

Concrete Updates

Tirupan Mandal and Jackie Spoor

WisDOT and WCPA

2024 WTBA Conference

January 18th, 2024

Outline

- Staffing Updates
- 2024 Spec Updates
- Additional Special Provisions 6 (ASP 6) changes
- Specification Re-Organization
- Sustainability in Concrete
- Recycled Concrete Study
- Approved Products List (APL)
- Jointing
- Dowel Bar Placement
- Concrete Overlays



Staffing Updates



WisDOT: Concrete Materials Unit

Tirupan Mandal – Supervisor
Adam Albers – Aggregates & Lab Engineer
Aleksandra Graff – Concrete Engineer
Mark Finnell – Concrete Consultant Engineer
Josh Seaman – Aggregate Lab
Josh Hammer – Cement Lab
Zach Gambetty – Metals & Geosynthetics Lab
Joe Jeruc – Lab Wide



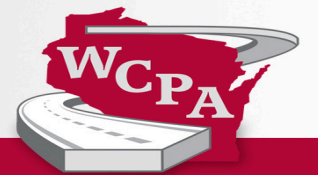
WCPA

Jackie Spoor – President

Kevin McMullen – Vice President

Leslie Ashauer – Director of Engineering

Samantha Graves – Business Manager



2024 Spec Updates



Manual of Test Procedures (MOTP)

WisDOT Manual of Test Procedures – PCC

WTM R100

Effective with November 2023 Letting
Revised Date: 09/13/2023

Follow AASHTO R100 *Standard Method of Test for Making and Curing Concrete Test Specimens in the Field* with the following modifications:

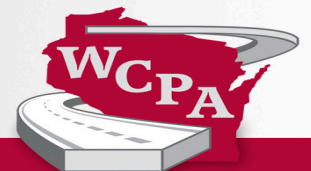
AASHTO R100-21 Section	WisDOT Modification:
2.1	Replace the AASHTO R60, T119 and T152 references with the following WisDOT Modified versions: WTM R60 – Sampling Freshly Mixed Concrete WTM T119 – Slump WTM T152 – Air Content Type B
6.1	Replace Section 6.1 with the following: Cylinder Specimens – Compressive or splitting tensile strength specimens shall be 6 x 12-inch cylinders cast and allowed to set in an upright position.
6.2	Replace Section 6.2 with the following: Beam Specimens – Flexural specimen shall be 6 x 6 x 21-inch beams of concrete cast and hardened with the long axes horizontal.
10.1.2	Replace Section 10.1.2 with the following: Initially cure molded specimens at a temperature of 16 - 27°C (60°F - 80°F). Initially cure the molded specimens for 24 to 48 hours. If specimens cannot get transported to the final cure location within 48 hours, strip the cylinder mold at 24 ± 8 hours, then place it back into a proper lime-saturated curing water bath at a temperature of 22.5 ± 1.5°C (73 ± 3°F) according to AASHTO M 201, Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes. If specimens can be transported to the final cure location within 48 hours leave the specimens in place during transportation, then strip the molds when the specimens get to the final cure location. Specimens must be marked with the date and time the specimen were cast, the project number, and the specimen number.
11.1	Replace Section 11.1 with the following: After the 24 to 48 hour initial cure, the specimens will be transported to the laboratory to be stored under standard conditions. While in transport, the specimen must be protected from freezing or moisture loss. Specimen must also be secured so that the axis is vertical (held straight, up and down).

- Effective with 2024 Specifications
- Need ASTM/AASHTO Procedure & MOTP
- Mid Year update for Errors noticed
- Annual Updates
- Location: QMP Webpage, bid letting website, Structure and road resources website, and Roadway Standards website

6.	TESTING REQUIREMENTS
6.1.	<i>Cylindrical Specimens</i> —Compressive or splitting tensile strength specimens shall be cylinders cast and allowed to set in an upright position. The number and size of cylinders cast shall be as directed by the specifier of the tests. In addition, the length shall be twice the diameter, and the cylinder diameter shall be at least three times the nominal maximum size of the coarse aggregate. When the nominal maximum size of the coarse aggregate exceeds 50 mm (2 in.), the concrete sample shall be treated by wet sieving through a 50-mm (2-in.) sieve as described in R 60. For acceptance testing for specified compressive strength, cylinders shall be 152 by 300 mm (6 by 12 in.) or 100 by 200 mm (4 by 8 in.) (Note 3). Note 3 —When molds in SI units are required and not available, equivalent inch-pound unit size molds should be permitted.
6.2.	<i>Beam Specimens</i> —Flexural strength specimens shall be beams of concrete cast and hardened with long axes horizontal. The length shall be at least 50 mm (2 in.) greater than three times the depth as tested. The ratio of width to depth as molded shall not exceed 1.5.
6.2.1.	The minimum cross-sectional dimension of the beam shall be as stated in Table 2. Unless otherwise specified by the specifier of the tests, the standard beam shall be 152 by 152 mm (6 by 6 in.) in cross section.



SCAN ME

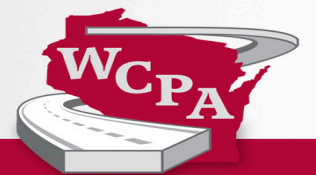


Changes in Specification

- Bid Items:

- Base Patching (ASP 6)
 - 390.0305 (HES)
 - 390.0405 (SHES)
- Truck Aprons – moved to Class I
 - 415.2000 – 415.2050
 - Color paid separately
- Concrete Driveway
 - 602.0800 – 602.0849
 - 602.0850 – 602.0899 (HES)
- Concrete Surface Drains
 - 602.3010
 - 602.3015 (HES)
- Concrete Rumble Strips
 - 602.3210 – 602.3279 (location, type)
 - 602.3280 (transverse)

- Trial Batching SS 715.2.2.1(1)
 - 3 trial batches
 - Pavements and Barrier
- HES Mixes SS 710.4(6)
 - Contract Convenience – add any amount up to 280 lbs/cy
- SAM Testing
 - No field testing effective with November 2023 LET's
 - Required for Mix Designs



2024 Spec Updates

415: Concrete Pavements

• Concrete Truck Aprons

- Now in **Class I**
- Must follow the requirements per 710 and 715
- 2023 and older contracts: Truck aprons are still Class II
- Reason: Being loaded by heavy trucks

• Expansion Joint Filler (415.2.3)

- Added **AASHTO** and **ASTM** Standards
- SDD's require an additional inch

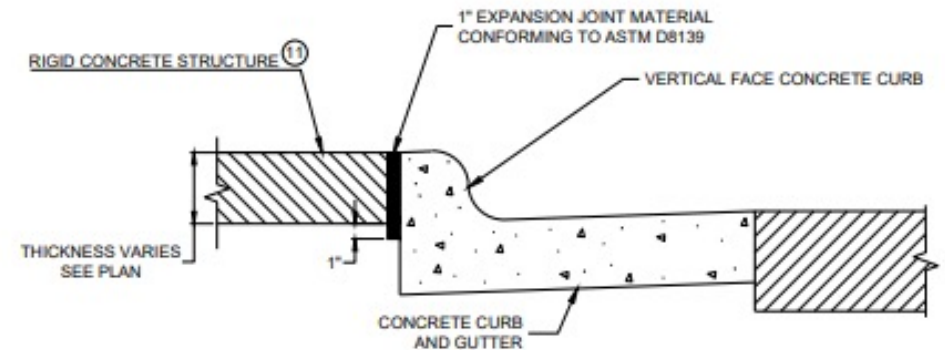
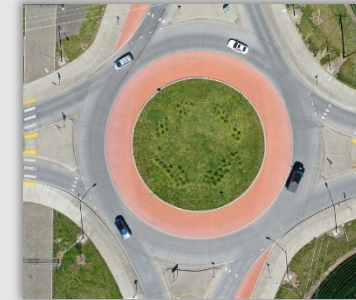


415 Concrete Pavement

415.1 Description

415 Move truck apron information from 416 to 415 Class I pavement section. Define allowable joint filler material for specific applications.

(1) This section describes constructing concrete pavement as well as approach slabs, alleys, pavement gaps, and truck aprons.



