is fairly small when setting up our construction project schedules currently. David Stanke indicated that material procurement is another issue that needs to be addressed and included in this review. He also indicated that there seems to be a shift to using more HPC in different elements of bridges and structures, and the cure times absolutely need to be reviewed and included in the schedules as they don't appear to be now. Mike Delemont asked about whether some type of allotment for "float time" should be included in our contract schedules, and this can be considered moving forward.

**Action Item(s):** BOS will bring back information from the statewide chiefs group to the BTC for consideration. Additionally, potential/likely updates to guidance for the Regions on how they schedule their projects will be developed with the intention being to have updated guidance as soon as possible.



5 min	<b>Box Culvert Joints</b> <p>James discussed the research that he has done into this topic since it was brought forward at the last BTC meeting. He indicated that the policy requiring the joints in construction has been in place for multiple decades. James discussed the design of 'typical' WisDOT box culverts counts on those joints, so eliminating them isn't always acceptable or feasible. There may be situations where the subgrade is very consistent from one end of the box to the other, or other conditions are present that may allow a continuous pour but in general there won't be a move to allowing full length pours for all projects.</p> <p>Chad Halverson asked the question about utilizing saw cuts for these joints and James indicated that WisDOT hasn't seen good success with sawcut joints so we would not be allowing them.</p>	James Luebke
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## New Topics

70 min

10 min	<b>E-Ticketing</b> <p>Brian Boothby discussed the fact that there are upcoming pilot projects for 2025 similar to what was done in 2024. He also indicated that BTS/BPD/OWIB have been working on thresholds for 2025 projects. One of specific note was that 1300 CY of concrete was a threshold for use of e-ticketing. There was no discussion related to this specific item coming from the contractors in attendance.</p>	Brian Boothby
10 min	<b>IRI Ride Roadway Spec Application to Bridges</b> <p>Dan discussed the fact that different bridge projects have either paid or not paid for the profiling, so they'd prefer to have some level of consistency in how this is applied. Laura asked the question about whether this is being called for on a widespread basis, because when the IRI ride spec was created it went to a pilot but was not intended for full implementation on bridges. Dan indicated that it has been in contracts through the roadway side of things, and they are being asked to grind/profile decks and sometimes at their cost.</p> <p><b>Action Item(s):</b> Laura will review this issue and discuss how things are being applied statewide to determine what updates need to be made, if any, in order to apply (or not apply) things as intended.</p>	Dan Kowalski
10 min	<b>Girder Deflection/Rebound on Redecks</b> <p>Dan discussed recent projects, specifically on steel girder projects but also for some prestressed girders, that the girders are not rebounding as expected. He also indicated that for staged construction projects, the impacts seem to be even more of an issue. It is the thought that this isn't a new issue, but has been present for an extended period of time, but that we are possibly pushing the limits on redecks (changing overhang lengths, changes to deck thicknesses/cross slopes, etc.) that are causing things to be more pronounced. Considerations also need to</p>	Dan Kowalski



be made for situations where the original construction may have included a larger thickness of deck than originally called for, which could impact the ability of the existing girders to rebound. David Stanke indicated that there was a project that Ayres designed on the east side of Madison where there was a plan sheet that called for surveys before the deck was removed and also after it was removed to confirm rebound, prior to pouring. And in this case, there were adjustments that were able to be made.

**Action Item(s):** BOS will review this issue and will determine what types of design process modifications should be made to be able to allow flexibility in the field to adjust to actual rebounds seen vs. those assumptions made in design.

10 min

**Deck Slab Joint Locations Relative to Girder Flanges on Deck  
Widenings**

Dan Kowalski

Dan brought forward the recommendation to move removal joint locations as close to existing girder flanges as possible to minimize the flex in the deck to ultimately minimize the spalling on the underside of the deck. In the event that spalling does occur, Dan indicated that different projects approach the repairs differently and what is or is not acceptable to remain. Aaron Bonk asked the contractors for options for removals that would be more amenable to providing a consistent edge of removal location (i.e., reduction of the spalling issue), but there were no options immediately that came forward in the discussion. There was some discussion about how using smaller equipment / hand removals would likely help minimize the underside spalling issue, but not likely able to eliminate it, and it would come with schedule impacts. The contractors are asking for some type of table of what types of repairs are acceptable depending on the level of damage/deterioration that happens, as it is almost inevitable that spalling will occur with this removal type.

**Action Item(s):** BOS will continue to assess this situation internally and will see if different types of pilots can be done to try to improve the situation.

10 min

**Approved Product List (APL) process – Rapid Patch Material & Non-Shrink Grout**

Tirupan Mandal

WisDOT has been working on updating the process of how materials are placed on the different APL's. The intention is to include language on what requirements are required in order for materials to be submitted and accepted for placement on the lists. Tirupan provided background on this work that the Bureau of Technical Services has been leading.

**Action Item(s):** Tirupan will send updated spec language to be included in these meeting minutes for review and comment by the BTC members. Comments should be returned to Tirupan by the end of the year in order for him to compile and finalize for the next spec book update/publishing in early 2025.



10 min

### Construction Staking for Temporary Structures

Isaac Groshek

Isaac Groshek brought forward this topic and indicated that it would be helpful to have clarification on the 526.0101 Temporary Structure Item, specifically related to whether construction staking is incidental OR whether a separate Construction Staking for Temporary Structure items should be added for temporary structures where construction staking is critical. In practice, to have a separate construction staking item for temporary structures where vertical and horizontal layout is critical may be more helpful to contractors from Isaac's perspective, and Brent Freeman agreed. The 526 Temporary Structures spec section states to "Construct temporary structures conforming to 500" and "Payment for the Temporary Structure bid items is full compensation for providing a temporary structure including design and construction... All temporary shoring and other secondary *Structures items* required to construct the temporary bridge structure are to be included as a part of this bid item." *Structure items* could be interpreted as those falling under the 500 Structures spec category. Construction staking is a 650 item and is not required for many temporary structures where geometry control is not critical (i.e., temporary bridges for a temporary bypass over a small creek). From David Stanke's perspective, if the Department wants a temporary structure to be staked then the Department should have an item in the contract saying as much.

Craig Pringle indicated that there is a difference from the Department's standpoint between WisDOT asking for items vs. the contractors not coordinating amongst subs on what they'd like to have in place to perform their work.

**Action Item(s):** BOS and Craig Pringle/BPD to consider whether including the construction staking as incidental to the Temporary Structure bid item (and including this in the language of that spec) is beneficial to clarifying the issue at hand. Consideration needs to be given to whether the Department/construction staff will require construction staking on these structures.

