



APPROVED MINUTES

September 15, 2022 Standards Committee Meeting

October 27, 2022

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the September 15, 2022 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Novak, sitting in for Mr. Pankow, at 09:02 a.m. on September 15, 2022, which was held virtually via *Teams* (Microsoft application). The meeting was adjourned at 9:59 a.m.

The following committee members were in attendance:

Joseph Novak*, Chairman, Director, Construction Management
Anne Rearick, Engineering and Asset Management
Dave Boruff, Traffic Engineering
Jim Reilman, Division of Materials and Tests
John Wooden, Division of Contract Administration
Patrick Patterson**, Construction Management
Nick Cosenza***, Pavement Engineering
Kurt Pelz, Construction Technical Support
Mark Orton, Highway Engineering
Mike Koch, District Construction, Fort Wayne District
Peter White, Bridge Engineering

*Proxy for Gregory Pankow

**Proxy for Joseph Novak

***Proxy for Kumar Dave

Also, presence of the following throughout the meeting was captured by the *Microsoft Teams*:

Awwad, Nathan, INDOT
Bazlamit, Subhi M, INDOT
Beeson, Matthew, INDOT
Blanchard, Jacob, INDOT
Bowen, John, INDY.gov
Corrice, Zachariah, INDOT

Hunter, Jeremy, INDOT
Jacobs, David L, INDOT
Kachler, Mischa, INDOT
Leckie, John, IRMCA
McNutt, Donald, (guest)
Mouser, Elizabeth, INDOT

Distler, Jeff, Prestress Services Industries	Nelson, Mike, INDOT
Duncan, Steve, INDOT	Osborn, Dan, ICI
Duncan, Thomas, FHWA	Podorvanova, Lana, INDOT
Fisher, Steve, INDOT	Ritter, John, INDOT
Hailat, Mahmoud, INDOT	Smutzer, Katherine, INDOT
Harris, Tom, INDOT	Thornton, Donald, INDOT
Hauser, Derrick, INDOT	Trammell, Scott, INDOT

The following items were discussed:

A. GENERAL BUSINESS ITEMS

Approval of the Minutes from the [August 18, 2022](#) meeting

Mr. Novak requested a motion to approve the Minutes from the August 18, 2022 meeting.

Motion: Mr. Orton
 Second: Mr. Kurt
 Ayes: 9
 Nays: 0

ACTION: PASSED AS SUBMITTED

B. CONCEPTUAL PROPOSAL ITEMS

[Preparation of the 2024 SS \(Division 400\) for publishing \(K. Pelz\)](#)

DISCUSSION:

It was determined that we don't have a need for the cutback asphalts in construction, but the QPA linked has 902 referenced for materials.

Post-meeting note: Mr. Reilman plans to propose changes to section 902, Cutback Asphalt, for the October 20, 2022 SC meeting. These changes, if approved, will result in editorial change shown in 101:

SC ~~slow-curing asphalt~~ seal coat

C. STANDARD SPECIFICATIONS, DRAWINGS, AND SPECIAL PROVISIONS ITEMS

[Item No. 1 \(2022 SS\)](#) [Mr. Novak](#) [pg. 5](#)

2022 Standard Specifications:

801.10 Temporary Traffic Barriers

ACTION: PASSED AS SUBMITTED

[Item No. 2 \(2022 SS\)](#) [Mr. Reilman](#) [pg. 9](#)

2022 Standard Specifications:

502.04(a) Portland Cement Concrete

ACTION: PASSED AS SUBMITTED

[Item No. 3 \(2022 SS\)](#) [Mr. Reilman](#) [pg. 13](#)

2022 Standard Specifications:

503.02	Materials
609.02	Materials
703.02	Materials
910.01	Reinforcing Bars, Dowel Bars and WWR

ACTION: PASSED AS SUBMITTED

[Item No. 4 \(2022 SS\)](#) [Mr. Reilman](#) [pg. 19](#)

2022 Standard Specifications:

707.04	Steel and Concrete Requirements
707.06	Placing and Finishing Concrete
707.12	Basis of Payment

ACTION: PASSED AS REVISED

[Item No. 5 \(2022 SS\)](#) [Mr. Reilman](#) [pg. 27](#)

Recurring Special Provision:

738-B-297	WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS
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ACTION: PASSED AS SUBMITTED

[Item No. 6 \(2022 SS\)](#) [Mr. Reilman](#) [pg. 49](#)

2022 Standard Specifications:

904.04	Riprap
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ACTION: PASSED AS SUBMITTED

[Item No. 7 \(2022 SS\)](#) [Mr. Reilman](#) [pg. 53](#)

Recurring Special Provision:

620-R-483

SOUND BARRIER SYSTEMS

ACTION:

PASSED AS SUBMITTED

[Item No. 8 \(2022 SS\)](#)

[Mr. Reilman](#)

[pg. 58](#)

2022 Standard Specifications:

702.05

Proportioning

ACTION:

PASSED AS SUBMITTED

cc: Committee Members
FHWA
ICI

APPROVED MINUTES

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: When Type 1 and 3 temporary barrier wall are installed the use of J-J hook connectors need clarification of desired connection installation. There is potential of greater deflection of the barrier wall when struck if the J-J hook connection is not installed with the J-J hooks fully engaged with each other.

PROPOSED SOLUTION: Include Spec language that describes desired outcome of the installation of the J-J hook connection by adding that once the J-J hook connection is made, the wall will need to be pulled until the J-J hook connection is fully engaged.

APPLICABLE STANDARD SPECIFICATIONS: 801.10(b)

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: NA

APPLICABLE RECURRING SPECIAL PROVISIONS: 801-T-207

PAY ITEMS AFFECTED: Temporary Traffic Barrier, _____ type

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Propose to add to existing RSP 801-T-207 and keep the same BFU.

IMPACT ANALYSIS (attach report): Yes

Submitted By: Joseph Novak, P.E.
Cel: (317) 501-7805

Title: State Construction Engineer

Division: N758 – Construction Management

E-mail: jnovak@indot.in.gov

Date: 07/22/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Qualified Products List (QPL)? No

Will this proposal improve:

Construction costs? No

Construction time? No

Customer satisfaction? No

Congestion/travel time? No

Ride quality? No

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? Yes

For construction workers? Yes

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? No

Design process? No

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? NA

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? Yes

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO STANDARD SPECIFICATIONS

SECTION 801 – TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS

801.10 Temporary Traffic Barriers

The Standard Specifications are revised as follows:

SECTION 801, BEGIN LINE 418, DELETE AND INSERT AS FOLLOWS:

(b) Connection

Type 1 and type 3 barrier sections shall be connected as follows:

1. Smooth bar hooks

- 1a. The adjacent barrier sections shall be placed end to end, with sufficient overlapping of the smooth bar hooks to allow placement of the connecting bolt or threaded rod and the top spacer.
- 2b. The adjacent barrier sections shall then be moved in opposite directions for a sufficient distance to develop the maximum contact between the smooth bar hooks and the connecting bolt or threaded rod.
- 3c. The bottom spacer and nut shall then be placed as shown on the plans. The nut shall be sufficiently tightened to eliminate all gaps between the adjacent bolt heads, spacers, nuts, and washers which form the connection.

2. J-J Hook

- a. *The adjacent barrier sections shall be placed ~~per~~in accordance with the manufacturer's recommendations such that the J-J Hooks are engaged.*
- b. *The adjacent barrier sections shall then be moved in opposite directions for a sufficient distance to develop the maximum separation between the barrier sections.*

COMMENTS AND ACTION

801.10 Temporary Traffic Barriers

DISCUSSION:

This item was introduced by Mr. Patterson, sitting in as proxy for Mr. Novak, and was presented by Mr. Ritter who stated that when Type 1 and 3 temporary barrier wall are installed, the use of J-J Hook connectors need clarification of the desired connection installation. There is potential of greater deflection of the barrier wall when struck if the J-J hook connection is not installed with the J-J hooks fully engaged with each other.

Mr. Ritter proposed to include Spec language that describes the desired outcome of the installation of the J-J Hook connection by adding that once the J-J Hook connection is made, the wall will need to be pulled until the J-J Hook connection is fully engaged. Minor editorial revisions are as shown.

There was no further discussion and this item passed as submitted.

<p>Motion: Mr. Patterson Second: Mr. Boruff Ayes: 10 Nays: 0 FHWA Approval: YES</p>	<p>Action:</p> <p><input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn</p>
<p>2022 Standard Specifications Sections referenced and/or affected: 801.10 pg. 872.</p> <p>Recurring Special Provisions or Plan Details: 801-T-207 TEMPORARY TRAFFIC BARRIERS</p> <p>Standard Drawing affected: NONE</p> <p>Design Manual Sections affected: NONE</p> <p>GIFE Sections cross-references: NONE</p>	<p><input type="checkbox"/> 2024 Standard Specifications Revise Pay Items List</p> <p><input type="checkbox"/> Create RSP (No. __) Effective:</p> <p><input checked="" type="checkbox"/> Revise RSP (No. <u>801-T-207</u>) Effective: <u>March 1, 2023</u></p> <p><input type="checkbox"/> Standard Drawing Effective:</p> <p><input type="checkbox"/> Create RPD (No. __) Effective:</p> <p><input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update</p>

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Slump requirements for slip formed concrete were inadvertently deleted from 502.

PROPOSED SOLUTION: Reinstate slump requirements for slip formed concrete to what they used to be (1.25 - 3 in).

APPLICABLE STANDARD SPECIFICATIONS: 502.04

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 502 RSP or revise 702-R-739

PAY ITEMS AFFECTED: none

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: Abul Mazumder, Mike Nelson, Jim Reilman

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Required for all contracts except mowing, herbicide, sweeping, light bulb replacement, or tree removal/trimming.

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 8/18/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? Yes

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? N/A

Construction time? N/A

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? N/A

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2022 STANDARD SPECIFICATIONS

SECTION 502 – PORTLAND CEMENT CONCRETE PAVEMENT, PCCP

502.04(a) Portland Cement Concrete

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 502, BEGIN LINE 97, INSERT AS FOLLOWS:

Field Acceptance Properties:

Minimum water/cementitious ratio.....	0.320 ^B
Maximum water/cementitious ratio.....	0.450 ^B
Slump, <i>formed</i>	2 to 6 in.
<i>Slump, slipformed</i>	1.25 to 3 in.
Air Content.....	5.0% to 8.0%
Minimum modulus of rupture.....	570 psi at 7 days ^C
Relative Yield	0.98 to 1.02

^A The target cement content during production shall not be adjusted from the value stated on the CMDP.

^B The water cementitious ratio during production shall not deviate more than 0.020 from the target stated in the CMDP and shall not fall outside the limits above.

^C Beams shall be standard cured in a water tank in accordance with AASHTO T 23 and 505.01(a). The water does not need to be saturated with calcium hydroxide. Minimum flexural strength for opening to traffic shall be in accordance with 506.12.