EXPANSION JOINT DETAIL FOR VERTICAL CURB ABUTTING A RIGID STRUCTURE (1)

2024 Spec Updates

416: Concrete Pavements – Repair and Replacement

- **Section Title**

- Originally “Appurtenant Construction”
- **Renamed** to “Repair and Replacement”
- Reason: To reflect the original intent for this section

- **Concrete Pavement Repair and Replacement (416.2.3)**

- **Grade A or C** concrete can be used
- **Opening strength** changed to **2000 psi** from 3000 psi

416.2.3 Concrete Pavement Repair and Replacement

416.2.3 Add via ASP-6 for Nov 2022 LET. Reduced opening strength from 3000 psi to 2000 psi for concrete pavement repair and replacement. Revise and renumber section since ASP-6 to allow grade A concrete for pavement repair and replacement.

- (1) Use grade **A** or **C** concrete as specified in [501](#).
- (2) The engineer will allow the contractor to open to construction and public traffic when the concrete reaches 2000 psi.



2024 Spec Updates

416: Concrete Pavements – Repair and Replacement

- **Special High Early Concrete (416.2 and 416.3)**
 - Calcium chloride updated according to AASHTO M144
 - **Opening strength of 2000 psi** instead of 3000 psi
 - Required **cement quantity** removed

BID ITEM	STRENGTH (psi)
Concrete Base (SS 320)	2,000
Concrete Base HES (SS 320)	
Base Patching HES (SS 390)	
Base Patching SHES (SS 390)	
Concrete Pavement Repair (SS 416) - NEW	
Concrete Pavement Repair SHES (SS 416) - NEW	
Concrete Pavement Replacement (SS 416) - NEW	
Concrete Pavement Replacement SHES (SS 416) - NEW	
Concrete Driveway (SS 602)	
• Residential - NEW	
• Commercial / Industrial - NEW	



2024 Spec Updates

416: Concrete Pavements – Repair and Replacement

• Construction (416.3)

- **General construction (416.3.1)** language revised
- **Placing concrete (416.3.6.1)** language added
- **Concrete driveways, surface drains, and rumble strips** moved to 602
- **Drilled tie bar payment (416.5.1 (3))** information added



- (3) **Payment for Drilled Tie Bars** is full compensation for providing tie bars, including coating; for drilling holes in hardened concrete not placed under the contract; and for epoxying or driving. Drilled Tie Bars into hardened concrete placed under the contract will be paid for when the following is met:
- Adjacent concrete is to be removed in a subsequent stage and concrete placed must abut the existing concrete.
 - Bent tie bars are not able to be inserted into concrete placed under the contract due to traffic staging operations.



2024 Spec Updates

501: Concrete

- **Aggregate Gradations (501.2.7.4.2)**
 - **Coarse and Fine aggregate individual gradations removed**
 - **Confusion over individual or blended gradation for acceptance**
 - **Blend of aggregates more important than individual gradations**
- **Slump (501.3.7.1)**
 - **Slump defined**

501.2.7.4.2 Aggregate Gradations

- (1) Use well graded fine and coarse aggregate conforming to the blended aggregate gradation limits specified in table 501-4.
- (2) The department will accept aggregates based on the blended aggregate gradations as batched. Calculate blended values using the actual batch percentages for the component aggregates.

TABLE 501-4 AGGREGATE MASTER GRADATION LIMITS

SIEVE	COMBINED AGGREGATE GRADATION		OPTIMIZED AGGREGATE GRADATION (OAG)
	STANDARD	100 % PASSING 1-inch sieve	TARANTULA CURVE GRADATION BAND
	(% passing by weight)		(volumetric % retained)
2-inch	100	100	0
1 1/2-inch	96 - 100	100	<= 5
1-inch	70 - 99	100	<= 16
3/4-inch	55 - 96	95 - 100	<= 20
1/2-inch	48 - 86	75 - 91	4-20
3/8-inch	38 - 77	56 - 80	4-20
No. 4	30 - 60	42 - 60	4-20
No. 8	25 - 53	36 - 55	<= 12
No. 16	20 - 44	27 - 45	<= 12
No. 30	10 - 32	15 - 32	4-20
No. 50	2 - 14	3 - 14	4-20
No. 100	0 - 6	0 - 6	<= 10
No. 200	0 - 2.3	0 - 2.3	<= 5

ADDITIONAL REQUIREMENTS - OPTIMIZED AGGREGATE GRADATION		
Percent by weight passing the 200 sieve		<= 2.3
OAG sum of volumetric percentages retained on No. 8, No. 16, and No. 30		>= 15
OAG sum of volumetric percentages retained on No. 30, No. 50, No. 100, and No. 200		24-34 ⁽¹⁾

⁽¹⁾ Increase to 40 percent if the concrete will be placed by a pump or by hand.

- (3) Concrete pavement repair and replacement must conform to the following:
 - Use the following slumps for the technique used:

SLIP-FORMED	NOT SLIP-FORMED
2.5 inches or less	4 inches or less
 - The contractor may increase the slump to a maximum of 9 inches for a mixture that contains a high range water reducer conforming to [501.2.5.3.3](#). Do not exceed the maximum w/cm allowed for the grade of concrete being used when a high range water reducer is in use.
- (4) Perform the slump tests for concrete according to [WTM T119](#).



2024 Spec Updates

602: Concrete Miscellaneous

- **Section**

- **Concrete Driveways, Surface Drains, and Rumble Strips** moved to 602 from 416
- Reason: 416 was revised for concrete pavement repair ONLY
- Result of discussion from Fast Track Task Force

- **Placing and Finishing Concrete (602.3.2.3)**

- Require **preplacement thickness measurements** for sidewalk and driveways

- **Joints (602.3.2.5)**

- Revised **jointing information** and **sidewalk joint interval**

- **Opening to Service (602.3.2.7)**

- Added **opening strength information** for sidewalks and driveways

- **Measurement (602.4)**

- Added **department measurement information** for concrete driveway, surface drains and rumble strips



2024 Spec Updates

710: General Concrete QMP

- **Concrete Mixes (710.4)**
 - Department may allow HES for contract convenience
 - Increase cement content up to 280 lb/CY
- **Corrective Action (710.5.7)**
 - Added two options for Optimized Aggregate Gradations (OAG)
 - Option A: Perform corrective action and re-evaluate
 - Option B: Submit an OAG mix design and restart control charts



2024 Spec Updates

715: QMP Concrete Pavement, Cast-in-Place Barrier and Structures

- **Class I Concrete Mixes (715.2.2)**

- Trial Batching reduced from **five** to **three**

715.2.2 Class I Concrete Mixes

715.2.2.1 Pavements and Cast-in-Place Barrier

715.2.2.1 *Revise to reduce number of cylinders and beams from trial batches. Changed requirement from 5 to 3.*

- (1) Use at least **3** pairs of cylinders from **3** separate trial batches to demonstrate the compressive strength of a mix design.
- (2) For concrete pavement, also demonstrate the flexural strength of the mix design using at least **3** pairs of beams from **3** separate trial batches.



- **Payment (715.5)**

- PWL from ASP 6 for November 2022 Let added to Standard Specs



SAM Testing

- SAM Testing is Paused for now...
 - Effective with 2024 Specs
 - No longer required to run SAM test in the field
 - Still needed for trial batching Class I Mix Designs
- SAM testing on carryover contracts STILL required
 - Concerns about Type IL cements and SAM
- Keep SAM Meters but don't purchase new meters
 - QC/QV Air Content tests can use SAM



Additional Special Provisions 6 (ASP 6) Changes



Additional Special Provisions 6 (ASP6) Changes

108 Prosecution and Progress

Add subsection 108.9.4.1 effective with the November 2023 letting:

108.9.4.1 Winter Suspension for Completion Date Contracts

- (1) The contractor may request a winter suspension for a completion date contract. If the department determines weather conditions do not allow for the completion of the remaining work, the department may approve the contractor's request and determine the start date of the winter suspension. The end date of the winter suspension is March 31 or a date mutually agreed upon by both parties. For multi-year contracts, the department will only consider winter suspension for the final year of the contract.
- (2) During winter suspension, store all materials in a manner that does not obstruct vehicular and pedestrian traffic and protect the materials from damage. Install traffic control and other safety devices necessary to

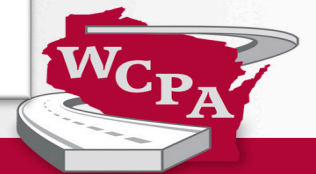
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108.9.4 Contract Time for Completion Date Contracts

~~(1) For completion date contracts, contract time begins with the start of work as specified in [108.2](#) and concludes on the specified completion date. Complete the contract on or before that date.~~

completion date, and the work has progressed as scheduled and would have been completed prior to the completion date, the cost of pre-suspension work will be paid as specified under 109.4.