10 min

### Cofferdam Unit/Payment

Isaac Groshek

Isaac brought up that it appears that there was a somewhat recent change of the 206.5001 Cofferdam bid item from a LS to EACH item. Several plans have had confusion whether the EACH applies on a structure-by-structure basis or a substructure-by-substructure basis. It is likely that the item is meant to be a LS item per structure and not substructure, but either way clarification is required for design and field staff. Laura provided clarification the current spec language is intended to be an EACH item per structure, and that the Bridge Manual design guidance will be updated accordingly with the next update in January 2025.

Additionally, Isaac asked for clarification in the specifications that Cofferdams are acceptable if they meet the language of standard spec



206.3.3(1), which includes the use of well-point systems in conjunction with excavations/earthen barriers, instead of sheet piling or a different steel or concrete enclosure. Laura Shadewald stated that the intention is that whatever means used to allow the contractor to pour the seal or footing in the dry should be viewed as a cofferdam and should be paid accordingly. David Stanke indicated that there was an older version of the spec that required a physical cofferdam and that this is possibly the source of confusion in the field.

Matt Grove also indicated that there are issues with field staff not paying for the full “Each” items (i.e., they are paying parts of the overall bid price in the event that certain locations don’t utilize cofferdams in the field).

**Action Item(s):** BOS and BPD to review the existing standard spec and CMM guidance related to cofferdams and identify options for clarifying the intent for payment, and what is acceptable in terms of the definition of a cofferdam.

**Future Topic: In-Stream Restrictions for Dry Runs**

Isaac Groshek

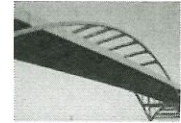
Isaac Groshek brought forward this topic for future discussion including WDNR staff.

**Future Topic: HPC Use on Structure Projects**

David Stanke

David Stanke brought forward the issue of considering the application/location of use of HPC on different projects around the state (IH 94 East/West contractor workshop, IH 94 over Wisconsin River bridges, etc.) It appears that HPC is garnering much more usage and is being applied in locations where supply is not prevalent or sometimes even available. In the Southeast Region, there are only two suppliers and only one that will provide concrete for nighttime pours.





## Bridge Technical Committee Meeting Sign-In Sheet

**Date:** Tuesday, November 5, 2024

**Time:** 1:00pm-3:00pm

**Location:** HF S149

Name	Company	Email
AARON BOOK	WISDOT BOS	AARON.BOOK@DOT.WI.GOV
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Cherish Schwenn	WRMCA	CSchwenn@wrmca.com



# BLOCK: DESIGN\_DATA

## DESIGN DATA

### LIVE LOAD:

DESIGN LOADING: HL-93  
INVENTORY RATING: RF =  
OPERATING RATING: RF =  
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV): XXX (KIPS)

STRUCTURE IS DESIGNED FOR A FUTURE WEARING SURFACE OF 20 POUNDS PER SQUARE FOOT.

### MATERIAL PROPERTIES:

CONCRETE MASONRY:  
SUPERSTRUCTURE & STRUCTURAL APPROACH SLAB  $f'_c = 4,000$  PSI  
ALL OTHER  $f'_c = 3,500$  PSI

BAR STEEL REINFORCEMENT  
GRADE 60  $f_y = 60,000$  PSI  
STAINLESS, GRADE 60  $f_y = 60,000$  PSI

XX-W" PRESTRESSED GIRDERS:  
CONCRETE MASONRY  $f'_c = 8,000$  PSI  
STRANDS: XX" DIA. WITH ULTIMATE TENSILE STRENGTH OF 270,000 P.S.I.

STRUCTURAL CARBON STEEL:  
ASTM A709, GRADE 36  $f_y = 36,000$  PSI

HIGH STRENGTH STRUCTURAL STEEL:  
ASTM A709, GRADE 50  $f_y = 50,000$  PSI

## FOUNDATION DATA

ABUTMENTS TO BE SUPPORTED ON XXXXXX PILING DRIVEN TO A REQUIRED DRIVING RESISTANCE OF XXX TONS \*\* PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA.  
ESTIMATED XX'-0" LONG.  
ESTIMATED XX'-0" LONG.

PIER TO BE SUPPORTED ON XXXXXX PILING DRIVEN TO A REQUIRED DRIVING RESISTANCE OF XXX TONS \*\* PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA.  
ESTIMATED XX'-0" LONG.

\*\*THE FACTORED AXIAL RESISTANCE OF PILES IN COMPRESSION USED FOR DESIGN IS THE REQUIRED DRIVING RESISTANCE MULTIPLIED BY A RESISTANCE FACTOR OF 0.5 USING MODIFIED GATES TO DETERMINE PILE CAPACITY.

## HYDRAULIC DATA

### 100-YEAR FREQUENCY:

$Q_{100} =$  C.F.S.  
 $V_{100} =$  F.P.S.  
 $HW_{100} =$  EL.  
WATERWAY AREA = SQ. FT.  
DRAINAGE AREA = SQ. MI.  
ROADWAY OVERTOPPING = N/A  
SCOUR CRITICAL CODE =

### 2-YEAR FREQUENCY:

$Q_2 =$  C.F.S.  
 $V_2 =$  F.P.S.  
 $HW_2 =$  EL.

## TRAFFIC DATA

### FEATURE ON:

ADT = ( )  
R.D.S. = MPH

### FEATURE UNDER:

ADT = ( )  
R.D.S. = MPH

## DESIGN DATA (REHAB)

HS =  
HS =

(RATINGS TAKEN FROM HSIS, XXXXXX)

## FOUNDATION DATA (PDA)

ABUTMENTS TO BE SUPPORTED ON XXXXXX PILING DRIVEN TO A REQUIRED DRIVING RESISTANCE OF XXX TONS PER PILE AS DETERMINED BY THE PDA METHOD. ESTIMATED XX'-0" LONG.

PIER TO BE SUPPORTED ON XXXXXX PILING DRIVEN TO A REQUIRED DRIVING RESISTANCE OF XXX TONS PER PILE AS DETERMINED BY THE PDA METHOD. ESTIMATED XX'-0" LONG.

\*\*THE FACTORED AXIAL RESISTANCE OF PILES IN COMPRESSION USED FOR DESIGN IS THE REQUIRED DRIVING RESISTANCE MULTIPLIED BY A RESISTANCE FACTOR OF 0.65 USING THE PDA METHOD TO DETERMINE DRIVEN PILE CAPACITY.