Class C concrete in accordance with 702 using Class AP coarse aggregate may be substituted in PCCP.

Blended portland pozzolan cements, fly ash, or slag cement may only be incorporated in the concrete mix when the ambient temperature is above 50°F during the entire placement period. If type IP, type IP-A, type IS or type IS-A cements are to be used, the minimum portland cement content shall be increased to 598 lb/cu yd. The use of fly ash or slag cement will not be allowed when blended cement types IP, IP-A, IS, or IS-A are used.

COMMENTS AND ACTION

502.04(a) Portland Cement Concrete

DISCUSSION:

This item was introduced and presented by Mr. Reilman who stated that slump requirements for slip formed concrete were inadvertently deleted from 502.

Mr. Reilman proposed to reinstate slump requirements for slip formed concrete, 1.25 in. to 3 in., as they used to be.

Mr. Koch mentioned that ultimately, we are looking for performance, and asked if defining formed and slip-formed adds value. Mr. Nelson responded that we don't have a true performance-based spec and we would not want to state a range of 1.25" to 6" for all concrete. That would effectively be condoning slumps in ranges that don't work for some applications and prefers to keep the slipped/non-slipped distinction.

There was no further discussion and this item passed as submitted.

	<u>Action:</u>
Motion: Mr. Reilman Second: Mr. Boruff Ayes: 10 Nays: 0 FHWA Approval: YES	<input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 502.04 pg. 424. Recurring Special Provisions or Plan Details: 702-R-739 STRUCTURAL CONCRETE AND USE OF OPTIMIZED AGGREGATE GRADATION IN CONCRETE	<input checked="" type="checkbox"/> 2024 Standard Specifications Revise Pay Items List <input type="checkbox"/> Create RSP (No. __) Effective: <input checked="" type="checkbox"/> Revise RSP (No. 702-R-739) Effective: <u>March 1, 2023</u> <input type="checkbox"/> Standard Drawing Effective: <input type="checkbox"/> Create RPD (No. __) Effective: <input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update
Standard Drawing affected: NONE	
Design Manual Sections affected: NONE	
GIFE Sections cross-references: NONE	

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The use of reinforcing bar chairs and supports made of materials other than steel are not performing as intended. The Department is aware of many instances of poor concrete consolidation around reinforcing bars and bar support devices buckling under the weight of the reinforcing mats.

PROPOSED SOLUTION: Revise the Standard Specifications as shown to require reinforcing bar chairs and supports to be manufactured from steel.

APPLICABLE STANDARD SPECIFICATIONS: 503.02, 609.02, 703.02, 910.01

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: none

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: add to 703-R-724

PAY ITEMS AFFECTED: none

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ad hoc: Mike Koch, Michael Nelson, Jim Reilman

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Required for all contracts except mowing, herbicide, sweeping, light bulb replacement, or tree removal/trimming.

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 8/18/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? N/A

Construction time? Yes

Customer satisfaction? Yes

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? N/A

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2022 STANDARD SPECIFICATIONS

- SECTION 503 – PCCP JOINTS
- 503.02 Materials
- SECTION 609 – REINFORCED CONCRETE BRIDGE APPROACHES
- 609.02 Materials
- SECTION 703 – REINFORCING BARS
- 703.02 Materials
- SECTION 910 – METAL MATERIALS
- 910.01 Reinforcing Bars, Dowel Bars and WWR

The Standard Specifications are revised as follows:

SECTION 503, BEGIN LINE 9, DELETE AND INSERT AS FOLLOWS:

503.02 Materials

Materials shall be in accordance with the following:

Chemical Anchor System	901.05
Concrete, Class A.....	702
Dowel Bars	910.01(b)10
Epoxy Coated Reinforcing Bars	910.01(b)9
Hot Poured Joint Sealant	906.02(a)2
Joint Filler.....	906.01
Joint Materials.....	906
PCC Sealer/Healers	901.06
Reinforcing Bars	910.01
Support Devices	910.01(b)911
Threaded Tie Bar Assembly	910.01(b)2

SECTION 609, BEGIN LINE 10, DELETE AND INSERT AS FOLLOWS:

609.02 Materials

Materials shall be in accordance with the following:

Coarse Aggregate, Class B or Higher, Size No. 8	904.03
Coarse Aggregate, Class D or Higher, Size No. 53	904.03
Concrete, Class A.....	702
Curing Materials	912.01
Geotextile for Pavement and Subgrade.....	918.02
Joint Materials.....	906.02(a)1
Reinforcing Bars, Epoxy Coated	910.01
Support Devices	910.01(b)911
Threaded Tie Bar Assembly	910.01(b)2

SECTION 703, BEGIN LINE 9, DELETE AND INSERT AS FOLLOWS:

703.02 Materials

Materials shall be in accordance with the following:

Reinforcing Bars, Plain or Epoxy Coated.....	910.01
Reinforcing Bar Splicing System	910.01(b)3
Support Devices.....	910.01(b)911
Threaded Tie Bar Assembly.....	910.01(b)2

REVISION TO 2022 STANDARD SPECIFICATIONS

SECTION 503 – PCCP JOINTS

503.02 Materials

SECTION 609 – REINFORCED CONCRETE BRIDGE APPROACHES

609.02 Materials

SECTION 703 – REINFORCING BARS

703.02 Materials

SECTION 910 – METAL MATERIALS

910.01 Reinforcing Bars, Dowel Bars and WWR

SECTION 910, BEGIN LINE 98, DELETE AND INSERT AS FOLLOWS:

9. Epoxy Coated Reinforcing Bars

Epoxy coated reinforcing bars shall be furnished by selecting bars coated from an applicator's plant on the QPL of Reinforcing Bar and WWR Epoxy Coaters and in accordance with ITM 301. The epoxy coating material shall be selected from the QPL of Epoxy Coating Materials.

Epoxy coated reinforcing bars shall be in accordance with ASTM A775, except as follows.

- a. the bars shall be in accordance with 910.01(b)1;
- b. the coating color shall contrast with the color of iron oxide;
- c. tensile and bend tests shall be performed on the bars. If an examination of the bend test specimen suggests the need, the adhesion of the coating shall be checked by subjecting additional specimens to the 120° bend test. Hairline cracks without bond loss will be acceptable provided there are not more than two and the length of either crack does not exceed 1/4 in. The average coating thickness shall be 9 to 14 mils after cure. The thickness measurements shall be made in accordance with ASTM D7091. The coating thickness shall be an average based on 12 individual readings. No specific correction for the base preparation process shall be applied to the thickness measurements;
- d. epoxy coated reinforcing bars furnished by coaters on the QPL of Reinforcing Bar and WWR Epoxy Coaters shall be accompanied by the types of certifications specified in ITM 301 and in accordance with 916;
- e. repair and handling procedures shall be in accordance with 703.04. The patching material shall be in accordance with ASTM D3963.

~~Epoxy coated support devices for epoxy coated reinforcing bars shall be in accordance with ASTM A775, except as follows:~~

- ~~a. the steel shall be in accordance with 910.01(b)1;~~

REVISION TO 2022 STANDARD SPECIFICATIONS

SECTION 503 – PCCP JOINTS

503.02 Materials

SECTION 609 – REINFORCED CONCRETE BRIDGE APPROACHES

609.02 Materials

SECTION 703 – REINFORCING BARS

703.02 Materials

SECTION 910 – METAL MATERIALS

910.01 Reinforcing Bars, Dowel Bars and WWR

- ~~b. the coating color shall contrast with the color of iron oxide;~~
- ~~c. the coating thickness shall be 6 to 20 mils after cure. The thickness measurements shall be made in accordance with ASTM D7091.~~

10. Dowel Bars

Dowel bars shall be plain billet steel in accordance with ASTM A615, grade 40 or higher, except that the bend test and elongation requirements will not apply. The dowel bar area and weight for the nominal bar diameter shall be as follows.

Nominal Bar Diameter, in.	Cross Sectional Area, sq in.	Weight, lb/ft
1	0.79	2.670
1 1/4	1.23	4.172
1 1/2	1.77	6.008

Dowel bars shall be coated with an epoxy coating material selected from the QPL of Epoxy Coating Materials. The coating thickness after cure shall be a minimum of 7 mils. Dowel bars shall not have burring or other deformation restricting slippage in concrete. Dowel bar ends shall be saw cut. Chips from the cutting operation shall be removed from coated bars.

Dowel bars shall be furnished by selecting bars made by a coater and manufacturer on the QPL of Reinforcing Bar and WWR Epoxy Coaters and in accordance with ITM 301. When shipped to the project site, the dowel bars shall be accompanied by the types of certifications specified in ITM 301 and in accordance with 916.

11. Support Devices

Support devices for all reinforcing bars shall be epoxy coated steel and in accordance with ASTM A775, except as follows.

- a. the steel shall be in accordance with 910.01(b)1;*
- b. the coating color shall contrast with the color of iron oxide;*
- c. the coating thickness shall be 6 to 20 mils after cure. The thickness measurements shall be made in accordance with ASTM D7091.*

COMMENTS AND ACTION

- 503.02 Materials
- 609.02 Materials
- 703.02 Materials
- 910.01 Reinforcing Bars, Dowel Bars and WWR

DISCUSSION:

Mr. Reilman introduced and presented this item explaining that the use of reinforcing bar chairs and supports made of materials other than steel are not performing as intended. The Department is aware of many instances of poor concrete consolidation around reinforcing bars and bar support devices buckling under the weight of the reinforcing mats.

Mr. Reilman proposed to revise the Standard Specifications as shown to require reinforcing bar chairs and supports to be manufactured from steel.

There was no further discussion and this item passed as submitted.

Motion: Mr. Reilman Second: Mr. Pelz Ayes: 10 Nays: 0 FHWA Approval: YES	<p><u>Action:</u></p> <input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 503.02 pg. 433; 609.02 pg. 520; 703.02 pg .650; 910.01 pg. 1048.	<input checked="" type="checkbox"/> 2024 Standard Specifications Revise Pay Items List <input type="checkbox"/> Create RSP (No. __) Effective:
Recurring Special Provisions or Plan Details: 703-R-724 REINFORCING BARS	<input checked="" type="checkbox"/> Revise RSP (No. 703-R-724) Effective: <u>March 1, 2023</u>
Standard Drawing affected: NONE	<input type="checkbox"/> Standard Drawing Effective:
Design Manual Sections affected: NONE	<input type="checkbox"/> Create RPD (No. __) Effective:
GIFE Sections cross-references: NONE	<input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:

The current manufacturing process for prestressed beams utilizes traditional concrete mixes that require a substantial amount of vibration to create complex beam shapes and to achieve consolidation around congested reinforcing steel and prestress strands. The process also requires a significant amount of surface correction after beams are removed from the forms including rubbing, filling of bug holes and repair of honeycombing. Self-Consolidating Concrete (SCC) utilizes a combination of chemical admixtures and aggregate gradation to achieve a concrete mixture that flows and consolidates under its own mass without segregating. The material achieves improved internal consolidation of the beam with zero to minimal vibration. It also produces a surface that requires minimal finishing effort. Additionally, a pilot mix has been tested and shown to have very low permeability which eliminates the need for surface sealing. The use of low permeability mixes will eliminate logistical issues at plants associated with sealing that can also create shipping delays. Overall, the use of SCC will provide higher quality prestressed beams for INDOT and improve the manufacturing processes for the beam supplier.