- (3) For a winter suspension that begins prior to the contract completion date and the work has progressed as scheduled and would have been completed prior to the completion date, the engineer will extend contract time to correspond with the end of the winter suspension and liquidated damages will not be assessed during the winter suspension.
- (4) For a winter suspension that begins when liquidated damages are being assessed or when the work has not progressed as scheduled and would not have been completed prior to the completion date, the engineer will not extend contract time. Time will be suspended until the end of the winter suspension. Liquidated damages will not be assessed during the winter suspension and liquidated damages will resume at the end of the winter suspension.



Additional Special Provisions 6 (ASP6) Changes

WisDOT Test Procedure (VTP) C-102
 Effective with November 2023 Letting
 Revised Date: 09/13/2023

WisDOT Test Procedure for Concrete Preplacement Measurement for Thickness

390 Base Patching

390.4 Measurement

Replace entire section

- (1) The department will pay for measured quantities at the contract unit price under the following bid items: completed. M
- (2) The department will pay for measured quantities at the contract unit price under the following bid items: asphaltic pavement
- (3) The department will pay for measured quantities at the contract unit price under the following bid items: yard acceptable patch.

390.5 Payment

Replace entire section with the following effective with the November 2023 letting:

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

ITEM NUMBER	DESCRIPTION	UNIT
390.0100	Removing Pavement for Base Patching	CY
390.0201	Base Patching Asphaltic	TON
390.0305	Base Patching Concrete HES	CY
390.0405	Base Patching Concrete SHES	CY

- (2) Payment for Removing Pavement for Base Patching is full compensation for removing old pavement; for preparing the foundation and bringing up to grade. If the engineer orders the contractor to excavate yielding or unstable subgrade materials and backfill with suitable materials, the department will pay for that work with contract bid items or as agreed upon using 109.4.
- (3) Payment for Base Patching Asphaltic is full compensation for providing and compacting asphaltic mixture including asphaltic binder.
- (4) Payment for Base Patching Concrete HES and Base Patching Concrete SHES is full compensation for providing, curing, and protecting concrete. Payment also includes providing tie bars and dowel bars in unhardened concrete and steel within the patch. For tie bars and dowel bars provided in concrete not placed under the contract, the department will pay separately under the Drilled Tie Bars and Drilled Dowel Bars bid items as specified in 416.5.
- (5) Payment for Base Patching SHES also includes providing test data to the engineer as specified in 416.2.4.
- (6) The department will pay for sawing existing concrete pavement for removal under the Sawing Concrete bid item as specified in 690.5.

Additional Special Provisions 6 (ASP 6) Changes

- Prestress (Sec

(5) Furnish prestress use non-air-entrained up to 30 percent fly ash and slag only one source air-entraining aggregate conforming

310 Open Graded Base

310.2 Materials

Replace paragraph two with the following effective with the November 2023 letting:

(2) The contractor may substitute material conforming to the gradation requirements for crushed aggregate specified in Table 310-01 if that material conforms to the fracture requirements for open-graded crushed gravel specified in 301.2.4.5.

TABLE 310-01 COARSE AGGREGATE (% passing by weight)

AASHTO No. 67^[1]

SEIVE	COARSE AGGREGATE (% PASSING by WEIGHT) AASHTO No. 67
2-inch	-
1 1/2-inch	-
1-inch	100
3/4-inch	90 – 100
1/2-inch	-
3/8-inch	20 – 55
No. 4	0 – 10
No. 8	0 – 5
No. 16	-
No. 30	-
No. 50	-
No. 100	-
No. 200	<=1.5

^[1] Size according to AASHTO M43.

501.2.5.2 for air-entrained concrete. Use only coarse aggregate conforming to 310.2(2).

type girders may
 actor may replace
 for a combination of
 501.2.4.2.3. Use
 tment-approved
 y size No. 1 coarse

- ASP 6 to correct

503 Prestress

503.2.2 Con

Replace para

(5) Furnish prestress use non-air-entrained up to 30 percent fly ash and slag only one source air-entraining aggregate conforming to 310.2(2) for air-entrained concrete. Use only coarse aggregate conforming to 310.2(2).

use non-
 0 percent
 g. Ensure
 placement
 ng to



Specification Re-Organization





Specification Re-Organization

- All material-related specifications are re-organized into one Chapter (Chapter 7)
- Concrete materials location: **Part 700**
 - **ALL** Reorganized Specs are based on the **2024 Standard Specification** and the **Spring 2023 CMM**



Specification Re-Organization

- New Concrete Sections and Relevant Sections:

- 700: Materials
- 701: Aggregate
- **706: Concrete Mixtures**
- **707: Hydraulic Cement**
- **708: Supplementary Cementitious Materials**
- **709: Concrete Admixtures and Curing Materials**
- 710: Reinforcement



- Category I: Concrete Pavements
- Category II: Concrete Structures
- Category III: Cast-in-Place Concrete Barrier
- Category IV: Concrete Base
- Category V: Concrete Bridge Deck Overlay
- Category VI: Concrete Repair
- Category VII: Ancillary Concrete
- Category VIII: Miscellaneous Concrete
- Category IX: Precast Concrete
- Category X: Prestressed Concrete Girders