## HYDRAULIC DATA

### 100-YEAR FREQUENCY:

$Q_{100} =$  C.F.S.  
 $Q_{BRIDGE} =$  C.F.S.  
 $Q_{ROADWAY} =$  C.F.S.  
 $V_{100} =$  F.P.S.  
 $HW_{100} =$  EL.  
WATERWAY AREA = SQ. FT.  
DRAINAGE AREA = SQ. MI.  
SCOUR CRITICAL CODE =

### ROADWAY OVERTOPPING

FREQUENCY = YEARS  
 $Q =$  C.F.S.  
HW. = EL.

### 2-YEAR FREQUENCY:

$Q_2 =$  C.F.S.  
 $V_2 =$  F.P.S.  
 $HW_2 =$  EL.

## FOUNDATION DATA (SPREAD ON SOIL)

ABUTMENTS WITH SPREAD FOOTINGS TO BE SUPPORTED BY UNDERLYING NATIVE SOILS WITH A REQUIRED FACTORED BEARING RESISTANCE OF XXX PSF\*\*. A GEOTECHNICAL ENGINEER WILL DETERMINE THE FACTORED BEARING RESISTANCE BY VISUAL INSPECTION PRIOR TO CONSTRUCTION OF THE ABUTMENT FOOTING.

PIERS WITH SPREAD FOOTINGS TO BE SUPPORTED BY UNDERLYING NATIVE SOILS WITH A REQUIRED FACTORED BEARING RESISTANCE OF XXX PSF\*\*\*. A GEOTECHNICAL ENGINEER WILL DETERMINE THE FACTORED BEARING RESISTANCE BY VISUAL INSPECTION PRIOR TO CONSTRUCTION OF THE PIER FOOTING.

\*\*\*THE FACTORED BEARING RESISTANCE IS THE VALUE USED FOR DESIGN.

## CURVE DATA

### FEATURE ON

P.I. =  
 $\Delta =$   
D =  
T =  
L =  
R =  
S.E. =  
P.C. =  
P.T. =

### FEATURE UNDER

P.I. =  
 $\Delta =$   
D =  
T =  
L =  
R =  
S.E. =  
P.C. =  
P.T. =

## FOUNDATION DATA (SPREAD ON ROCK)

ABUTMENTS WITH SPREAD FOOTINGS TO BE SUPPORTED BY SOUND ROCK WITH A REQUIRED FACTORED BEARING RESISTANCE OF XXX PSF\*\*\*. A GEOTECHNICAL ENGINEER WILL DETERMINE THE FACTORED BEARING RESISTANCE BY VISUAL INSPECTION PRIOR TO CONSTRUCTION OF THE ABUTMENT FOOTING.

PIERS WITH SPREAD FOOTINGS TO BE SUPPORTED BY SUPPORTED BY SOUND ROCK WITH A REQUIRED FACTORED BEARING RESISTANCE OF XXX PSF\*\*\*. A GEOTECHNICAL ENGINEER WILL DETERMINE THE FACTORED BEARING RESISTANCE BY VISUAL INSPECTION PRIOR TO CONSTRUCTION OF THE PIER FOOTING.

\*\*\*THE FACTORED BEARING RESISTANCE IS THE VALUE USED FOR DESIGN.

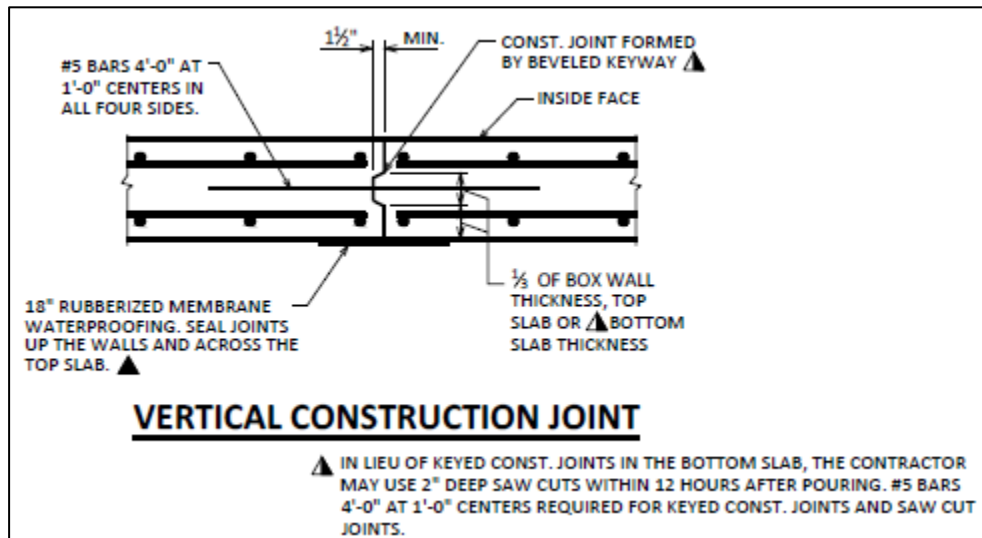
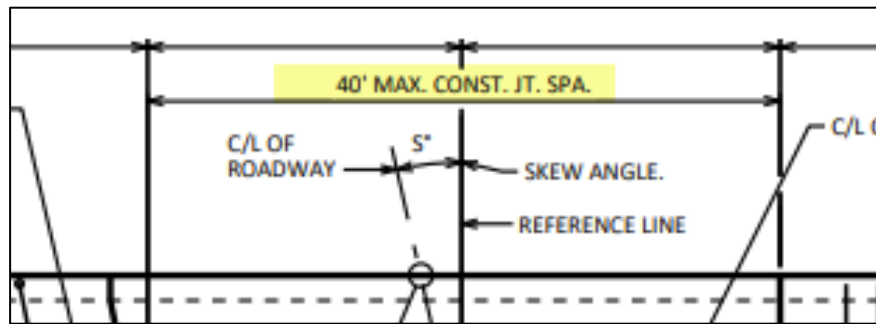
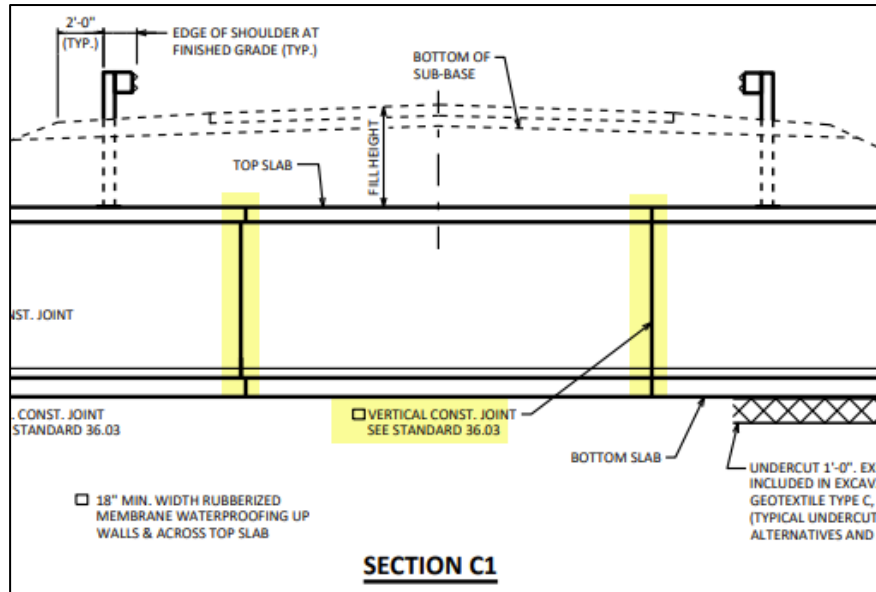
## FOUNDATION DATA (PRE-BORING)