PROPOSED SOLUTION:

The option to use Self-Consolidating Concrete (SCC) will be added to section 707 for use in prestressed beams.

APPLICABLE STANDARD SPECIFICATIONS: 707

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: 17-5.01(03)

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 707 RSP; suggested BFU: All contracts with a 707 pay item

PAY ITEMS AFFECTED: none

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ad hoc: Daniel Jones, Abul Mazumder, Tommy Nantung, Michael Nelson, Jim Reilman, Bill Tompkins, Pete White

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT Office of Materials Management

Phone Number: 317-522-9692

Date: 08/18/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? Yes

Construction time? Yes

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? N/A

Asset preservation? Yes

Design process? N/A

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? No

Can this item improve/reduce the number of potential change orders? No

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO SPECIAL PROVISIONS

SECTION 707 – PRECAST AND PRECAST, PRESTRESSED CONCRETE STRUCTURAL MEMBERS

707.04 Steel and Concrete Requirements

707.06 Placing and Finishing Concrete

707.12 Basis of Payment

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 707, BEGIN LINE 118, DELETE AND INSERT AS FOLLOWS:

(c) Concrete

Concrete shall be air entrained and ~~in accordance with the applicable requirements of 702.05. The concrete shall have a minimum temperature of 50°F and a maximum temperature of 90°F at the time of placement. Concrete, herein referred to as conventional concrete, or self-consolidating concrete as specified below, shall be in accordance with the applicable requirements of 702.05 and herein referred to as conventional concrete, or self-consolidating concrete as specified below.~~ When a chemical admixture type A, D, F, or G is used, it shall be used in combination with an air entraining admixture. A high range water reducing, HRWR, or high range water reducing retarding, HRWRR, admixture system may be used. Chemical admixture types B, C, and E will only be allowed with prior written permission. *Chemical admixture type C and portland cement type III shall not be used in the same concrete mixture.* Air-entraining cement will not be allowed. The cement content of the mixed concrete shall be sufficient to obtain the specified minimum 28-day compressive strength. The total of portland cement and other cementitious materials shall be a minimum of 564 lb/cu yd and shall not exceed 800820 lb/cu yd. Silica fume may be added in an amount not to exceed 5% of the total cementitious material.

When a type A, D, or E admixture is not used, or if a type B or C chemical admixture is used, slump shall be no less than 1 in. or more than 3 in. When concrete admixtures type A, D, or E is used, slump shall be no less than 2 in. or more than 5 in. When concrete containing admixture type F, G, or admixture systems is used, the concrete shall have a slump no less than 3 in. or more than 8 in. The amount of time from mixing to placement and consolidation shall be a maximum of 30 minutes. The concrete shall not be retempered with additional amounts of chemical admixture types F or G after the initial mixing has been completed.

1. Self-Consolidating Concrete, SCC

SCC may be used in precast prestressed structural members. The proposed mix design shall be submitted to the DTE a minimum of 14 days prior to the trial batch. SCC shall be included in the producer's QCP. A copy of the QCP shall be included with the mix design. The QCP shall describe how the producer's method to will ensure consistent quality for all batches by addressing the following:

- a. *All pertinent specification requirements and target properties for both plastic and hardened SCC. This shall include testing frequencies.*
- b. *Production procedures and testing to ensure the initial batch*

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of SCC is of adequate quality.

- c. Production procedures and testing to ensure that subsequent batches of SCC are of adequate quality.*
- d. SCC is intended to flow and consolidate under its own mass. Production procedures shall include details of the use of any vibration.*

The absolute volume of the mix design shall be 27.0 cu ft per cu yd and shall meet the criteria in 707.04(c) and the following:

<i>SCC Properties</i>		
<i>Physical Test</i>	<i>Specification</i>	<i>Requirement</i>
<i>Slump Flow</i>	<i>ASTM C1611</i>	<i>Design = 22 in. to 28 in. Tolerance = ± 2 in.</i>
<i>Visual Stability Index (VSI)</i>	<i>ASTM C1611</i>	<i>0 or 1</i>
<i>Relative Viscosity, T₅₀</i>	<i>ASTM C1611</i>	<i>2 sec ≤ T₅₀ ≤ 7 sec</i>
<i>J-Ring</i>	<i>ASTM C1621</i>	<i>Difference between the slump flow and J-ring flow must be ≤ 2 in.</i>
<i>Static Segregation</i>	<i>ASTM C1712</i>	<i>≤ 1/2 in.</i>
<i>Column Segregation</i>	<i>ASTM C1610</i>	<i>≤ 12%</i>
<i>Water-cement ratio, max.</i>	<i>ITM 403</i>	<i>0.44</i>

A trial batch of the proposed SCC mix design shall be conducted. All tests in the table above shall be performed. The SCC shall also be tested for air content and yield.

If the mix is to be used without surface sealing in accordance with 707.06, an SCC block 10 in. by 24 in. by 54 in. shall be cast. The block shall be formed and cast inside a water tank. After the SCC has set, the tank shall be filled with lime water covering the top of the block and wood form. The SCC shall be cured in water for 28 days. After a minimum of 28 days the SCC shall be cored. A minimum of ten 10 cores shall be cut. The cores shall be 4 in. outside diameter and the full depth of the block. The cores will be evaluated by the Department for absorption in accordance with ASTM C1585 and bulk resistivity in accordance with ASTM C1876 as follows:

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<i>SCC Properties for Low Permeability</i>		
<i>Physical Test</i>	<i>Specification</i>	<i>Requirement</i>
<i>Absorption rates, max.</i>	<i>ASTM C1585</i>	<i>7.0 x 10⁻³ mm/s² (Initial) 1.5 x 10⁻³ mm/s² (Secondary)</i>
<i>Absorption, max.</i>	<i>ASTM C1585</i>	<i>1.5 mm (Initial) 3.0 mm (Secondary)</i>
<i>Resistivity, min.</i>	<i>ASTM C1876</i>	<i>130 Ohm-m</i>

12. Cold Weather Concrete

Cold weather concrete shall be in accordance with 702.11.

23. Hot Weather Concrete

When it is necessary to fabricate concrete structural members during times of hot weather the mix water may be chilled or an appropriate amount of ice may be added to the concrete mix in order to produce concrete of the temperature specified herein.

34. Acceptance Testing

Acceptance of precast and precast, prestressed structural members will be based on ~~the following tests for slump, air content, and compressive strength in accordance with the Frequency Manual. All slump, air content, and compressive strength tests shall be performed in the presence of the Engineer. For conventional concrete S slump, and air content, and compressive strength tests measurements shall be performed obtained each time cylinders are made. For SCC slump flow, air content, relative viscosity, visual stability index, and compressive strength tests shall be performed. Compressive strengths of the structural members shall be determined from cylinder sets described herein. The 28-day compressive strength shall be equal to or greater than the specified concrete compressive strength. The compressive strength of the concrete for each structural member will be determined from the average strength of the cylinder set representing that member. No individual strength within a cylinder set representing a structural member shall be less than 90% of the specified concrete compressive strength.~~

Compressive strengths of the structural members shall be determined from cylinder sets described herein. The 28-day compressive strength shall be equal to or greater than the specified concrete compressive strength. The compressive strength of the concrete for each structural member will be determined from the average strength of the cylinder set representing that member. No individual strength within a cylinder set representing a structural member shall be less than 90% of the specified concrete compressive strength.

All molds, facilities, labor, and materials necessary to prepare, cure, and test the

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cylinder sets shall be furnished.

a. Cylinder Set

A cylinder set shall consist of ~~at least three cylinders obtained from three separate batches or loads of concrete used in casting a structural member~~ *one cylinder from each set of tests taken in accordance with the Frequency Manual.* The batches or loads to be sampled may be as directed by the Engineer. All cylinders for acceptance shall be 6 in. diameter by 12 in., or 4 in. diameter by 8 in., molded and field cured in accordance with ASTM C31. The Contractor may make additional cylinder sets for use in acceptance testing. *If 4 in. diameter by 8 in. cylinders are used, cylinder strengths shall be multiplied by a reduction factor as follows:*

<i>Strength Reduction Factor for 4 in. diameter by 8 in. cylinders</i>	
<i>Cylinder Age</i>	<i>Reduction Factor</i>
<i>≤ 48 h</i>	<i>0.97</i>
<i>> 48 h</i>	<i>0.94</i>

SECTION 707, BEGIN LINE 193, DELETE AND INSERT AS FOLLOWS:

b. Precast, Non-Prestressed Structural Members

When fabricating precast, non-prestressed structural members, ~~a minimum of one cylinder set shall be made per member cast~~ *the number of cylinder sets shall be cast in accordance with the Frequency Manual.* The 28-day compressive strength of the concrete for each structural member will be determined by the average strength of the cylinder set representing that member. The fabricator may elect to make additional cylinder sets for use in acceptance testing prior to 28 days.

c. Precast, Prestressed Structural Members

~~A minimum of two cylinder sets shall be made for each structural member cast~~ *Cylinder sets shall be cast in accordance with the Frequency Manual.* One cylinder set shall be tested and used to determine when the precast, prestressed structural member has met or exceeded the required strength for detensioning the prestressing bed. If an additional cylinder set as described above has been made, the Contractor may test this set to determine if the required strength for detensioning of the prestressing bed has been met or exceeded, or if the required 28-day compressive strength has been met or exceeded prior to an age of 28 days. The Engineer will accept the results from the compression testing on the additional cylinder set, in place of either the detensioning strength test results, or the 28-day compressive strength test results, if the results equal or exceed the respective compressive strength requirements. If an additional cylinder set was not made, or if the additional cylinder set does not meet or exceed the 28-day compressive strength requirement, the remaining cylinder set shall be tested at 28 days of age to determine the acceptability of

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the structural members.