Specification Re-Organization

GENERAL SECTION LAYOUT

701.3.1.1 Pre-project Requirements

701.3.1.1.2 Material Property Requirements

701.3.1.1.3 Contractor Requirements

701.3.1.1.4 Department Requirements

701.3.1.2 Project Requirements

701.3.1.2.1 Conformance

701.3.1.2.2 Contractor Requirements

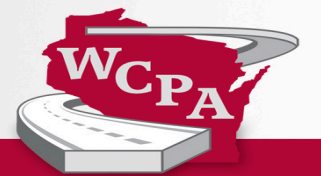
701.3.1.2.3 Department Requirements

701.3.1.2.4 Dispute Resolution

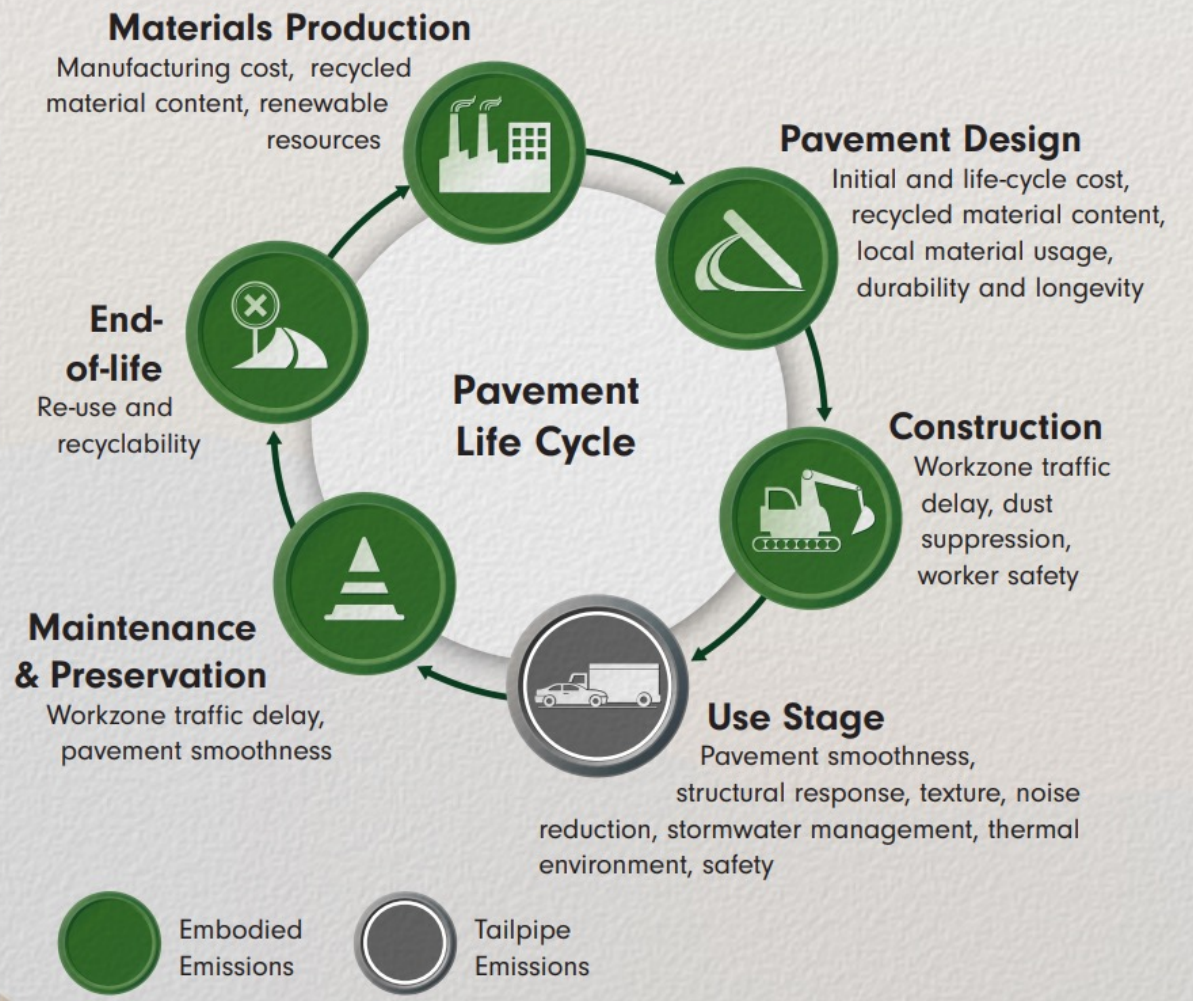
701.3.1.2.5 Payment



Sustainability in Concrete



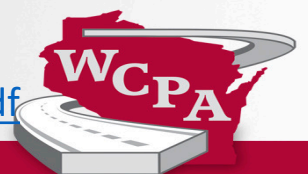
Sustainability in Concrete



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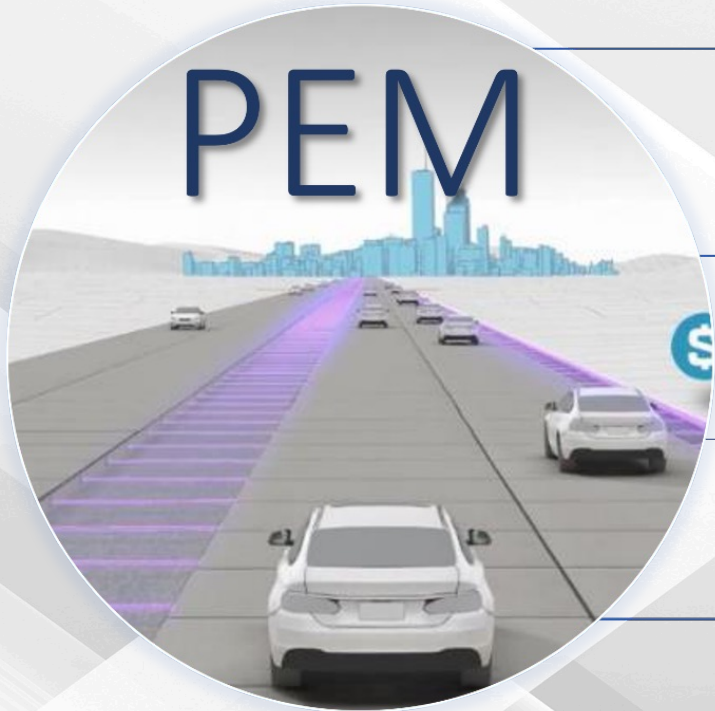
https://www.fhwa.dot.gov/infrastructure/climatechallenge/images/20211103_Emissions%20Infographic_508compl_toHPA.pdf

2024 WTBA Annual Conference



Materials - Optimizing Mix Designs

- Performance Engineered Mixtures (PEM)



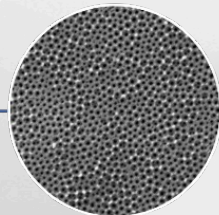
Optimized Gradations



Durable Matrix



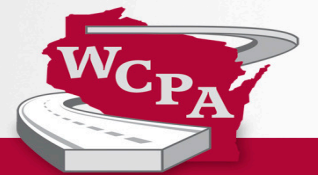
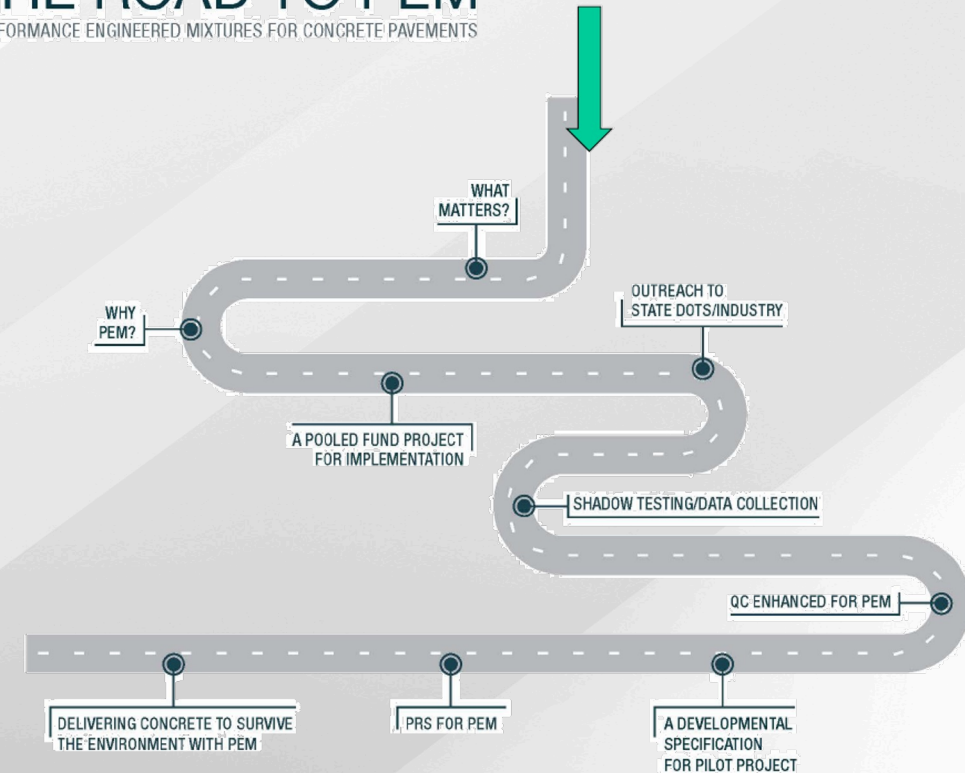
Greener Materials (PLC)



Recycled Materials

THE ROAD TO PEM

PERFORMANCE ENGINEERED MIXTURES FOR CONCRETE PAVEMENTS



ACPA's Top National Award for Sustainability
West Layton Avenue/CTH Y, Milwaukee County
(Milwaukee County DOT & Vinton Construction Company)