ABUTMENTS TO BE SUPPORTED ON XXXXXX PILING SEATED IN PRE-BORED HOLES CORED XX FEET MINIMUM INTO ROCK. PILE DRIVING IS NOT REQUIRED. THE FACTORED AXIAL RESISTANCE OF THE PILES IN COMPRESSION USED FOR DESIGN IS XXX TONS MULTIPLIED BY A RESISTANCE FACTOR OR 0.5. ESTIMATED XX'-0" LONG.

PIERS TO BE SUPPORTED ON XXXXXX PILING SEATED IN PRE-BORED HOLES CORED XX FEET MINIMUM INTO ROCK. PILE DRIVING IS NOT REQUIRED. THE FACTORED AXIAL RESISTANCE OF THE PILES IN COMPRESSION USED FOR DESIGN IS XXX TONS MULTIPLIED BY A RESISTANCE FACTOR OR 0.5. ESTIMATED XX'-0" LONG.

(\*\*DESIGNER NOTES: THESE NOTES SHALL BE MODIFIED BASED ON SITE-SPECIFIC CONDITIONS, AS NEEDED. UNLESS NOTED OTHERWISE, SEATED PILES WILL BE BACKFILLED, WITHIN THE ROCK OR CONSOLIDATED MATERIAL, WITH A CEMENT GROUT ACCORDING TO STD. SPEC. 550.3.9.\*\*)

Add



## 509 Concrete Overlay and Structure Repair

### 509.1 Description

- (1) This section describes cleaning or scarifying areas of decks and approach pavements to be overlaid; removing and disposing any remaining asphaltic patches or unsound concrete from those areas; the furnishing, placing and curing concrete overlays; and full depth deck, surface, curb and joint repairs, as required.

### 509.2 Materials

- (1) Furnish a neat cement bonding grout for repairs receiving new concrete. Mix the neat cement in a water-cement ratio approximately equal to 5 gallons of water per 94 pounds of cement.
- (2) Furnish grade E conforming to [501](#) for overlays.
- (3) Furnish grade C or E concrete conforming to [501](#) for surface repairs. The contractor may increase the slump for grade E concrete to a maximum of 4 inches. For partial-depth horizontal repairs, the contractor may use pre-packaged horizontal rapid set concrete patch material from the APL instead of the grades of concrete designated above. For vertical and overhead repairs, use a pre-packaged vertical and overhead rapid set concrete patch material from the APL unless a different material is approved by the engineer in writing.
- (4) Furnish grade C or E concrete conforming to [501](#) for joint repairs, curb repairs, and full-depth deck repairs; except as follows:
  1. The contractor may increase slump of grade E concrete to 3 inches
  2. The contractor may use ready-mixed concrete
- (5) Provide QMP for class II ancillary concrete as specified in [716](#).

### 509.3 Construction

#### 509.3.1 General

- (1) Repair damage to existing epoxy-coated reinforcement remaining in place that is either uncovered by or damaged by the contractor's operations. Use a two-part epoxy resin conforming to materials and according to the methods specified in [ASTM A775](#) for field repairs and patching.
- (2) Clean and prepare surfaces receiving a pre-packaged rapid set concrete patch material per the manufacturer's recommendations and as follows. Thoroughly clean the surface upon which the new patch material is to be placed by brooming and using air pressure to remove all loose particles and dust. Apply a bonding agent to surfaces to be covered, as necessary and as recommended by the rapid set concrete patch material manufacturer.

#### 509.3.2 Equipment

- (1) Use a finishing machine to finish concrete overlays conforming to [502.3.7.8](#) and the following:
  1. The machine must have 2 linearly oscillating transverse screeds. For the front screed use, a synchronous vibratory screed with a variable frequency the operator can adjust. Provide enough identical vibrators to provide at least 2 vibrators for each 5 feet of screed length. Ensure that the bottom face of each screed is at least 7 inches wide with a rounded leading edge. Each screed must have an effective weight of at least 75 pounds per square foot of bottom face area. Provide each screed with the capability to positively control of the vertical position, the angle of tilt and the shape of the crown.
  2. The machine must have an adjustable metering device ahead of the leading screed that traverses the width of the machine.
  3. The machine must have capability of forward and reverse motion under positive control. Make provisions for raising the screeds to clear the screeded surface for traveling in reverse.
- (2) If placing concrete in a line next to a previously completed lane, equip the side of the finishing machine next to the completed lane, to travel on the lane.

#### 509.3.3 Cleaning

- (1) Under the Cleaning Decks and Cleaning Approaches bid items, clean the decks and approach pavements before placing the concrete overlay.
- (2) Use construction methods conforming to [502](#) and the following:
  1. Clean the entire surface of the bridge deck or approach pavement receiving the new concrete by using a suitable mechanical scarifier. Accomplish this in a way that prevents hooking or tearing the reinforcing steel and that removes at least one inch of concrete from the deck or pavement surface but not more than the maximum depth the plans show.
  2. If scarification is impracticable, as along curb faces or at expansion joints, remove deteriorated concrete to sound material by using chippers conforming to [509.3.4](#) for chippers.

3. Perform scarification before preparation. After completing scarification, remove the remaining asphaltic patches and unsound concrete as specified for preparation in [509.3.4](#).
4. Blast clean the entire surface of the deck and approach pavements being overlaid, exposed reinforcing steel, the vertical faces of curbs, sidewalks and parapets to the depth of the adjoining concrete overlay after completing preparation.
5. Clean the surface receiving the new concrete by mechanically dislodging contamination or debris and removing loose particles and dust with high-pressure water or air. Ensure that no free-standing water remains before placing grout and that cleaning water conforms to [501.2.6](#).