SECTION 707, BEGIN LINE 297, DELETE AND INSERT AS FOLLOWS:

The tops of all beams and the outside faces and bottom flanges of the fascia beams shall be sealed in accordance with 709. *The sealing requirement will be waived if the concrete meets the low permeability criteria specified in 707.04(c)1.*

SECTION 707, BEGIN LINE 495, DELETE AND INSERT AS FOLLOWS:

Reinforcing bars, prestressing strands, elastomeric bearing pads, modifications to bearing pads, bearing beams required for box beams, bearing assemblies required for I-beams, bulb-T beams, U-beams, and box beams, bearing plates, threaded reinforcing bars, threaded inserts in fascia beams, hex bolts, sealer on the outside face and bottom flange of fascia beams and on the tops of all beams, and necessary incidentals shall be included in the cost of the pay items of this section. The cost of tensioning rods and steel plates shall be included in the cost of the pay items of this section. The cost for providing all molds, cylinder identification tags, facilities, labor, *testing, testing apparatuses, required trial batches, materials, and materials* ~~required for work in this section~~ *and ensure that the concrete meets the requirements of this specification* shall be included in the cost of the pay items in this section.

APPROVED

COMMENTS AND ACTION

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DISCUSSION:

Mr. Reilman introduced and presented this item stating that the current manufacturing process for prestressed beams utilizes traditional concrete mixes that require a substantial amount of vibration to create complex beam shapes and to achieve consolidation around congested reinforcing steel and prestress strands. The process also requires a significant amount of surface correction after beams are removed from the forms including rubbing, filling of bug holes and repair of honeycombing. Self-Consolidating Concrete, SCC, utilizes a combination of chemical admixtures and aggregate gradation to achieve a concrete mixture that flows and consolidates under its own mass without segregating. The material achieves improved internal consolidation of the beam with zero to minimal vibration. It also produces a surface that requires minimal finishing effort. Additionally, a pilot mix has been tested and shown to have very low permeability which eliminates the need for surface sealing. The use of low permeability mixes will eliminate logistical issues at plants associated with sealing that can also create shipping delays. Overall, the use of SCC will provide higher quality prestressed beams for the Department and improve the manufacturing processes for the beam supplier.

Mr. Reilman proposed that the option to use SCC be added to section 707 for use in prestressed beams.

Mr. Koch pointed out that the sentence in 1. Self-Consolidating Concrete, SCC, includes both shall and will. Mr. Koch proposed revising the language to “The QCP shall describe the producer’s method to ensure consistent quality for all batches...”, which has been incorporated as shown in these Minutes. Other minor editorial revisions are shown as well.

Mr. Koch also asked if, in the revision to 707.06, is 707.04(c)1a the correct reference as the section is related to cylinder testing. Is the intent meant to be 707.04(c)1? SCC? Mr. Reilman concurred and the revisions are as shown.

There was no further discussion and this item passed as revised.

	Action:
Motion: Mr. Reilman Second: Mr. Pelz Ayes: 10 Nays: 0 FHWA Approval: YES	<input type="checkbox"/> Passed as Submitted <input checked="" type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 707 begin pg. 663.	<input checked="" type="checkbox"/> 2024 Standard Specifications <input type="checkbox"/> Revise Pay Items List
Recurring Special Provisions or Plan Details: 707-B-318 PRECAST AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS	<input type="checkbox"/> Create RSP (No. __) Effective: <input checked="" type="checkbox"/> Revise RSP (No. <u>707-B-318</u>) Effective: <u>March 1, 2023</u>
Standard Drawing affected: NONE	<input type="checkbox"/> Standard Drawing Effective:
Design Manual Sections affected: 17-5.01(03)	<input type="checkbox"/> Create RPD (No. __) Effective:
GIFE Sections cross-references: NONE	<input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The need has arisen for the Department to address removing an existing polymeric overlay from a bridge deck. Also, the requirement to mill an existing concrete surface is now believed to be unnecessary.

PROPOSED SOLUTION: Incorporate the proposed additions to address removal of an existing polymeric overlay. Also, remove the requirements to mill an existing concrete surface as the surface preparation necessary to achieve the required surface profile is sufficient.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: Figure 502-2C

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: existing RSP 738-B-297

PAY ITEMS AFFECTED: create new 738 pay item for Removal of Existing Polymeric Overlay

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ad hoc: Abul Mazumder, Michael Nelson, Jim Reilman, Pete White. Also considered comments from Jack Blakley

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman
Title: State Materials Engineer
Organization: INDOT
Phone Number: (317) 522-9692

Date: 8/18/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? Yes

Construction time? Yes

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? N/A

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

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738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

(Revised 03-17-22)

The Standard Specifications are revised as follows:

SECTION 737, AFTER LINE 154, INSERT AS FOLLOWS:

SECTION 738 – WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR OTHER CONCRETE SURFACES

738.01 Description

This work shall consist of cleaning and preparing a bridge deck surface and other, non-bridge deck surfaces, furnishing and mixing materials, and applying a two-coat polymer overlay system in accordance with 105.03.

The Contractor shall provide a performance warranty for the two-coat polymer overlay system in accordance with 738.13 when the polymer overlay system is applied to the surface of a bridge deck. A performance warranty will not be required for two-coat polymer overlay systems applied to an RCBA or other concrete surface, other than a bridge deck.

MATERIALS

738.02 Materials

Materials shall be in accordance with the following:

<i>Fine Aggregates</i>	<i>904.02</i>
<i>Polymer for Polymer Overlay Systems.....</i>	<i>909.13</i>
<i>Rapid Setting Patch Materials.....</i>	<i>901.07</i>

All aggregate shall be delivered to the project site in sealed waterproof bags or containers.

CONSTRUCTION REQUIREMENTS

738.03 Quality Control

Prior to beginning work, the Contractor shall prepare a QCP detailing the construction of the polymer overlay system. The QCP shall be approved by the manufacturer of the polymer materials and be documented with the manufacturer's signature on the QCP approval page. Any deviations from the application prescribed by this specification shall be explained in the QCP. Once the QCP has been approved by the manufacturer, it shall be submitted to the Engineer.

The QCP shall include:

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738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

- (a) a current copy of ISO 8502-3, Tests for the Assessment of Surface Cleanliness,
- (b) all materials proposed to be used including product data sheets,
- (c) all equipment proposed to be used,
- (d) all verification testing equipment to be used,
- (e) application procedures,
- (f) minimum and maximum air and deck surface temperatures for which work will occur,
- (g) proposed schedule for, and means of, traffic control,
- (h) methods to be used for patching and crack repair,
- (i) methods to be used for surface preparation and application of the polymer overlay system,
- (j) any other information the Contractor believes relevant and will help the Engineer in their review of the submitted QCP.

No work shall begin until the Engineer has signed the QCP.

738.04 Equipment

Equipment shall be in accordance with the following.

(a) Concrete Surface Preparation Equipment

Concrete surface preparation equipment shall consist of shot-blasting equipment that can remove the existing surface texture and generate the required surface macrotexture in accordance with 738.05. The shot-blasting equipment shall be equipped with oil and moisture traps. *[next statement moved to a separate paragraph]*

On a bridge deck, the concrete surface shall be removed up to the vertical face of bridge railings or barriers and to the edge of transverse bridge joints. If the equipment specified in this section for surface preparation is not capable of removing the concrete surface in these areas, hand tools or other equipment may be proposed in the QCP for use by the Contractor.

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~~For shot blasting, the blasting medium for shot blasting shall be steel shot. No substitutions will be allowed.~~

The residue generated by the surface preparation shall be contained, removed, and disposed of in accordance with 202.

(b) Air Compressor

When compressed air is specified for use, it shall be free from oil and moisture contamination in accordance with ASTM D4285. Cleanliness of the compressed air shall be verified by using either an absorbent or non-absorbent white collector material positioned a maximum of 24 in. from the air discharge point, centered in the compressed air stream. Compressed air shall discharge onto the collector material a minimum of 1 minute. The Contractor and Engineer shall jointly visually examine the collector material for the presence of oil or water. The Engineer will be the final authority in case of disagreement on the presence of oil or water. Verification of the cleanliness of the compressed air shall be performed a minimum of one time per shift for each air compressor in operation. If contamination is observed on the collector material, that air compressor shall not be used until necessary repairs are made to the unit so clean, dry air is achieved. All work performed since the previous cleanliness verification shall be examined to determine if the work area has been contaminated. If contaminated, the affected work area shall be re-shot blasted to remove the contamination.

(c) Polymer Mixing and Distribution Equipment

Polymer mixing and distributing equipment shall, at a minimum, consist of a truck-mounted, temperature-controlled polymer mixing and distribution system capable of accurately blending the resin and hardening components of the polymer system. The mixing and distributing system shall include thermostat heating element-controlled mixing capability. Each component of the polymer shall be supplied by a pump. Wheelbarrows shall not be used as a polymer mixing and distribution system.

The amount of the resin and hardener components shall be continuously and independently measured with flow meters prior to mixing. Mixing shall be in-line and produce a continuous stream of mixed polymer at the manufacturer's required proportioning prior to exiting the dispensing nozzle. The mixing equipment may be either a truck mounted mechanical mixer or the material may be mixed by a static mixer contained in the wand applicator.

1. Hand Applications

Notched squeegees with 3/16 in. deep notches and 1/2 in. nap rollers shall be used to distribute the mixed polymer.

2. Mechanical Applications

The mixing equipment and distribution system shall automatically and accurately proportion the components in accordance with the manufacturer's recommendations, mix,

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and continuously apply the mixed polymer uniformly and accurately to the work area at the specified rate.

(d) Aggregate Distribution Equipment

The aggregate distribution system shall consist of a truck-mounted air-blown pneumatic spreader using oil-free compressed air in accordance with 738.04(b). The spreader shall apply the aggregate to the surface in a uniform manner. Chip spreaders, salt spreaders, or other rotary-type spreaders shall not be used.

738.05 Preparation of Concrete Surfaces

(a) Removal of Existing Polymer Overlay System from Concrete Surfaces

When an existing polymer overlay system is to be removed from concrete surfaces, the removal shall be performed with a milling machine affixed with a fine milling drum. The teeth spacing on the fine milling drum shall not exceed 5/16 in. Removal in areas that are inaccessible to the milling machine shall be performed by shot blasting, hand grinding, scarification, scabbling, or chipping using a maximum 30 lb chipping hammer.

Once the existing polymer overlay system has been removed, the resulting concrete surface shall be prepared in accordance with 738.05(b) if the concrete surface is to receive another polymer overlay system, or prepared in accordance with 722.06(b) if the concrete surface is to receive a concrete bridge deck overlay.