Concrete
Pavement's
Role in a
Sustainable,
Resilient Future

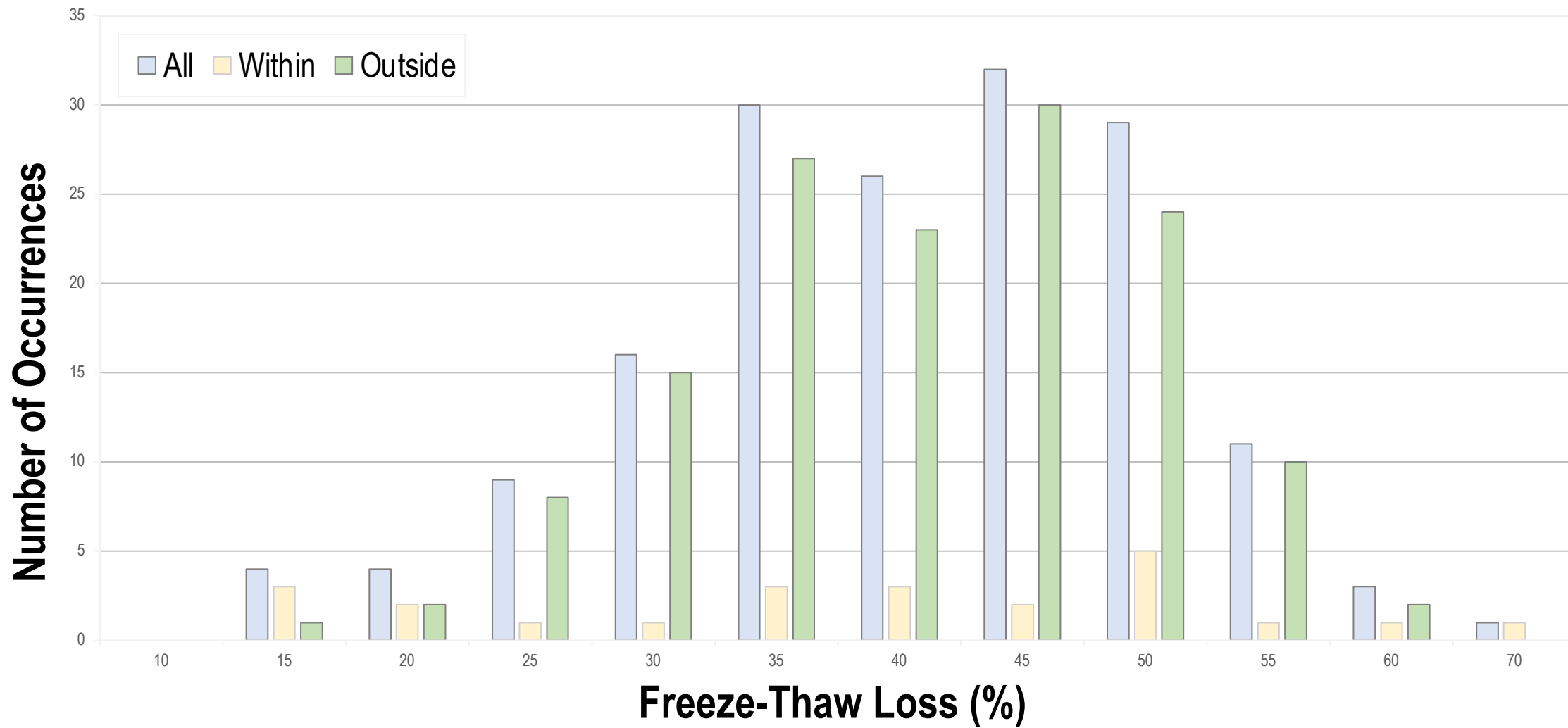


Cheers!

Recycled Concrete Study



Recycled Concrete: Freeze-Thaw Histogram



Recycled Concrete: Study Information

- 67 samples (recycled and reprocessed - within project limits) exceeded the 42% maximum percent loss for T103

^[2] No requirement for material taken from within the project limits. For material supplied from a source outside the project limits:

- LA wear maximum of 50 percent loss, by weight.
- Freeze thaw maximum of 42 percent loss, by weight.

- 40% of samples included in the study so far have been failing samples (2021, 2022, and 2023)
- 9 of the 23 (39%) within project limits samples exceeded the 42% maximum percent loss for T103
- 10 within project limits samples were collected in 2023
 - Recycled concrete round robin and repeatability study in Spring 2024



Approved Products List (APL)



Approved Products List

- APL website will be updated by end of this year
- Concrete related products will be updated annually
 - Deadlines for approval of each product will be specified along with WisDOT requirements
- Potential automated process for each APL using DocuSign

Prequalified Products

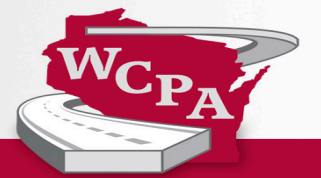
Utilize the following prequalified approved products that were **active on the bid closing date**, per the requirements of Standard Specification 101.2. Archived lists are available by sending an email to DOTProductSubmittal@dot.wi.gov. Include letting date and name of approved product list(s) required.

Portland Cement Concrete

- Concrete admixtures
- Portland cement suppliers
- Class F Fly Ash
- Cure and seal compound - non-traffic structural masonry
- Rapid set concrete repair materials
- Non-shrink grout
- High Performance Dowel Bars



Jointing

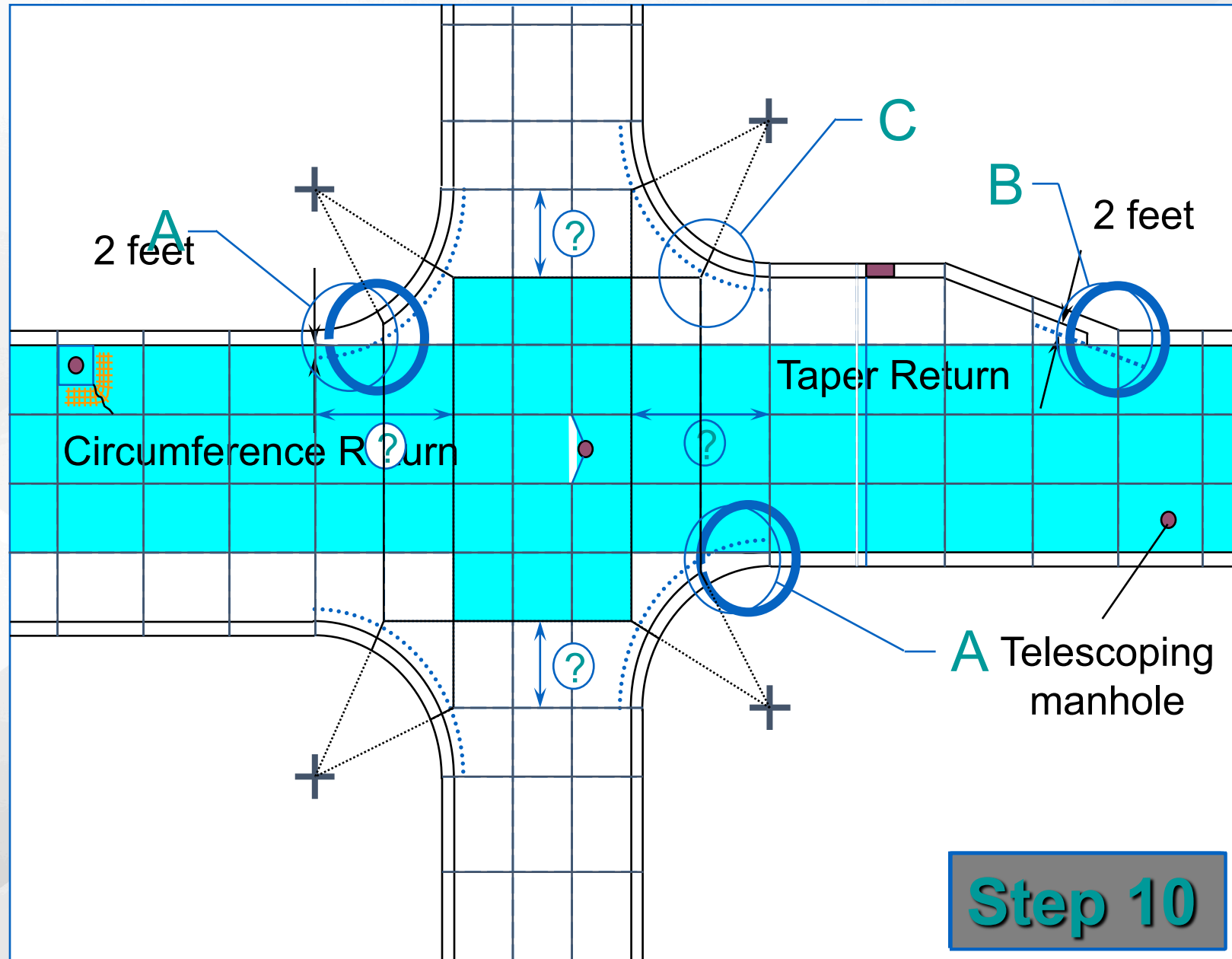


Jointing 101

Spacing Recommendations

- Keep ratio of transverse to longitudinal spacing at less than 1.5; ***square is best***
- Keep maximum spacing of transverse joints to 15 ft