#### **509.3.4 Preparation**

- (1) Under the Preparation Decks and Preparation Approaches bid items, remove asphaltic patches and unsound or disintegrated areas of concrete decks and approach pavements as the plans show, or as the engineer directs.
- (2) Use construction methods conforming to [203](#) and the following:
  1. Under the Preparation Decks Type 1 bid item, remove existing asphaltic patching and unsound bridge deck concrete only to a depth that exposes 1/2 of the peripheral area of the top or bottom bar steel in the top mat of reinforcement.
  2. Under the Preparation Decks Type 2 bid item, remove existing unsound bridge deck concrete below the limit of the type 1 removal described above. One inch below the bottom of the top or bottom bar steel in the top mat of reinforcement is the minimum depth of type 2 removal. The engineer will direct any further removal.
  3. Remove the existing asphaltic patching and unsound concrete using equipment that causes no damage to the bridge floor. If chipping exposes the existing bar steel reinforcement for more than 1/2 of its peripheral area, and where bond between existing concrete and reinforcing bar has been destroyed, remove the adjacent concrete to provide a minimum one-inch clearance around the bar.
  4. For chipping off the old concrete surface, use air chippers or breakers that weigh no more than 35 pounds and are equipped with flat, chisel-type points with a cutting edge not less than 3/4 inch or greater than 3 inches wide.
  5. After reaching the top of the reinforcing steel, do not use hammers heavier than 15 pounds within one inch of the steel.
  6. Dispose of old concrete and asphaltic patching removed away from the bridge site. Implement necessary procedures to minimize debris dropping into the stream, streambed, roadway, or right-of-way below.

#### **509.3.5 Joint Repair**

- (1) Under the Joint Repair bid item, remove and dispose of deteriorated concrete at existing joints over piers, abutments and deck ends and other locations, and form new joints as the plans show, and the engineer directs.
- (2) Use construction methods conforming to [203](#), [502](#), and the following:
  1. Remove the concrete at an existing joint to be replaced to the limits the plans show, or as the engineer directs. Place a 1/2 inch deep saw cut at the line of removal on the bottom edge of the deck to control concrete breakout or cover the line of removal with a 1 1/2 inch thick layer of concrete to cover reinforcing steel exposed during joint repair. Use removal equipment that causes no damage to the portion of the concrete floor, curbs, and reinforcing steel remaining in place. Do not use tractor-mounted rams for removal operations within 9 inches of the edge, or within the depth of the slab from the edge, whichever is less.
  2. Preserve and reuse required existing reinforcing steel, and blast clean, realign, and retie, as the engineer deems necessary. If additional reinforcement is required, use grade 60 steel conforming to [AASHTO M31](#), and to [505.2](#).
  3. Dispose of removed material as specified in [509.3.4](#).
  4. Clean the surface receiving the new concrete by brooming and water pressure using a high-pressure nozzle to remove loose particles and dust.
  5. Immediately before placing concrete, coat the surfaces of the old concrete receiving new concrete with neat cement as specified for concrete overlays in [509.3.9.2](#).
  6. Restore painted surfaces damaged by any construction operation to the satisfaction of the engineer.
  7. Place concrete as specified for joint repair in [509.3.9.1](#).

#### **509.3.6 Curb Repair**

- (1) Under the Curb Repair bid item, remove and dispose of portions of deteriorated concrete on the concrete curbs and form new curb faces, top or back as the plans show.
- (2) Use construction methods conforming to [203](#), [502](#), and the following:
  1. Take the precautions necessary while removing deteriorated concrete to preserve existing reinforcing steel. Clean, realign, and retie existing reinforcing steel, as the engineer considers necessary.

2. Remove concrete to sound concrete or at least one inch behind existing reinforcing steel as the plans show and the engineer directs.
3. Make a 1/2-inch deep saw cut at the limits of curb repair before removing the deteriorated concrete.
4. Dispose of removed material as specified in [509.3.4](#).
5. Clean the surface against which placing the new concrete to remove loose particles and dust, and keep continuously wet for 2 hours before placing new concrete. Immediately before placing concrete, coat the surfaces of old concrete with neat cement as specified in [509.3.9.2](#).
6. Place concrete as specified in [509.3.9.1](#).

### **509.3.7 Concrete Surface Repair**

- (1) Under the Concrete Surface Repair bid item, remove those portions of abutments, piers, girders, and other elements that the plans show, and the engineer directs, and replace those portions with concrete.
- (2) Use construction methods conforming to [203](#), [502](#), and the following:
  1. Take necessary precautions while removing deteriorated concrete to preserve existing reinforcing steel. Clean, realign, and retie existing reinforcing steel, as the engineer considers necessary.
  2. Remove concrete to sound concrete or to one inch behind the existing reinforcing steel, whichever depth is greater, at locations the plans show or as the engineer directs.
  3. Make a 1/2-inch deep saw cut at the limits of the concrete surface repair before removal of the deteriorated concrete.
  4. Dispose of removed material as specified in [509.3.4](#).
  5. Clean the surfaces against which placing the new concrete to remove loose particles and dust, and keep continuously wet for a period of 2 hours before placing new concrete.

### **509.3.8 Full Depth Deck Repair**

- (1) Under the Full-Depth Deck Repair bid item, perform full-depth removal of unsound concrete at locations on the deck as the engineer directs, and then prepare and form these areas.
- (2) Use construction methods conforming to [203](#), [502](#), and the following:
  1. Completely remove the existing concrete deck areas being repaired using equipment that causes no significant damage to that portion of the structure remaining in place. Preserve and reuse required existing reinforcing steel.
  2. If damage occurs to anything designated for re-use in the new work repair, or replace it at no expense to the department.
  3. Dispose of removed material as specified in [509.3.4](#).
  4. Blast clean, realign, and retie the existing reinforcing steel to be re-used, as the engineer considers necessary.
  5. Clean the vertical surface receiving the new concrete by brooming and water pressure to remove loose particles and dust, and keep continuously wet for 2 hours before placing concrete. Immediately before placing concrete in the full depth deck replacement, coat the entire surface receiving the new concrete with neat cement as specified in [509.3.9.2](#).
  6. Place the concrete for the repair as specified in [509.3.9.1](#).

### **509.3.9 Concrete**

#### **509.3.9.1 General**

- (1) Under the Concrete Masonry Overlay Decks and Concrete Masonry Overlay Approaches bid items, construct a concrete overlay course on concrete deck and approach pavement to the lines, grades, thickness, and cross-section the plans show, or the engineer directs.
- (2) Use construction methods conforming to [502](#) and the following:
  1. For joint repair, place the concrete and consolidate by vibrating in the prepared joints before placing the overlay.
  2. For curb repair, place the concrete, consolidate, and strike off to the required alignment for curb faces, tops, and backs.
  3. For full depth deck repair, place the concrete; consolidate by internal vibration, and strike off to the existing deck elevation before placing the overlay.