(b) Removal of Existing Concrete Surface

*The top 1/4 in. of the All existing concrete surface texture and an additional depth below that as needed shall be removed with equipment in accordance with 738.04(a) until a macrotexture producing a concrete surface preparation, CSP, value of 7 in accordance with the International Concrete Repair Institute, ICRI, Guideline 310.2R, *Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair* has been achieved. The Contractor shall provide a set of the CSP chips for the Engineer's use on the project. The CSP chip set shall remain the property of the Contractor. *[next statement moved to a separate paragraph]**

*Compressed air used for shot blasting activities shall be in accordance with 738.04(b). *[next statement moved to separate paragraph]**

After the existing concrete surface material has been removed, all remaining residue from the operation shall be gathered up with a vacuum system equipped with fugitive dust control devices that can remove all dust and other material not securely bonded to the concrete surface and discarded. The Contractor shall then sound the entire concrete surface and mark any areas to be repaired. All existing partial depth patches, delaminated areas, spalls, and breakouts shall be removed and repaired by partial depth patching in accordance with 722.07, except that the patching materials used shall be in accordance with the following:

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~~(#1.)~~ Rapid setting patch materials shall be used for patching areas that are 2 1/2 in. or deeper as measured from the prepared concrete surface. The rapid setting patch material selected shall have written approval from the manufacturer that there are no compatibility issues between the polymer overlay system materials and the rapid setting patch materials.

~~(#2.)~~ If the patch depth is less than 2 1/2 in. from the prepared concrete surface either the polymer material or rapid setting patch materials may be used for patching.

Patches shall be cured for the longer of the minimum times required by either the manufacturer of the rapid setting patch material or the manufacturer of the polymer materials, prior to performing any additional surface preparation activities or installing a polymer overlay system.

Type I-A joints shall be cleaned, and all existing joint sealing material shall be completely removed. If the repair is 2 1/2 in. or deeper as measured from the prepared concrete surface, rapid setting patch materials shall be used and allowed to fully cure prior to applying the polymer overlay system. If the depth of repair is less than 2 1/2 in., the repair may be made at the time of the polymer overlay system installation using the polymer material proportioned ~~according to~~ in accordance with the manufacturer's instructions.

Once all deleterious material has been removed and areas 2 1/2 in. and deeper have been patched, the Engineer will sound the entire concrete surface. When the Engineer is satisfied that all deleterious material has been removed and patches and repaired areas are sound, the Contractor shall proceed with shot blasting all patched and repaired areas with steel shot using equipment in accordance with 738.04(a) until a ~~concrete surface profile~~ macrotexture producing a CSP value of 7, ~~in accordance with this section~~, has been achieved. Sand blasting shall not be used in place of shot blasting.

The concrete surface shall be cleaned with a vacuum system equipped with fugitive dust control devices that is capable of removing all dust and all other material not securely bonded to the concrete surface. Mechanical brooms, without water or vacuuming, shall be used to remove any residual dust or material that adheres to the prepared concrete surface after it has been vacuumed. After brooming is performed, the concrete surface shall be vacuumed again to remove the last remaining residual dust and loose material. The entire concrete surface shall be completely free of asphalt material, oil, dirt, rubber, curing compounds, paint carbonation, laitance, weak surface mortar, traffic marking materials, and other potentially detrimental materials, which may interfere with the bonding or curing of the polymer overlay system. ~~Traffic marking materials within the application area shall be removed. The cleaned, prepared concrete surface shall meet the International Concrete Repair Institute, ICRI, Guideline 310.2R, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair, CSP, 7. The Contractor shall provide a set of the CSP chips for the Engineer's use on the project. The CSP chip set shall remain the property of the Contractor.~~

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Pretreatment for cracks in accordance with the manufacturer's recommendations shall be incorporated into the installation of the polymer overlay system. The material used in the pretreatment of cracks shall be in accordance with the manufacturer's recommendations and specifications.

738.06 Surface Cleanliness Verification Testing

After the final surface preparation has been completed and immediately before application of the polymer overlay system, the cleanliness of the prepared concrete surface shall be verified by testing in accordance with ISO 8502-3. The testing criteria will shall be as follows:

<i>Sample Size</i>	<i>Frequency</i>	<i>Minimum Requirements (Class size)</i>
<i>Each bridge span or concrete surface less than 600 sq yd in area</i>	<i>1 test patch per 100 sq yd area</i>	<i>Average of tests not more than class 2 with no single test patch greater than class 3.</i>
<i>Each bridge span or concrete surface 600 sq yd and greater in area</i>	<i>6 per 600 sq yd area</i>	<i>Average of tests not more than class 2 with no single test patch greater than class 3.</i>

Testing shall be performed in the presence of the Engineer and a copy of ISO 8502-3 shall be provided to the Engineer so the Engineer may determine the class. If the surface cleanliness verification test results in an average class greater than that shown in the table above, the entire concrete surface shall be cleaned again with a vacuum system or mechanical broom and a vacuum system in accordance with 738.04(b) and retested until the concrete surface is clean enough to yield an average class result in accordance with the requirements shown in the table above.

738.07 Applying the Polymer Overlay System

Patching and cleaning operations shall be inspected and approved prior to applying each layer of the polymer overlay system. Any contamination of the concrete surface or intermediate polymer overlay system courses, after initial cleaning, shall be removed. Both courses of the polymer overlay system shall be applied within 24 hours following the final cleaning and prior to opening the area to traffic.

(a) Environmental Condition Requirements

1. Surface Moisture

A self-calibrating electrical impedance meter meeting the requirements of ASTM F2659 shall be used to check surface moisture on the concrete surface. The brand and model of the meter as well as manufacturer specification sheets showing compliance with

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ASTM F2659 shall be included in the QCP.

Immediately prior to beginning application of the polymer overlay system, surface moisture readings shall be taken at six locations per bridge span. Three locations shall be within 1 ft of the bridge railing on the low side of the cross slope spaced throughout the span and the other three shall be located within a lane between the typical wheel paths in the span. If the polymer overlay system is being applied to the RCBA or another concrete surface, four surface moisture readings shall be taken on each RCBA or other concrete surface. Two locations shall be within 1 ft of the outside edge of the RCBA or other concrete surface and the other two shall be located within a lane between the typical wheel paths in the span. The meter shall be calibrated before taking any readings at the first location. Thereafter, the meter shall again be calibrated before taking any readings at a new location on the bridge or RCBA. All readings shall be 4.0% moisture content or lower in order to begin application of the polymer overlay system. No visible moisture shall be present on the prepared concrete surface or patch material at the time of application of the polymer overlay system. Compressed air in accordance with 738.04(b) may be used to dry the concrete surface.

2. Weather Limitations

Polymer overlay materials shall be applied when the temperature of the concrete surface is between 50°F and 100°F and the ambient temperature is forecast to be 50°F and rising within 8 h of application. Materials shall not be applied on a wet surface when surface moisture readings taken on the deck exceed 4.0%, or when rain is forecast within 12 h of beginning the application.

(b) Application Verification Rate Requirements

The Contractor shall verify the volume of polymer overlay being applied by performing volume measurements at 25 ft intervals as measured along the longitudinal length of the concrete surface. This shall be done by marking the resin and hardener component tote levels in permanent marker concurrent with the completion of a 25 ft longitudinal length section of concrete surface. Marking of the resin and hardener component tote levels shall continue every 25 ft of completed concrete surface length as work progresses. Volume of each 25 ft section shall then be calculated and logged based upon the height between marks and the actual tote length and width. Actual volume applied for each 25 ft section shall be logged per course of polymer overlay. The actual volume shall be divided by the actual area of coverage, 25 ft x width, in order to verify quantity applied meets or exceeds the minimum rates shown in the table below. Volumes utilized and calculations shall be logged by the Contractor with station information for each section and provided to the Engineer.

<i>Course</i>	<i>Rate, gal./100 sq ft</i>	<i>Aggregate, lbs/sq yd*</i>
<i>1</i>	<i>No less than 2.5</i>	<i>No less than 10</i>
<i>2</i>	<i>No less than 5.0</i>	<i>No less than 14</i>
<i>* Aggregate application shall be of sufficient quantity to completely cover the polymer.</i>		

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(c) Mixing, Application, and Curing

The polymer course and the aggregate course shall be applied in two separate operations in accordance with the following rates of application.

1. Polymer

Both the resin and hardener components of the polymer shall have a temperature of 75°F or higher at the time of mixing and application. Handling and mixing of the polymer resin and hardening components shall be performed in a manner to achieve the desired results in accordance with these specifications and the manufacturer's recommendations as approved or directed by the Engineer. Polymer overlay systems shall not be applied when weather or surface conditions are such that the material cannot be properly handled, applied, spread, and cured within the specified requirements or cure time and traffic control.

After the polymer mixture has been prepared, it shall be immediately and uniformly applied to the entire concrete surface using one of the following application methods. The rate of application for each course shall be verified by using the application verification rate requirement in accordance with 738.07(b). The distribution system, or distributor, shall apply the mixed polymer uniformly and accurately to the work area at the specified rate. The viscosity of the polymer shall be such that a uniform thickness is maintained during curing and ponding along the railing or other low points does not occur.

a. Hand Application

Notched squeegees and rollers in accordance with 738.04(c)1 shall be used to control and ensure the application of a uniform thickness of the polymer overlay. Flat squeegees shall not be used.

b. Mechanical Application

Placement of the polymer overlay system using mechanical means shall be performed by equipment in accordance with 738.04(c)2. The operation shall proceed in such a manner that does not allow the mixed polymer to segregate, dry, be exposed, or otherwise harden or set in a way as to impair the retention and bonding of broadcasted aggregate.

2. Aggregate

Dry aggregate shall be applied immediately after applying the polymer to the prepared surface. The aggregate shall be applied in such a manner as to cover the entire surface in excess within 5 minutes of polymer placement.

3. Curing

The Contractor shall plan and prosecute the work to provide the following minimum curing periods, or other longer minimum curing periods if prescribed by the manufacturer.

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The deck temperature shall be taken immediately prior to placing the polymer overlay system. This deck temperature reading shall be the one used in the curing table below to obtain the required minimum curing time. The polymer overlay system shall be cured in accordance with the curing table below and based on the manufacturer's requirements prior to vacuuming and brooming the finished surface.

The minimum curing periods shall be as follows:

Course	Minimum Cure Time by Deck Temperature, °F							
	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	≥ 85
1	7 1/2 h	5 1/2 h	4 h	3 h	2 1/2 h	2 h	1 1/2 h	1 h
2	11 h	8 1/2 h	6 1/2 h	5 h	4 h	3 h	3 h	3 h

Traffic or equipment shall not be allowed on the polymer overlay system surface during the curing period. The Contractor shall minimize all foot traffic on the uncured polymer overlay system and ensure that any foot traffic will only be done with steel spiked shoes approved by the Engineer. After the first course curing period, all loose aggregate shall be removed by vacuuming or brooming, without tearing or damaging the surface. Then the next course of polymer shall be applied to completion. All loose aggregate from both the first and second courses shall be discarded and not reused in the polymer overlay system.

A surface having received only the first course application of aggregate shall not be opened to traffic.

738.08 Joints and Raised Pavement Markers

Unless otherwise specified by the Engineer, the polymer overlay system shall not be applied over expansion joints or raised pavement markers. Expansion joints and raised pavement markers shall be coated with a bond breaker or covered using an approved tape that can adequately seal the joints and markers from the polymer. Duct tape may be used to delineate application areas. All taped areas or bond breakers shall be removed before the polymer fully cures.