Training Available – Please ask



Step 10

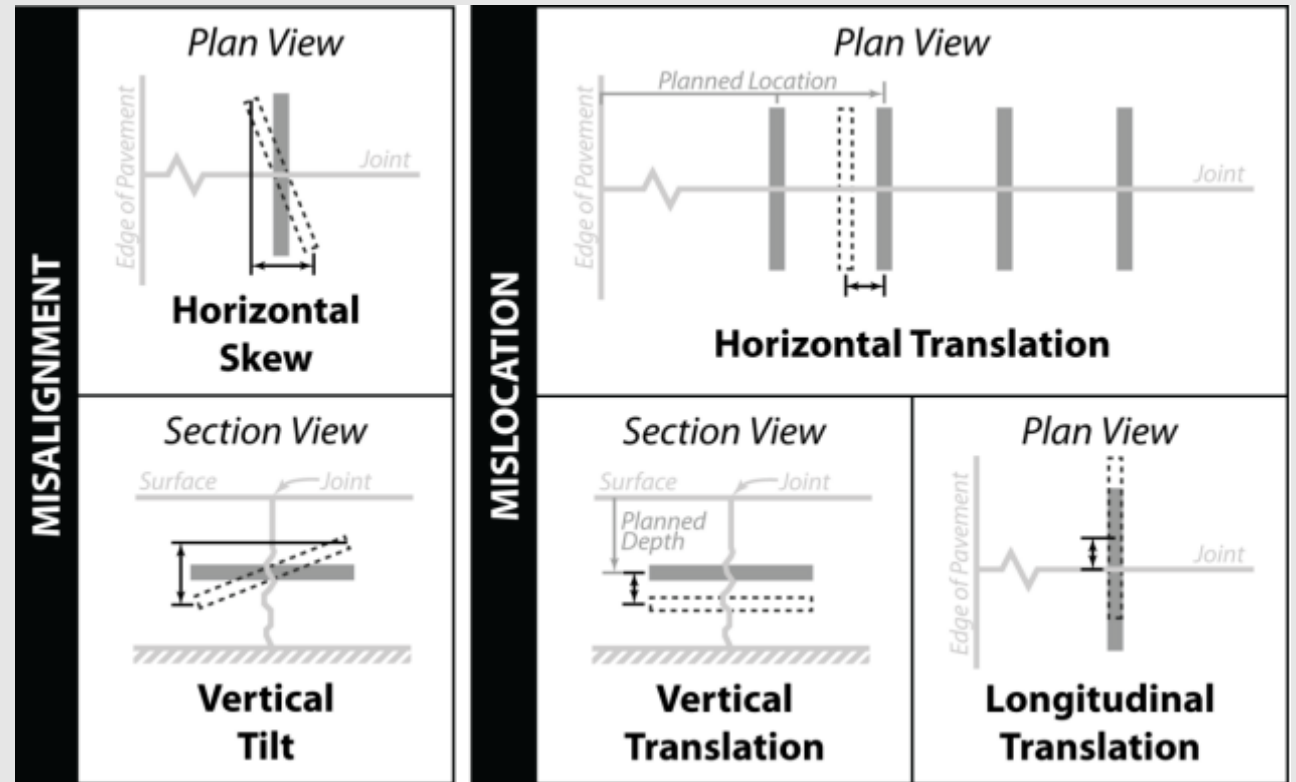


Dowel Bar Placement



Problems with Dowel Bar Placement

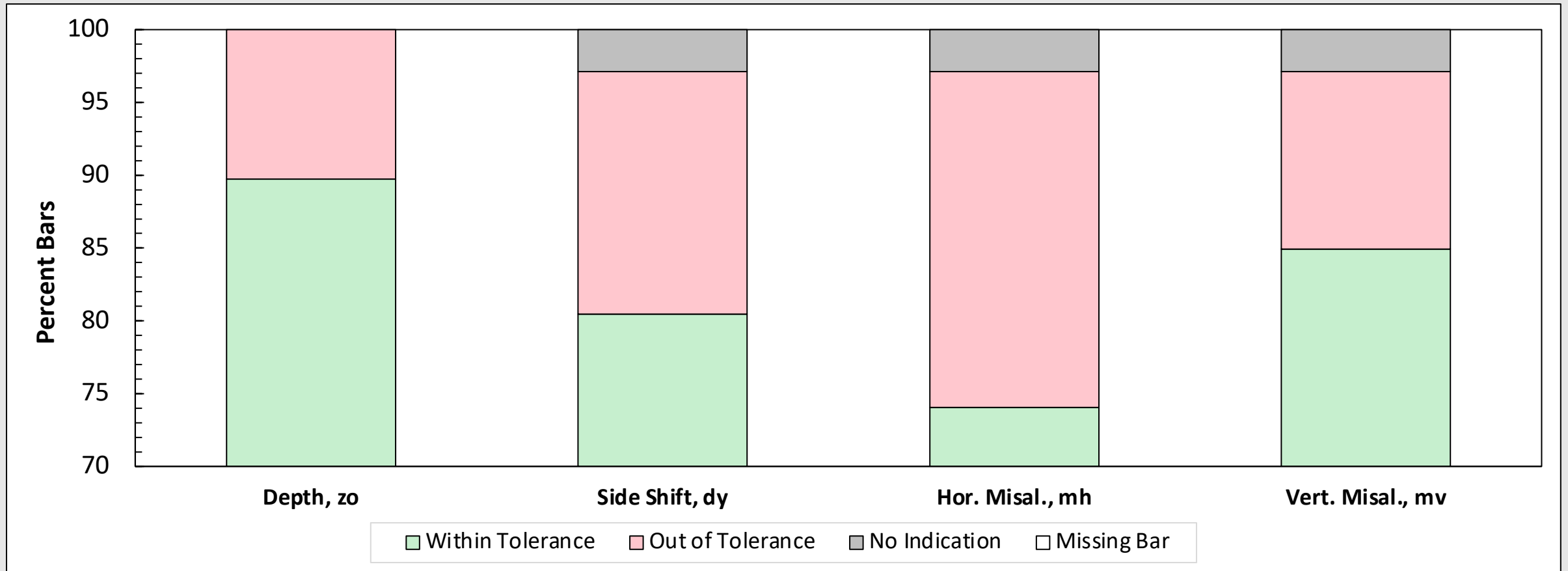
- If dowel placement deviates from the desired position, it is said to be **misaligned**
- Misalignment may result from:
 - **Misplacement:** initially placing the dowels in an incorrect position
 - **Displacement:** movement during the paving operation
 - Combination of both



FHWA 2007

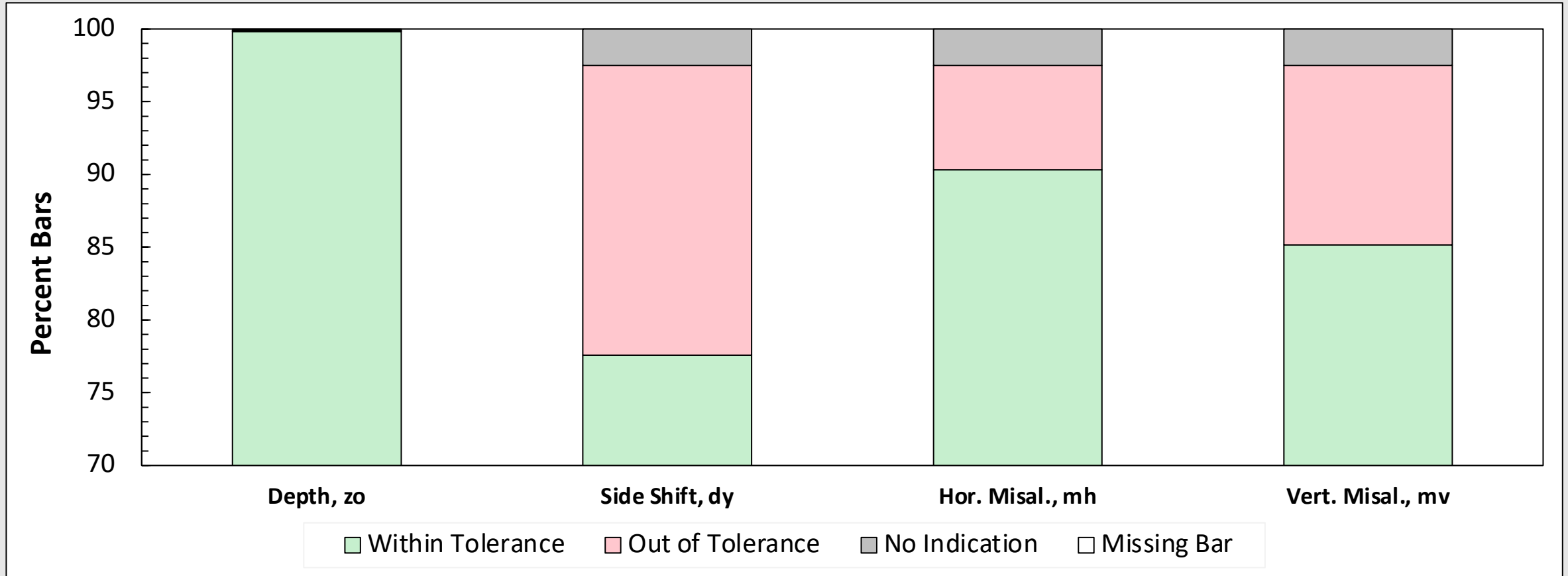
Example of Data Collected by BTS

Initial Visit



Example of Data Collected by BTS

Follow-up Visit



Dowel Bar Alignment Terms

- **Composite Misalignment (CM)**

- Total spatial deviation of dowel axis from the design orientation

$$\text{Composite Misalignment (CM)} = \sqrt{(\text{Horizontal Skew})^2 + (\text{Vertical Tilt})^2}$$

- **Joint Score (JS)**

- Value that represents the impact of all misaligned dowels in a single transverse joint

$$JS = \left(1 + \left(\frac{x}{x-n} \right) \sum_{i=1}^x W_i \right)$$

where:

W_i = weighting factor (ranging from 0 to 10, depending on CM magnitude) for dowel i

x = number of dowels in a single joint

n = number of dowels excluded from calculation of JS (due to measurement interference, proximity to tie bars, etc.)