#### **509.3.9.2 Placing Concrete Overlays**

- (1) Do not place the concrete overlay less than 24 hours after placing concrete in the joint repair and full-depth deck repair areas.
- (2) Immediately before placing the concrete overlay, coat the surface of the bridge decks or approach pavement being overlaid, and vertical joints with a neat cement mixture. Ensure the surface of the



existing deck is moist without any standing water before coating with the neat cement mixture. Brush the neat cement over the prepared concrete surface to ensure all parts receive an even coating and do not allow excess neat cement to collect in pockets. Apply the neat cement at a rate that ensures the cement does not dry out before covering with the new concrete.

- (3) Place concrete for deck preparation immediately in front of the overlay course and vibrate internally in addition to surface screed vibration. Place concrete in a single operation, with no construction joints in the overlay section except as the plan show or the engineer directs. Do not place concrete if the ambient air temperature is above 88 F.
- (4) The contractor may operate the finishing machine with the transverse screeds normal to the centerline of the structure. Conduct bridge deck finishing operations so that the elapsed time between depositing the concrete on the deck and final screeding does not exceed 10 minutes.
- (5) If the plan requires construction joints, make them sharp-edged, perpendicular to the overlay surface, at the locations the plan show, and true to the alignments the plan show.
- (6) Provide the final surface finish specified in [502.3.7.8](#) for floors of structures having approach pavements with design speeds of 40 mph or greater, except there is no requirement for the turf drag or broom finish.
- (7) Form or saw contraction joints to the width, depth, and at locations the plans show and seal as the plans show. Begin sawing joints within 6 hours after placing the concrete, unless the engineer directs otherwise, and complete within 12 hours.

#### **509.3.9.3 Curing Concrete Overlays**

- (1) Cure concrete overlays as specified for curing concrete in floors, wearing surfaces, and sidewalks in [502.3.8](#), including fogging, and allow to cure for 3 days.

#### **509.3.9.4 Opening to Traffic**

- (1) Do not allow traffic on the completed overlay for a minimum of 3 days after placement. The engineer may extend this time if conditions warrant.
- (2) If placing concrete in a line next to a previously completed lane, the engineer will allow the contractor to operate the finishing machine on the completed lane when all the following conditions are met:
  1. The overlay concrete cures for at least 12 hours.
  2. Concrete attains a verified compressive strength of 1000 psi.
  3. The contractor submits calculations showing the applied bearing pressure is less than 500 psi per point load location.
  4. Curing of the previously completed lane(s) is maintained continuously as specified in [502.3.8.2](#).

#### **509.4 Measurement**

- (1) The department will measure Preparation Approaches and the Preparation Decks bid items by the square yard acceptably completed. The department will not subtract areas of type 2 removal from areas of type 1 removal. The department will subtract areas of full-depth deck repair, the engineer directs before beginning the type 1 or type 2 deck removals, from the areas of the type 1 or type 2 removals. The department will not subtract areas of full-depth deck repair, the engineer directs after type 1 or type 2 deck removals are underway, from the areas of the type 1 or type 2 removals. The department will not measure areas of joint repair under these bid items.
- (2) The department will measure Cleaning Decks, Cleaning Approaches, Joint Repair, and Full-Depth Deck Repair by the square yard acceptably completed.
- (3) The department will measure Curb Repair by the linear foot acceptably completed.
- (4) The department will measure Concrete Surface Repair by the square foot acceptably completed, measured as the exposed surface area, following removal, as delineated by the saw cuts.
- (5) The department will measure the Concrete Masonry Overlay bid items by the cubic yard acceptably completed. The department will include the volume of concrete used in associated approach and deck preparation, joint repair, curb repair, and in full-depth deck repair as part of the Concrete Masonry Overlay bid items. The department will compute yardage based on the nominal cubic yard of concrete from the contractor's mix design. The department will not measure wasted concrete.

#### **509.5 Payment**

##### **509.5.1 General**

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

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
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509.0200	Preparation Approaches	SY
509.0300 - 0399	Preparation Decks (type)	SY
509.0500	Cleaning Decks	SY
509.0600	Cleaning Approaches	SY
509.1000	Joint Repair	SY
509.1200	Curb Repair	LF
509.1500	Concrete Surface Repair	SF
509.2000	Full-Depth Deck Repair	SY
509.2500	Concrete Masonry Overlay Decks	CY
509.2600	Concrete Masonry Overlay Approaches	CY

- (2) Repairing damage to existing reinforcement is incidental to the contract.

#### **509.5.2 Preparation**

- (1) Payment for Preparation Approaches and the Preparation Decks bid items is full compensation for removing asphaltic patches and unsound concrete; and for disposing of waste materials.
- (2) The department will pay separately for the volume of concrete used under the Concrete Masonry Overlay bid items.

#### **509.5.3 Cleaning**

- (1) Payment for Cleaning Decks and Cleaning Approaches is full compensation for scarifying, and cleaning the deck or approaches; and for blast cleaning the entire deck or approaches, including exposed existing reinforcing steel.

#### **509.5.4 Joint Repair**

- (1) Payment for Joint Repair is full compensation for removing and disposing of deteriorated concrete, and for forming new joints.
- (2) The department will pay separately for the volume of concrete used under the Concrete Masonry Overlay bid items.
- (3) The department will not pay for restoration of painted surfaces damaged by construction operations.

#### **509.5.5 Curb Repair**

- (1) Payment for Curb Repair is full compensation for removing and disposing of deteriorated concrete; for forming; and for disposing of waste material.
- (2) The department will pay separately for the volume of concrete used under the Concrete Masonry Overlay Decks bid item.

#### **509.5.6 Concrete Surface Repair**

- (1) Payment for Concrete Surface Repair is full compensation for providing the repair; for removing and disposing of deteriorated concrete; for cleaning reinforcing steel; and for the volume of concrete used in the surface repair.

#### **509.5.7 Full Depth Deck Repair**

- (1) Payment for Full-Depth Deck Repair is full compensation for completely removing the deteriorated concrete areas; for disposing of waste material; for forming; and for salvaging and using the existing bar steel reinforcement. The department will pay for this bid item at the contract unit price regardless of whether the engineer directs it before or after beginning the type 1 or type 2 removals.
- (2) The department will pay separately for the volume of concrete used under the Concrete Masonry Overlay Decks bid item.