The Type I-A joint gap shall be reestablished by saw cutting and sealing in accordance with 609.05 after both courses of the polymer overlay system have been applied and cured.

In the event saw cutting for the type I-A joint damages or mars the top surface of the polymer overlay system, damaged areas shall be removed by saw cutting in rectangular sections to the top of the deck surface and reapplying the polymer overlay system courses in accordance with this specification.

738.09 Required Records

For all materials provided, the Contractor shall maintain and provide records to

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the Engineer including but not limited to, the following:

1. *Batch numbers and sizes.*
2. *Location of batches as applied to the concrete surface, referenced by stations.*
3. *The calculated rate of application for each 25 ft length of concrete surface for each course.*
4. *Batch time, gel time.*
5. *Temperature of the air, concrete surface, polymer resin and hardener components, and aggregates.*
6. *Loose aggregate removal time.*
7. *Time opened to traffic.*

738.10 Opening to Traffic

The polymer overlay system may be opened to traffic after meeting all cure time requirements for both courses in accordance with 738.07(c)3 and all other manufacturer's requirements.

738.11 Temporary and Permanent Pavement Markings

Temporary tape pavement marking, type I, used on portions of the completed polymer overlay system shall be installed per the manufacturer's recommendations and shall be firmly pressed into place to provide adequate bond to the exposed aggregate surface.

Retro-reflectivity testing will not be required on concrete surfaces where a polymeric overlay system has been applied.

Heat-bonded pavement markings or temporary paint pavement markings shall not be used on any portions of the polymer overlay system.

738.12 Final Clean Up

If directed by the Engineer, at the end of the project or a minimum of 7 days after the polymer overlay system has fully cured, all loose aggregate that has shed shall be removed by vacuuming or brooming and not re-used. In addition, if the visibility of the recently applied pavement markings has been reduced due to adherence to loose aggregate, they shall be reapplied.

738.13 Performance Warranty

(a) General

The Contractor shall be responsible for and guarantee the performance of the polymer overlay system that has been applied to the bridge deck surface, as defined herein, for a period of three years after the initial acceptance date defined in 738.13(b)4. The Contractor shall warrant to the Department that the warranted work will be free of defects

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as measured by the condition parameters in 738.14(c)1 and not exceed the specified threshold values for each.

The performance warranty requirements for the polymer overlay system will not apply to an RCBA or other surfaces outside of the limits of the bridge deck surface.

The performance warranty and its provisions shall not be construed as extending or otherwise affecting the claim process and statute of limitations otherwise applicable to this contract.

(b) Definitions

The following definitions shall apply.

- 1. Bridge Deck Surface. The surface area contained within the out-to-out of coping width dimension and end-to-end of bridge floor length dimension. Items with raised vertical faces such as but not limited to bridge railings, sidewalks, curbs, median curbs, and barriers will not be considered part of the bridge deck surface for purposes of this specification.*
- 2. Conflict Resolution Team, CRT. A group consisting of five individuals whose sole responsibility is to provide a decision on disputes between the Department and the Contractor regarding application or fulfillment of the warranty requirements. The CRT is described in more detail in 738.15.*
- 3. Delamination. Debonding of the polymer overlay system from the existing bridge deck surface.*
- 4. Initial Acceptance Date. The same date as the date of the final acceptance of the contract. This date will be considered the start of the warranty period.*
- 5. Scaling. Worn polymer overlay system surface with loss of epoxy and aggregate resulting in a reduction in thickness of the polymer overlay system greater than 20% of the initial overlay thickness.*
- 6. Spalling. Broken or missing pieces of the polymer overlay system.*
- 7. Warranted Work. The work product, polymer overlay system, that is guaranteed not to fall outside the specified thresholds of the condition parameters as defined in 738.14(c)1 during the warranty period.*

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8. *Warranty Period. The three-year period of time the Contractor is required to ensure the performance of the polymer overlay system meets or exceeds the minimum specified threshold condition parameters as defined in 738.14(c)1.*
9. *Warranty Work. Corrective actions or remedial actions performed by the Contractor during the warranty period to bring the warranted work back into compliance with the specifications. All costs of warranty work shall be borne by the Contractor including traffic control, mobilization/demobilization, materials, pavement markings, and other incidental work and items. For purposes of this specification, the terms warranty work, corrective action, and remedial action are all interchangeable and shall have the same meaning.*

738.14 Warranted Conditions and Warranty Work

The warranty period shall start upon final acceptance of the contract.

(a) Warranted Elements

For the warranty period, the Contractor shall ensure that the polymer overlay system that is applied to the bridge deck surface performs as intended and none of the thresholds for condition parameters in 738.14(c)1 are exceeded at any time during the warranty period.

(b) Evaluation Method

The Department will monitor and conduct polymer overlay system evaluations for each bridge deck surface throughout the warranty period by means of the Indiana Bridge Inspection Application System in accordance with the National Bridge Inspection Standards. Evaluations will consist of regular field condition reviews conducted by Department personnel. The Department will be responsible for notifying the Contractor, in writing, of any condition parameters that exceed threshold limits defined herein. The Department reserves the right to conduct impromptu inspections to evaluate the performance of the warranted polymer overlay system. The Contractor shall not be relieved of any responsibility based upon a claim that the Department failed to adequately monitor the structure or to report its findings to the Contractor.

(c) Warranty Work

Warranty work will be required when a threshold limit for a condition parameter identified in the Thresholds for Condition Parameters Table in 738.14(c)1 has been exceeded. All warranty work shall be in accordance with the 738 specifications.

During the warranty period, warranty work shall be performed at no cost to the Department and shall be based on evaluations of the condition parameters in 738.14(c)1. Upon written notification from the Department that warranty work is required, the Contractor shall submit a written course of action for performing needed warranty work

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for approval a minimum of 10 days prior to the desired start date. If the Contractor disputes the findings, written notification of the dispute shall be provided within 30 days of the date of the notification from the Department. Warranty work shall be performed no later than October 1 of the year of Department notification. Warranty work to be performed and materials to be used will be the joint decision of the Department and the Contractor.

The Department will review the Contractor's proposal for time, methods, and traffic control to perform warranty work. No warranty work shall proceed until the Contractor has been issued written permission to proceed from the Engineer. The Department will be the sole decider whether warranty work performed by the Contractor meets the contract specifications. If warranty work performed by the Contractor necessitates repair of adjacent lanes or roadway shoulders, or reapplication of pavement markings, the required work and corresponding costs shall be the responsibility of the Contractor.

Coring, milling, grinding, or other destructive procedures shall not be performed by the Contractor without prior written approval from the Department. If the Contractor elects to conduct any independent testing, both destructive and non-destructive, the equipment shall be calibrated and correlated with the Department's equipment.

The Contractor will not be responsible for damages to the pavement as a result of coring, milling, grinding, or other destructive procedures conducted by the Department.

During the warranty period, the Contractor will not be held responsible for polymer overlay system distresses including but not limited to chemical and fuel spills, vehicle fires, structural repairs requiring deck patching, removal or replacement, and quality assurance testing such as coring. However, the Contractor shall be responsible for wear or damage by snowplow blades and other winter maintenance operations.

Other factors considered to be beyond the control of the Contractor which may contribute to polymer overlay system distress will be considered by the Engineer on a case-by-case basis upon receipt of a written request from the Contractor.

1. Condition Parameters

Condition parameters identified in the table below will be used to determine the performance of the polymer overlay system during the warranty period. Each condition parameter has a threshold limit applied to each structure and a maximum percentage of defects allowed before warranty work or corrective action is required.

If one or more of the following threshold limits for condition parameters listed in the table below is exceeded, warranty work will be required and shall be performed. Warranty work shall be performed prior to conclusion of the warranty period or within such other time frame as agreed to between the Department and the Contractor unless conditions dictate otherwise.

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<i>Thresholds for Condition Parameters</i>	
<i>Condition Parameter</i>	<i>Threshold Limits per Surface Area for Each Structure*</i>
<i>Spalling</i>	<i>0.5%</i>
<i>Scaling</i>	<i>1.0%</i>
<i>Delamination</i>	<i>1.0%</i>
<i>* once exceeded, warranty work shall be performed</i>	

The defective areas of the polymer overlay system may or may not be contiguous to necessitate warranty work. The Contractor shall ensure any warranty work requiring removal or replacement is made at a sufficient depth to restore the integrity of the polymer overlay system surface.

2. Corrective Actions

The Contractor shall perform the work necessary to repair all deficiencies associated with the warranted condition parameters. The Department will accept the listed corrective action if the action addresses the cause of the condition parameter as listed in the Thresholds for Condition Parameters Table in 738.14(c)1. The Contractor may use an alternative corrective action subject to Department approval.

<i>Corrective Actions</i>	
<i>Condition Parameter</i>	<i>Recommended Corrective Action</i>
<i>Spalling</i>	<i>Repair with polymer overlay system of equal thickness and durability as the original overlay.</i>
<i>Scaling</i>	
<i>Delamination</i>	<i>Sound overlay to determine extent of delamination. Remove damaged polymer overlay, and repair with polymer overlay system of equal thickness and durability as the original polymer overlay system.</i>

738.15 Conflict Resolution Team

If a dispute arises on the application or fulfillment of the terms of this performance warranty, either party may serve written notice that the appointment of a CRT is necessary.

The CRT will consist of five members:

- (a) two members selected and fully compensated by the Department,*
- (b) two members selected and fully compensated by the Contractor,*
and
- (c) one member mutually selected by the Department and the Contractor. Full compensation for the third-party member will be equally shared by the Department and the Contractor.*

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The CRT members will be identified in writing when needed and will be knowledgeable in the terms and conditions of this performance warranty, specification, and the methods used in evaluating the overlay condition. The CRT will render a final recommendation to the Chief Engineer by a majority vote. Each member has an equal vote.

738.16 Department Maintenance

The Department will retain the right to perform, and may perform, routine maintenance operations during the warranty period including, but not limited to, plowing, applying de-icing chemicals, repairs to safety appurtenances, pavement markings, mowing, and sign maintenance. The Department, during the warranty period, will perform no routine bridge surface maintenance activities.

Routine maintenance performed by the Department will not diminish the Contractor's responsibilities under this warranty.

738.17 Method of Measurement

Removal of the existing polymer overlay system will be measured by the square yard of deck area regardless of the number of passes with the milling machine.

The accepted quantities of the warranted polymer overlay system for bridge decks will be measured by the square yard. The accepted quantities of the polymer overlay system applied to an RCBA or other concrete surfaces will be measured by the square yard. Partial depth patching will be measured by the square foot. Pavement markings, temporary and permanent, will be measured in accordance with 801.17 and 808.12, respectively.