Dowel Bar Alignment Terms

- **Critical Joint Score (JScritical)**

- Value of the Joint Score above which the joint has a high probability of restraining joint opening and closing to an extent that may impair long-term pavement performance

$$\text{Critical Joint Score (JScritical)} = C * 15 * \frac{\text{Joint Width (ft)}}{12}$$

where:

C = Optional adjustment factor for local conditions (e.g., climate, panel length, slab-subbase restraint, local experience, etc.)



Example of Data Collected by BTS

- Based on Joint Score -

Visit	Initial Visit	Follow-up
Number of Joints	26	100
Passing Joints	16	98
Failing Joints	10	2



Testing by BTS in 2023

Project Visit	Joints Passing (%)
Project 1	96%
Project 2	90%
Project 3 (Example)	90%



Upcoming Data from WHRP Research

Site Information						
County	Route	Object ID	Direction	Baskets or DBI	Test Date	Number of Joints Tested
CHIPPEWA	178	7151	SB	Baskets	10/16/2023	129
			NB	Baskets		121
EAU CLAIRE	93	7109	NB	Baskets	10/17/2023	113
	53	4994		DBI		120
WOOD	10	6209	EB	DBI	10/18/2023	99
		6216	WB	DBI		110
FOND DU LAC	151	6150	NB	DBI	10/19/2023	111
			SB	DBI		110
JEFFERSON	12	5089	WB	Baskets	10/24/2023	100
			EB	Baskets		92
ROCK	51	5318	NB	Baskets	10/25/2023	218
			WB	Baskets		

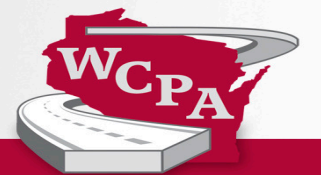


Dowel Bar Placement Summary

- MIT scan results show that there is some room for improvement
- BTS will have snapshot of overall dowel bar alignment quality after completion of WHRP project
- Concrete Technical Committee will be looking into future policy based on data to determine next steps



Concrete Overlays



GUIDE TO CONCRETE OVERLAYS

FOURTH EDITION



IOWA STATE UNIVERSITY
Institute for Transportation

OCTOBER 2021

National Concrete Pavement
Technology Center

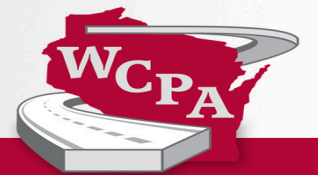

Concrete Overlays – Coming 2025!

WisDOT's Balanced Pavement Network

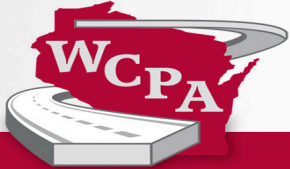
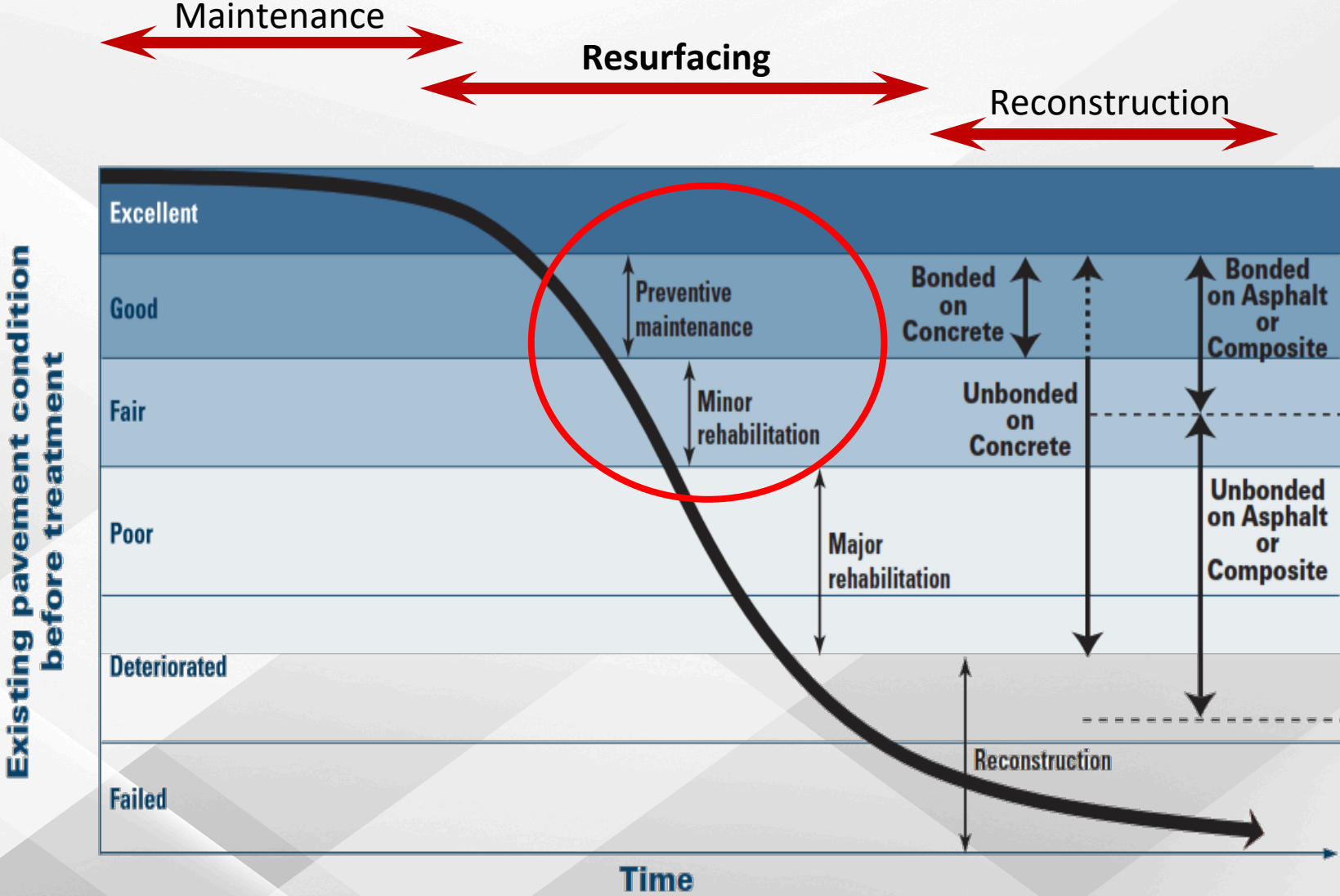
- Pilot projects selected for 2025 and 2026 paving season

Overlay Design Process

- Pavement Evaluation
- Determine Overlay Type
- Determine Design Life and Traffic
- Use Pavement Design Software ([PavementDesigner.org](https://www.pavementdesigner.org))
- Consider Additional Design Features
- Consider Construction Process
- Create Construction Documents



Concrete Overlays – Evaluation Informs Design

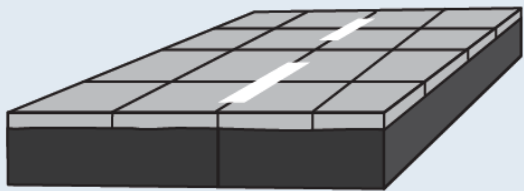


Overlay Type Selection

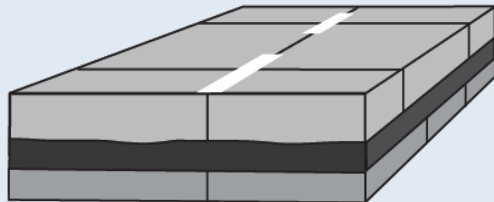
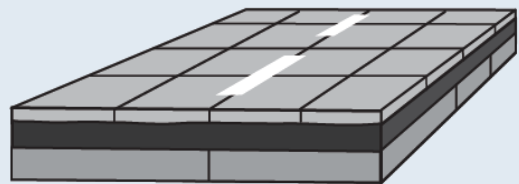
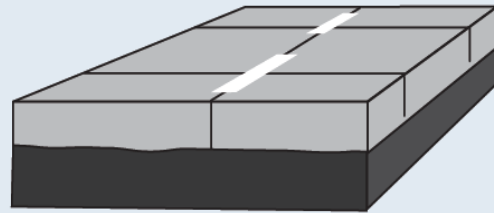
Concrete on Asphalt

Concrete on asphalt (COA) overlays can be designed to address a broad range of existing pavement conditions on both composite and full-depth asphalt pavements. Both bonded (COA-B) and unbonded (COA-U) options enable designs to cost-effectively match the condition of the existing asphalt—from deteriorated to good—as well as geometric parameters.