#### **509.5.8 Concrete Overlays**

- (1) Payment for the Concrete Masonry Overlay bid items is full compensation for providing the overlay; for the concrete used including the volume needed to complete the work done under the associated Preparation Approaches, Preparation Decks, Joint Repair, Curb Repair, and Full-Depth Deck Repair bid items; and for sawing and sealing joints.



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## **Approved Product List Application Process for Horizontal Rapid Set Concrete Patch Material**

Wisconsin Department of Transportation (WisDOT) requires horizontal rapid set concrete patch materials used in concrete projects from the approved product list (APL). This APL approval process covers materials with cementitious, polymer-modified cementitious, and fully polymeric continuous phase components. Products on this list are not to be used for full-depth repairs for structural applications.

### **Approval Process**

- To apply for WisDOT's APL process for horizontal rapid set concrete patch material, the manufacturer/supplier must submit the required information listed below for WisDOT's review:
  - Safety Data Sheet
  - Technical Data Sheet
  - American Association of State Highway and Transportation Officials (AASHTO) Product Evaluation & Audit Solutions (formerly NTPEP) or any accredited (AASHTO or Cement and Concrete Reference Laboratory (CCRL)) independent laboratory test data showing the rapid set concrete set concrete patch material has met or exceeded the requirements in outlined in the material property requirements section.
    - Horizontal rapid set concrete set concrete patch materials will be evaluated with the aggregates included in the samples (extended form). The tests must be conducted with coarse and fine aggregates added per the manufacturer's recommendations for each material.
    - If submitting an independent laboratory test data, include the AASHTO/CCRL certification of the testing laboratory.
  - Manufacturer's installation instructions including surface preparation, bonding, and curing requirements for the product seeking approval.
  - Primary point of contact for the submitted product including name, email address, phone number, and mailing address.
- The submitted test data must be less than five years old. Submit the above required information to [DOTProductSubmittal@dot.wi.gov](mailto:DOTProductSubmittal@dot.wi.gov).
- By applying, the manufacturer/supplier certifies that they have reviewed the standards/requirements, and their product meets the requirements. WisDOT may reject an APL submittal without further review if WisDOT determines that the product does not meet standards/requirements.
- Applications will be reviewed within 4 weeks of submittal and when the review is completed, manufacturers/suppliers will be notified. Approved products will be listed on the department's APL.

## Material Property Requirements

### Cementitious and Polymer-modified Cementitious Materials

- The Cementitious and Polymer-modified Cementitious rapid set concrete patch material must meet the testing requirements as specified in Table 1.

**Table 1.** Cementitious and Polymer-Modified Cementitious Material Test Requirements

Test	ASTM/AASHTO Standard	Age/Procedure	Minimum Requirements
Compressive Strength (psi)	ASTM C39/ AASHTO T22	3 hours	$\geq 2,000$
		24 hours	$\geq 5,000$
Freeze-Thaw Durability	ASTM C666/ AASHTO T161	Procedure A, Durability Factor	90% at 300 cycles
Length Change (%)	ASTM C157/ AASHTO T160	Water and air, 28 days	Maximum +/- 0.15
Bond Strength in Direct Tension (psi)	ASTM C1583	28 days	$\geq 300$
Initial Set Time (min)	ASTM C403	Initial set (500 psi) time	$\geq 15$
Rapid Chloride Permeability (Coulombs)	ASTM C1202	28 days	$\leq 2,500$

### Fully Polymeric Materials

- The Fully Polymeric rapid set concrete patch material must meet the testing requirements as specified in Table 2.

**Table 2.** Fully Polymeric Material Test Requirements

Test	ASTM/AASHTO Standard	Age/Procedure	Minimum Requirements
Compressive Strength (psi)	ASTM C579	3 hours	$\geq 2,000$
		24 hours	$\geq 5,000$
Freeze-Thaw Durability	ASTM C666/AASHTO T161	Procedure A, Durability Factor	90% at 300 cycles
Linear Shrinkage	ASTM C531	Maximum linear length change at 7 days (%)	Maximum +/- 0.10
Coefficient of Thermal Expansion (CTE)		Coefficient of Thermal Expansion	$2 \times 10^{-6}$ to $8 \times 10^{-6}$
Bond Strength in Direct Tension (psi)	ASTM C1583	28 days	$\geq 300$
Initial Set Time (min)	ASTM C403	Initial set (500 psi) time	Minimum 15
Rapid Chloride Permeability (Coulombs)	ASTM C1202	28 days	$\leq 2,500$

### **Compliance**

- To remain on the WisDOT APL, the manufacturer/supplier must reapply every 5 years.
- The department may request re-compliance at any time.

### **Non-Compliance**

- WisDOT will continue to regard this approval valid for 5 years unless/until any of the following conditions arise:
  - If the manufacturer/supplier changes the product physical or chemical properties without notifying WisDOT.
  - The product samples audited/tested by WisDOT do not meet the requirements as specified in this document.
- Manufacturers/suppliers are required as a condition of approval to inform WisDOT of any of the above conditions as soon as they become aware of them.

### **Correspondence**

If the name and/or address of the contact person in your company for this correspondence have changed, or if you have questions or need further information, please contact us via email [DOTProductSubmittal@dot.wi.gov](mailto:DOTProductSubmittal@dot.wi.gov).





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Division of Transportation System Development  
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## **Approved Product List Application Process for Non-Shrink Grout Material**

Wisconsin Department of Transportation (WisDOT) requires non-shrink (packaged dry, hydraulic cement) grout materials used in concrete projects from the approved product list (APL).

### **Approval Process**

- To apply for WisDOT's APL process for non-shrink grout material, the manufacturer/supplier must submit the required information listed below for WisDOT's review:
  - Safety Data Sheet
  - Technical Data Sheet
  - American Association of State Highway and Transportation Officials (AASHTO) Product Evaluation & Audit Solutions (formerly NTPEP) or any accredited (AASHTO or Cement and Concrete Reference Laboratory (CCRL)) independent laboratory test data showing the non-shrink grout material has met or exceeded the requirements in outlined in the material property requirements section.
    - If submitting an independent laboratory test data, include the AASHTO/CCRL certification of the testing laboratory.
  - Manufacturer's installation instructions including surface preparation, bonding, and curing requirements for the product seeking approval.
  - Primary point of contact for the submitted product including name, email address, phone number, and mailing address.
- The submitted test data must be less than five years old. Submit the above required information to [DOTProductSubmittal@dot.wi.gov](mailto:DOTProductSubmittal@dot.wi.gov).
- By applying, the manufacturer/supplier certifies that they have reviewed the standards/requirements, and their product meets the requirements. WisDOT may reject an APL submittal without further review if WisDOT determines that the product does not meet standards/requirements.
- Applications will be reviewed within 4 weeks of submittal and when the review is completed, manufacturers/suppliers will be notified. Approved products will be listed on the department's APL.