Rapid setting patch materials used for patching concrete for partial depth patching will not be measured. Polymer material used for partial depth patching will not be measured. Construction or repairs to type I-A joints will not be measured.

738.18 Basis of Payment

Removal of the existing polymer overlay system will be paid for at the contract unit price per square yard of bridge deck, remove existing polymer overlay system.

Warranted polymer overlay systems for bridge decks will be paid for at the contract unit price for warranted polymer overlay, bridge deck. Polymer overlay systems applied to the RCBA or other concrete surfaces will be paid for at the contract unit price for polymer overlay, other concrete surface. Partial depth patching will be paid for at the contract unit price per square foot as bridge deck patching, partial depth, in accordance with 722.16. Pavement markings, temporary and permanent, will be paid for in accordance with 801.18 and 808.13, respectively.

Payment will be made under:

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<i>Pay Item</i>	<i>Pay Unit Symbol</i>
<i>Bridge Deck, Remove Existing Polymer Overlay System.....</i>	<i>SYS</i>
<i>Polymer Overlay, Other Concrete Surface.....</i>	<i>SYS</i>
<i>Warranted Polymer Overlay, Bridge Deck</i>	<i>SYS</i>

The cost of removing an existing polymer overlay system by shotblasting or other acceptable means in areas adjacent to the curb or areas otherwise inaccessible to the power-operated mechanical milling machine shall be included in the cost of bridge deck remove existing polymer overlay system. The cost of disposing of overlay removal residue, including water, dust, concrete, polymer, and incidentals shall be included in the cost of bridge deck remove existing polymer overlay system.

The cost of hand-chipping, removal of unsound concrete, preparation of cavity surfaces, furnishing and applying bond coat or polymer resin adhesive as required, furnishing and placing rapid setting patch materials used as patching concrete, furnishing and placing polymer materials used for patching, and necessary incidentals shall be included in the cost of bridge deck patching, partial depth.

The cost of all re-cleaning of suspect areas or verification through tests that the altered cleaning method is acceptable shall be included in the cost of the pay items of this section.

All costs associated with cleaning the concrete surface by shot blasting, milling, mechanical brooming, vacuuming, sounding, verification testing, removal of any joint or crack sealants, removal of excess aggregate, warranting the performance of the two-coat polymer overlay system on a bridge deck surface, keeping and furnishing records, removal and disposal of all waste materials, and furnishing all equipment, labor, materials, and incidentals to perform the work described herein shall be included in the cost of the warranted polymer overlay, bridge deck or polymer overlay, other concrete surface pay items.

The cost of all labor and materials for the placement or repair of type I-A joints shall be included in the cost of the warranted polymer overlay, bridge deck pay item.

The cost of returning a minimum of 7 days after work is completed and cleaning up loose aggregate and reapplying pavement markings shall be included in the cost of the pay items of this section.

738.19 Final Warranty Acceptance

At the end of the warranty period, the Engineer will review the project in the field for the presence of any of the condition parameters in 738.14(c)1 and, provided none are observed, will recommend a Final Warranty Acceptance. The Department will issue the Contractor a Final Warranty Acceptance letter upon completion of the warranty period and all required remedial work.

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SECTION 904, AFTER LINE 167, INSERT AS FOLLOWS:

(h) For Polymer Overlay System

Fine aggregate for all layers of the polymer overlay system shall be selected from the Department's QPL of Polymers and Aggregates for Overlay Systems and shall be comprised of one of the following:

1. Aluminum oxide
2. Basalt
3. Calcined bauxite
4. Crushed granite
5. Flint
6. Glacial gravel
7. Rhyolite.

The aggregate shall also be in accordance with 904.02, shall be clean and dry, and free of dirt, clay, asphalt, and other foreign or organic materials, and shall comply with the following properties.

<i>Physical Property</i>	<i>Test Method</i>	<i>Requirement</i>
<i>Fine Aggregate Angularity (min.)</i>	<i>AASHTO T 304, Method A</i>	<i>45</i>
<i>Micro-Deval abrasion loss, % (max.)</i>	<i>ASTM D7428</i>	<i>11.0</i>
<i>Moisture content, % (max.)</i>	<i>AASHTO T 255</i>	<i>0.2</i>

The aggregate gradation shall be as follows.

1. Basalt Aggregate Gradation

Basalt aggregate gradation shall be in accordance with either the polymer overlay system manufacturer's gradation recommendation or shall meet the following gradation:

<i>Sieve Sizes</i>	<i>% Passing by Weight</i>
<i>No. 4 (4.75 mm)</i>	<i>100</i>
<i>No. 8 (2.36 mm)</i>	<i>30 to 75</i>
<i>No. 16 (1.18 mm)</i>	<i>1 to 5</i>
<i>No. 30 (600 μm)</i>	<i>0 to 1</i>

2. Gradation of Other Aggregates

Aluminum oxide, calcined bauxite, crushed granite, flint, glacial gravel, or rhyolite shall be in accordance with either the polymer overlay system manufacturer's gradation recommendation or shall meet the following gradation:

<i>Sieve Sizes</i>	<i>% Passing by Weight</i>
<i>No. 4 (4.75 mm)</i>	<i>95 to 100</i>
<i>No. 6 (3.35 mm)</i>	<i>70 to 85</i>

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No. 10 (2 mm)	15 to 35
No. 20 (850 μ m)	0 to 3

(hi) Sizes of Fine Aggregates

SECTION 904, BEGIN LINE 171, INSERT AS FOLLOWS:

(ij) Sampling and Testing

Sampling and testing shall be conducted in accordance with the following AASHTO, *ASTMs*, and ITMs.

SECTION 904, AFTER LINE 184, INSERT AS FOLLOWS:

*Resistance of Fine Aggregate to Abrasion/Micro-Deval**ASTM D7428

SECTION 904, BEGIN LINE 359, INSERT AS FOLLOWS:

904.06 Exceptions to AASHTO and ASTM Standard Methods

SECTION 904, AFTER LINE 419, INSERT AS FOLLOWS:

(f) Exceptions to ASTM D7428

Modify section 8.2 of ASTM D7428. Aggregate for the test sample will consist of material passing the 4.75 mm sieve and retained on the 1.18 mm sieve. An oven dried sample of 500 \pm 5 g will be prepared as follows:

Passing	Retained	Mass
No. 4 (4.75 mm)	No. 8 (2.36 mm)	250 g
No. 8 (2.36 mm)	No. 16 (1.18 mm)	250 g

SECTION 909, AFTER LINE 407, INSERT AS FOLLOWS:

909.13 Polymer for Polymer Overlay Systems

The polymer shall be in accordance with the following criteria in order to be included on the Department's QPL for Polymers and Aggregates for Overlay Systems. The polymer shall be a two-component material consisting of a resin base and hardener in accordance with ASTM C881, Type III, Grade 1, Class C and the table below.

Property	Test Method	Value
Epoxide equivalent	ASTM D1652	270 max.
Gel Time, minutes	ASTM C881, modified (70 ml sample in unwaxed paper cup)	15 to 45 at 75°F (23.9°C)
Tensile strength	ASTM D638	13.8 MPa (2,000 psi) at min. of 7 days of cure time
Tensile elongation	ASTM D638	30 to 70 % at max. of 24 h of cure time
Water absorption	ASTM D570	0.50 % max. increase by weight

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<i>Viscosity</i>	<i>ASTM D2196 (Spindle No. 3 at 20 RPM)</i>	<i>15 ±5 poise</i>
<i>Compressive strength at 3 h, minimum</i>	<i>ASTM C579, Method B, modified to be reported at 3 h</i>	<i>1,000 psi</i>
<i>Compressive strength at 24 h, minimum</i>	<i>ASTM C579, Method B, modified to be reported at 24 h (With plastic inserts. Aged in air at a temperature of 73 ±4°F)</i>	<i>5,000 psi</i>
<i>Volatile content</i>	<i>ASTM D1259, Method B for mix system</i>	<i>Report the values</i>

APPROVED MINUTES

COMMENTS AND ACTION

738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS

DISCUSSION:

This item was introduced and presented by Mr. Reilman who explained that the need has arisen for the Department to address removing an existing polymeric overlay from a bridge deck. Also, the requirement to mill an existing concrete surface is now believed to be unnecessary.

Mr. Reilman proposed to incorporate the proposed additions to address removal of an existing polymeric overlay. Also, remove the requirements to mill an existing concrete surface as the surface preparation necessary to achieve the required surface profile is sufficient. Minor editorial revisions are as shown.

There was no further discussion and this item passed as submitted.

<p>Motion: Mr. Reilman Second: Mr. Pelz Ayes: 10 Nays: 0 FHWA Approval: YES</p>	<p>Action:</p> <p><input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn</p>
<p>2022 Standard Specifications Sections referenced and/or affected: Section 738 proposed new; 904 begin pg. 998; 909 pg. 1045.</p> <p>Recurring Special Provisions or Plan Details: 738-B-297 WARRANTED POLYMER OVERLAY SYSTEM FOR BRIDGE DECK SURFACES AND POLYMER OVERLAY SYSTEM FOR NON-BRIDGE DECKS</p> <p>Standard Drawing affected: NONE</p> <p>Design Manual Sections affected: Figure 502-2C</p> <p>GIFE Sections cross-references: NONE</p>	<p><input type="checkbox"/> 2024 Standard Specifications <input checked="" type="checkbox"/> Revise Pay Items List</p> <p><input type="checkbox"/> Create RSP (No. __) Effective:</p> <p><input checked="" type="checkbox"/> Revise RSP (No. 738-B-297) Effective: March 1, 2023</p> <p><input type="checkbox"/> Standard Drawing Effective:</p> <p><input type="checkbox"/> Create RPD (No. __) Effective:</p> <p><input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input checked="" type="checkbox"/> SiteManager Update</p>

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: There has apparently been some confusion regarding the maximum size of riprap.

PROPOSED SOLUTION: Add an additional clarifying phrase to the riprap materials section in 904.05.

APPLICABLE STANDARD SPECIFICATIONS: 904.05

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: 904-M-059

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc: Mark Bailey, Keith Lytton, Jim Reilman

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: incorporate this change in to existing RSP 904-M-059

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 8/18/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? N/A

Construction time? N/A

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? N/A

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2022 STANDARD SPECIFICATIONS

SECTION 904 - AGGREGATES

904.04 Riprap

The Standard Specifications are revised as follows:

SECTION 904, BEGIN LINE 342, INSERT AS FOLLOWS:

(f) Sizes of Riprap

Gradation Requirements					
Percent Smaller					
Size, in.	Revetment	Class 1	Class 2	Uniform A	Uniform B
30			100		
24		100	85 - 100		
18	100	85 - 100	60 - 80		
12	90 - 100	35 - 50	20 - 40		
8				100	
6	20 - 40	10 - 30	0 - 20	35 - 80	95 - 100
3	0 - 10	0 - 10	0 - 10		35 - 80
1				0 - 20	0 - 20
Depth of Riprap, min.	18 in.	24 in.	30 in.		