COA-B (Full Depth and Composite)



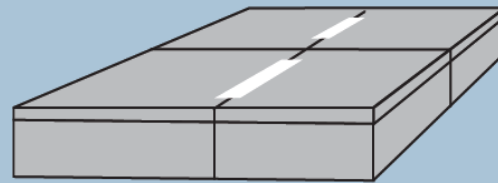
COA-U (Full Depth and Composite)



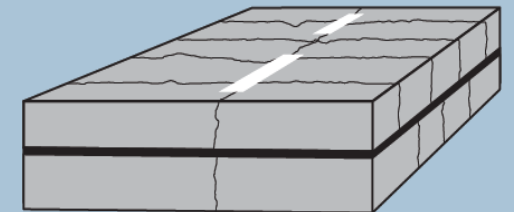
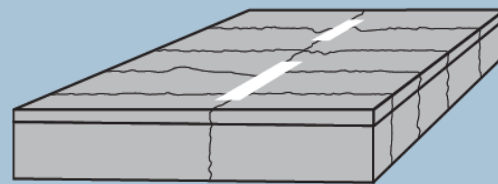
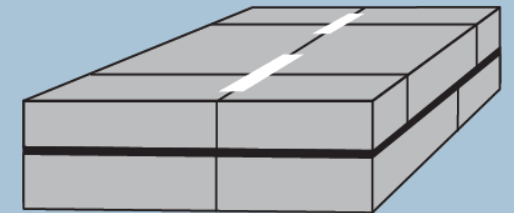
Concrete on Concrete

Concrete on concrete (COC) overlays can be designed for applications on both existing jointed plain concrete pavement (JPCP) and continuously reinforced concrete pavement (CRCP). The predominance of COC overlay designs are unbonded (COC-U) systems; however, bonded (COC-B) applications can be successful, provided the existing pavement is in good condition.

COC-B (JPCP and CRCP)



COC-U (JPCP and CRCP)



Concrete Overlays

Overlay Workshop – Phase 1

- Concrete Overlay Design Training (November 8, 2023)

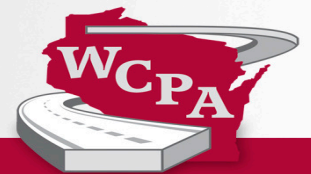
Topics Covered:

1. Project evaluation and selection
2. Design details and procedures
3. Construction and maintenance of traffic
4. Recent case studies that exemplify project selection and construction for various overlay types
5. Current information on geotextile separation layers and fiber reinforcement

Overlay Workshop – Phase 2

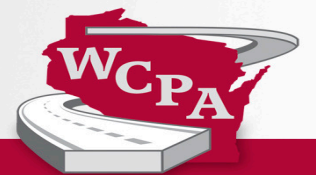
- Concrete Overlay Construction Training (Fall 2024)

Additional Design & Construction Training Available



Concrete Pavement Inspection Training

- Southwest Region (Madison)
 - Monday, April 1, 2024
- Northwest Region (Spooner)
 - Tuesday, April 9, 2024
- Southeast Region (Waukesha)
 - TBD
- Collaborative Effort with WisDOT
- In-Person Training in 3 Regions each year



WisDOT Priorities

Spec Re-org

Task Forces

- Fast Track
- Concrete Strength
- Aggregate Testing
- Concrete Lot/Sublot Testing
 - CY vs SY vs LF





Thursday Conference Agenda

February 15, 2024

5 PDH

- 7:30 AM Check - In & Exhibitor Showcase
- 8:30 AM Welcome & Introductions
Jackie Spoor - WCPA President
- 8:45 AM WisDOT – Address from the Secretary’s Office: Benefit of Competition, Mix of Fixes
Joel Nilsestuen - Assistant Deputy Secretary, WisDOT
- 9:15 AM Sustainability (WisDOT Outlook with Concrete and Heavy Highways)
David Hubbard - WisDOT Business Relationship Manager
- 9:45 AM Break & Exhibitor Showcase
- 10:00 AM FHWA Updates
Mike Praul, PE - FHWA Senior Concrete Engineer
- 10:45 AM LCCA/Mix of Fixes/Overlays
Leif Wathne, PE - National Concrete Pavement Tech Center ISU Associate Director
- 11:15 AM Reduced Carbon Concrete Consortium (RC3)
Dr. Thomas Van Dam, PE - Principal at Wiss, Janney, Elstner Associates, Inc.
- 12:00 PM LUNCH
- 12:45 PM Celebrating Wisconsin’s Award Winning Projects
Jackie Spoor - WCPA President
Erik Lyngdal, PE - WisDOT Chief Materials Engineer
- 1:15 PM HTCP Update / QMP Award Winner
Jodi Pluemer - HTCP Director
- 1:30 PM Break & Exhibitor Showcase

	CONSTRUCTION / DESIGN		MUNICIPAL
2:00 PM - ADA & PROWAG in WI		Maintenance/Rehab & Panel Discussion	
2:45 PM Jackie Spoor - WCPA President		Kevin McMullen, PE - WCPA Vice President	
Leslie Ashauer - WCPA Director of Engineering		Jackie Spoor - WCPA President	
3:00 PM - Jointing		Asset Management Panel	
3:45 PM Eric Ferrebee, PE - ACPA Senior Director of Technical Services		Brian Field - Dodge County Commissioner	
		Brad Werner - McMahon Associates Vice President	
		Ron Chamberland - Business Development Manager at SEH	
4:00 PM - Overlays in WI - Lesson’s Learned		ARIP & Overweight Design	
4:45 PM Dan King, PE - CP Tech Center Research Engineer		Merrill Mechler-Hickson - Local Program & Policy Chief, Local Programs & Finance	

- 4:45 PM Break & Exhibitor Showcase
- 5:30 PM WisDOT Safety Update
Gretchen Bockenbauer - UW-Platteville Program Coordinator of Construction Management
PPE Runway Show
- 6:00 PM WCPA’s Wisconsin Tailgate Dinner, Scholarship Recognition
Jackie Spoor - WCPA President
- 8:00 PM - WCPA Hospitality & Networking
midnight

REGISTER NOW!

WCPA Annual Conference

February 15th & 16th

Friday Conference Agenda



February 16, 2024

3 PDH

- 7:00 AM Hot Breakfast Buffet
- 7:00 AM Check - In for New Arrivals & Exhibitor Showcase
- 8:00 AM EPDs & WAP Sustainability
Eric Ferrebee, PE - ACPA Senior Director of Technical Services
- 9:00 AM WisDOT—What’s New With WisDOT
Mark Finnell, PE - Behnke Materials Engineering, LLC
Aleksandra Graff, PhD, PE - WisDOT Concrete Engineer
Peter Kemp, PE - WisDOT Pavement Unit Supervisor
Tirupan Mandal, PhD, PE - WisDOT Concrete Materials Supervisor and Research Program Chair
- 10:00 AM Break & Exhibitor Showcase
- 10:15AM MN Road Research & History of State’s Pavements
Matt Zeller, PE - Concrete Paving Association of MN Executive Director
Maria Masten, PE - MNDOT Concrete Engineer
- 11:15 PM History of Wisconsin Pavements
Kevin McMullen, PE - WCPA Vice President
- 12:00 PM Adjourn



Scan Me

Thank you!

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