### **Material Property Requirements**

- The non-shrink grout material must be freeze-thaw resistant, non-corrosive, and suitable for exterior application and must meet the testing requirements as specified in Table 1.

**Table 1. Non-shrink Grout Material Requirements**

Test	Standard	Age/Procedure	Requirements
Compressive strength (psi)	ASTM C1107	3 days	≥ 2,500
		7 days	≥ 3,500
		28 days	≥ 5,000
Early height change (%)	ASTM C1107/ ASTM C827	at time of final setting	maximum +4.0
Height change of moist cured hardened grout (%)	ASTM C1107/ ASTM C1090	1, 3, 7, and 28 days	0.0 to +0.3
Shrinkage (%)	ASTM C1107/ ASTM C157	56 days	0 from max expansion
Freeze-Thaw Durability	ASTM C666/ AASHTO T161	Procedure A, Durability Factor	90% at 300 cycles
Rapid Chloride Permeability (Coulombs)	ASTM C1202	28 days	≤ 2,000

**Non-shrink Grout Material for High Strength Application in Structures**

- Manufacturers seeking product approval for structural applications like shear key and other high strength application must meet the higher compressive and bond strength requirements as specified in Table 2.

**Table 2. Non-shrink Grout Material Requirements for High Strength Application in Structures**

Test	Standard	Age	Requirements
Bond Strength (psi)	ASTM C882	24 hours	> 1,000
Compressive Strength (psi) <sup>[1]</sup>	ASTM C109	3 days	≥ 5,000
		7 days	> 6,000
Early height change (%)	ASTM C1107/ ASTM C827	at time of final setting	maximum +4.0
Height change of moist cured hardened grout (%)	ASTM C1107/ ASTM C1090	1, 3, 7, and 28 days	0.0 to +0.3
Shrinkage (%) <sup>[2]</sup>	ASTM C1107/ ASTM C157	56 days	0 from max expansion
Freeze-Thaw Durability	ASTM C666/ AASHTO T161	Procedure A, Durability Factor	90% at 300 cycles
Rapid Chloride Permeability (Coulombs)	ASTM C1202	28 days	≤ 2,000

<sup>[1]</sup> For shear key grout, compression strength shall be based on the mixing ratio to achieve flowability (flowable/fluid).

<sup>[2]</sup> Height change of hardened grout at 56 days of age when exposed to air drying for 28 days after 28 days of moist curing.

**Compliance**

- To remain on the WisDOT APL, the manufacturer/supplier must reapply every 5 years.
- The department may request re-compliance at any time.

**Non-Compliance**

- WisDOT will continue to regard this approval valid for 5 years unless/until any of the following conditions arise:
  - If the manufacturer/supplier changes the product physical or chemical properties without notifying WisDOT.

- The product samples audited/tested by WisDOT do not meet the requirements as specified in this document.
- Manufacturers/suppliers are required as a condition of approval to inform WisDOT of any of the above conditions as soon as they become aware of them.

### **Correspondence**

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## **Approved Product List Application Process for Vertical and Overhead Rapid Set Concrete Patch Material**

Wisconsin Department of Transportation (WisDOT) requires pre-packaged vertical and overhead rapid set concrete patch materials used in concrete projects from the approved product list (APL).

### **Approval Process**

- To apply for WisDOT's APL process for pre-packaged vertical and overhead rapid set concrete patch material, the manufacturer/supplier must submit the required information listed below for WisDOT's review:
  - Safety Data Sheet
  - Technical Data Sheet
  - American Association of State Highway and Transportation Officials (AASHTO) Product Evaluation & Audit Solutions (formerly NTPEP) or any accredited (AASHTO or Cement and Concrete Reference Laboratory (CCRL)) independent laboratory test data showing the vertical and overhead rapid set concrete patch material has met or exceeded the requirements in outlined in the material property requirements section.
    - If submitting an independent laboratory test data, include the AASHTO/CCRL certification of the testing laboratory.
  - Manufacturer's installation instructions including surface preparation, bonding, and curing requirements for the product seeking approval.
  - Primary point of contact for the submitted product including name, email address, phone number, and mailing address.
- The submitted test data must be less than five years old. Submit the above required information to [DOTProductSubmittal@dot.wi.gov](mailto:DOTProductSubmittal@dot.wi.gov).
- By applying, the manufacturer/supplier certifies that they have reviewed the standards/requirements, and their product meets the requirements. WisDOT may reject an APL submittal without further review if WisDOT determines that the product does not meet standards/requirements.
- Applications will be reviewed within 4 weeks of submittal and when the review is completed, manufacturers/suppliers will be notified. Approved products will be listed on the department's APL.

### **Material Property Requirements**

- Vertical and overhead rapid set concrete patch materials must be able to counteract the effects of gravity and must be suitable for exterior application demonstrating resistance to corrosion, freeze-thaw, and deicing salts.
- The vertical and overhead rapid set concrete patch material must meet the testing requirements as specified in Table 1.

**Table 1.** Vertical and Overhead Rapid Set Concrete Patch Material Test Requirements

Test	ASTM/AASHTO Standard	Age/Procedure	Minimum Requirements
Compressive Strength (psi)	ASTM C109/ AASHTO T106/ ASTM C928	1 days	≥ 2,000
		7 days	≥ 4,000
		28 days	≥ 4,000
Freeze-Thaw Durability	ASTM C666/ AASHTO T161	Procedure A, Durability Factor	90% at 300 cycles
Length Change (%)	ASTM C157/ AASHTO T160/ ASTM C928	Water and air, 28 days	Maximum +/- 0.15
Bond Strength in Direct Tension (psi)	ASTM C1583	28 days	≥ 200
Slant Shear Bond Strength (psi)	ASTM C882/ASTM C928	1 day	≥ 1,000
		7 days	≥ 1,500
Rapid Chloride Permeability (Coulombs)	ASTM C1202	28 days	≤ 2,000

**Compliance**

- To remain on the WisDOT APL, the manufacturer/supplier must reapply every 5 years.
- The department may request re-compliance at any time.

**Non-Compliance**

- WisDOT will continue to regard this approval valid for 5 years unless/until any of the following conditions arise:
  - If the manufacturer/supplier changes the product physical or chemical properties without notifying WisDOT.
  - The product samples audited/tested by WisDOT do not meet the requirements as specified in this document.
- Manufacturers/suppliers are required as a condition of approval to inform WisDOT of any of the above conditions as soon as they become aware of them.

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