The maximum dimension of individual pieces shall not be greater than three times the minimum dimension *and no dimension shall exceed the maximum size listed for the respective size of riprap*. The riprap will be visually inspected for size, shape, and consistency.

COMMENTS AND ACTION

904.04(f) Sizes of Riprap

DISCUSSION:

Mr. Reilman introduced and presented this item stating that there has apparently been some confusion regarding the maximum size of riprap.

Mr. Reilman proposed to add an additional clarifying phrase to the riprap materials section in 904.05.

There was no further discussion and this item passed as submitted.

	<u>Action:</u>
Motion: Mr. Reilman Second: Mr. Pelz Ayes: 10 Nays: 0 FHWA Approval: YES	<input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 904.04(f) pg. 1007. Recurring Special Provisions or Plan Details: 904-M-059 AGGREGATES	<input checked="" type="checkbox"/> 2024 Standard Specifications Revise Pay Items List <input type="checkbox"/> Create RSP (No. __) Effective:
Standard Drawing affected: NONE	<input checked="" type="checkbox"/> Revise RSP (No. 904-M-059) Effective: <u>March 1, 2023</u>
Design Manual Sections affected: NONE	<input type="checkbox"/> Standard Drawing Effective:
GIFE Sections cross-references: NONE	<input type="checkbox"/> Create RPD (No. __) Effective: <input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The procedure for getting a new Sound Barrier System considered for inclusion on the QPL is missing from the RSP.

PROPOSED SOLUTION: Add a sentence informing folks of the procedure for getting a Sound Barrier System considered for inclusion on the QPL.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: RSP 620-R-483

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: None

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
same as existing RSP 620-R-483

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 8/24/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? N/A

Construction time? N/A

Customer satisfaction? Yes

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? N/A

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? Yes

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO SPECIAL PROVISIONS

620-R-483 SOUND BARRIER SYSTEMS

Note: Only sections with proposed changes highlighted gray are shown.
Currently used RSP:

620-R-483	Sound Barrier Systems	rev. 10/21/21	eff. 03/01/22
620-R-483	Sound Barrier Systems	rev. 06/16/22	eff. 12/01/22

[---]

620.02 General Design Requirements

The sound barrier system shall be either wall mounted, bridge mounted or ground mounted, and shall consist of wall attachments or post foundations, vertical support posts, and sound barrier panels. For the purposes of this section, "panel" is defined as the reflective or absorptive component mounted between the posts, piers or columns.

All appurtenances behind, in front of, under, over, mounted upon, or passing through the wall, including drainage structures, fire hydrant access openings, highway signage, emergency access openings, utilities or other appurtenances shown on the plans, shall be accounted for in the design of the sound barrier system.

If the sound barrier manufacturer needs additional information to complete the design, the Contractor shall be responsible for obtaining such information. The Contractor shall be responsible for field verifying wall locations in areas of all existing traffic poles, utility poles, roadway lighting poles, drainage pipes, underdrain outlets, and bridge expansion joints and all other locations where the sound barrier system may conflict with existing conditions. The wall shall be realigned and designed to box out openings where conflicts occur with existing light poles and traffic control devices. The Contractor shall establish and account for the existing locations of all underdrain outlets, drainage pipes, and bridge expansion joints in the final wall plans. If the Contractor discovers that overhead utilities will be within 6 ft of the sound barrier, the Contractor shall notify the Engineer in accordance with 104.02 and 105.16.

The sound barrier wall design shall follow the general dimensions of the wall envelope as shown on the plans. The top of the sound barrier shall be at or above the acoustical profile line shown, unless noted. Changes in elevation shall be accomplished by stepping the sound barrier sections at the vertical support posts. Steps shall not exceed 3 ft vertically unless otherwise specified in the plans. Barrier heights shall be selected in groups of no fewer than three successive panels, except where barriers are to be stepped down for barrier termination. The ends of the sound barrier shall be tapered or stepped down to a height of 8 ft within the sound barrier end transitions or as shown on the plans. The bottom of ground mounted sound barrier shall be embedded a minimum of 6 in. into the ground. The bottom of wall mounted or bridge mounted sound barrier shall follow within 3 in. a profile 6 in. below the top of the existing concrete barrier railing or wall.

Caisson footings, vertical support posts, and connections for ground mounted sound barrier shall be designed as specified by the manufacturer, with minimum post spacing of 15 ft. Exceptions will be allowed due to site-specific conditions such as access

REVISION TO SPECIAL PROVISIONS

620-R-483 SOUND BARRIER SYSTEMS

doors, drainage requirements or utility accommodations. These shall be reviewed and approved through the working drawing process. The foundation design shall use the COM 624P or LPILE Program. The foundation design shall be based on the soil model shown on the plans based on cyclic loading and shall consider the effects of a sloping ground surface. The post deflection shall be limited to $L/100$, measured from the top of the caisson to the top of the wall. The foundation depth shall not be less than 7.5 ft and shall not exceed the depth of the soil model except where the Contractor elects to drill deeper borings to extend the model. The foundation diameter shall not be less than 18 in. and shall not be less than 6 in. larger than the diagonal dimension of the post being used. The foundation shall be designed by the sound barrier manufacturer. Vertical support posts shall be attached to caisson footings by means of anchor bolts, or embedded wide flange steel posts.

A sound barrier system shall be selected for the type specified from those which are on the QPL of Sound Barrier Systems. The materials used in the fabrication of the sound barrier system shall be the same as those used for qualification of the sound barrier system. Sound Barrier Systems may be considered for addition to the QPL by completing the requirements of ITM 806, Procedure N.

The structural design of the sound barrier system shall be in accordance with the AASHTO LRFD Bridge Design Specifications, except as otherwise directed.

The post spacing for sound barriers mounted on any structure or safety barrier shall be limited to a distance that does not overstress the structure or safety barrier. The spacing shall also be limited to a distance that allows the sound barrier to conform to the existing horizontal and vertical alignments. The allowable loads on a structure or barrier shall be as shown on the plans. If no allowable loads are shown, the allowable loads on a sound barrier shall be in accordance with the AASHTO LRFD Bridge Design Specifications.

COMMENTS AND ACTION

620-R-483 SOUND BARRIER SYSTEMS

DISCUSSION:

This item was introduced and presented by Mr. Reilman who pointed out that the procedure for getting a new Sound Barrier System considered for inclusion on the QPL is missing from the RSP.

Mr. Reilman proposed to add a sentence informing of the procedure for getting a Sound Barrier System considered for inclusion on the QPL, as shown above.

There was no further discussion and this item passed as submitted.

	<u>Action:</u>
Motion: Mr. Reilman	
Second: Mr. Pelz	
Ayes: 10	<input checked="" type="checkbox"/>
Nays: 0	<input type="checkbox"/>
FHWA Approval: Yes	<input type="checkbox"/>
2022 Standard Specifications Sections referenced and/or affected: NONE	<input type="checkbox"/> 2024 Standard Specifications <input type="checkbox"/> Revise Pay Items List
Recurring Special Provisions or Plan Details: 620-R-483 SOUND BARRIER SYSTEMS	<input type="checkbox"/> Create RSP (No. __) Effective:
Standard Drawing affected: NONE	<input checked="" type="checkbox"/> Revise RSP (No. <u>620-R-483</u>) Effective: <u>March 1, 2023</u>
Design Manual Sections affected: NONE	<input type="checkbox"/> Standard Drawing Effective:
GIFE Sections cross-references: NONE	<input type="checkbox"/> Create RPD (No. __) Effective:
	<input type="checkbox"/> GIFE Update
	<input type="checkbox"/> Frequency Manual Update
	<input type="checkbox"/> SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED:

The use of slag cement in structural concrete is limited by ambient temperature. The current minimum temperature is 50°F. Industry expressed concern that the temperature excessively limits the overall season for using slag cement. They typically will not begin stocking slag cement in the spring until they are certain it can be used above the minimum temperature. Lowering the minimum temperature to 45°F will provide industry with a wider season for using slag cement without exceeding the practical limitations of the material.

PROPOSED SOLUTION:

The minimum ambient temperature when using slag cement will be changed from 50°F to 45°F.

APPLICABLE STANDARD SPECIFICATIONS: 702

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: none

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: add to existing RSP 702-R-739

PAY ITEMS AFFECTED: none

APPLICABLE SUB-COMMITTEE ENDORSEMENT: INDOT-IRMCA working committee (discussed 8-11-22)

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: 317-522-9692

Date: 08/24/22

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? N/A

Construction time? Yes

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? N/A

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? No

Can this item improve/reduce the number of potential change orders? No

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: N/A

REVISION TO 2022 STANDARD SPECIFICATIONS

SECTION 702 – STRUCTURAL CONCRETE

702.05 Proportioning

The Standard Specifications are revised as follows:

SECTION 702, BEGIN LINE 111, DELETE AND INSERT AS FOLLOWS:

Blended portland pozzolan cements, fly ash, and slag cement may be used in concrete when the ambient temperature is above ~~50~~45°F during the entire placement period. Immediately following placement, the average ambient temperature shall be above ~~50~~45°F for the entire curing period.

APPROVED MINUTES

COMMENTS AND ACTION

702.05 Proportioning

DISCUSSION:

Mr. Reilman introduced and presented this item stating that the use of slag cement in structural concrete is limited by ambient temperature. The current minimum temperature is 50°F. Industry expressed concern that the temperature excessively limits the overall season for using slag cement. They typically will not begin stocking slag cement in the spring until they are certain it can be used above the minimum temperature. Lowering the minimum temperature to 45°F will provide industry with a wider season for using slag cement without exceeding the practical limitations of the material.

Mr. Reilman proposed to change the minimum ambient temperature when using slag cement from 50°F to 45°F.

There was no further discussion and this item passed as submitted.

	<u>Action:</u>
Motion: Mr. Reilman Second: Mr. Pelz Ayes: 10 Nays: 0 FHWA Approval: YES	<input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
2022 Standard Specifications Sections referenced and/or affected: 702.05 pg.620.	<input checked="" type="checkbox"/> 2024 Standard Specifications <input type="checkbox"/> Revise Pay Items List <input type="checkbox"/> Create RSP (No. __) Effective:
Recurring Special Provisions or Plan Details: 702-R-739 STRUCTURAL CONCRETE AND USE OF OPTIMIZED AGGREGATE GRADATION IN CONCRETE	<input checked="" type="checkbox"/> Revise RSP (No. 702-R-739) Effective: March 1, 2023
Standard Drawing affected: NONE	<input type="checkbox"/> Standard Drawing Effective:
Design Manual Sections affected: NONE	<input type="checkbox"/> Create RPD (No. __) Effective:
GIFE Sections cross-references: NONE	<input checked="" type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update