INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N758 CM
Indianapolis, Indiana 46204

www.in.gov/indot

Eric Holcomb, Governor
Joe McGuinness, Commissioner

FINAL DRAFT MINUTES

November 19, 2020 Standards Committee Meeting

(Changes to the Agenda by the Action of the Committee shown as highlighted in yellow. Based on comments received, changes to the First Draft are shown highlighted green and are on pages 14 and 17.)

December 11, 2020

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the November 19, 2020 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Pankow, Chair, at 01:00 p.m. on November 19, 2020, virtually via *Teams* (Microsoft application). The meeting was adjourned at 02:34 pm.

The following committee members were in a virtual attendance:

Gregory Pankow, Chairman, Director, Construction Management
John Wooden, Contract Administration Division
Dave Boruff, Traffic Engineering
Mark Orton, Bridge Design Division
Joseph Novak, Construction Management
Kumar Dave, Pavement Engineering, Highway Design
Jim Reilman, Materials and Tests Division
Michael Koch, District Construction, Fort Wayne District
Elena Veksler, Highway Design and Technical Support
Kurt Pelz, Construction Technical Support
Louis Feagans, Statewide Technical Services

The following items were discussed:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

1. *Approval of the Minutes from the September 17, 2020 meeting*

DISCUSSION: Mr. Pankow requested a motion to approve the Minutes from the September 17, 2020 meeting.

Motion: Mr. Reilman
Second: Mr. Novak
Ayes: 10
Nays: 0

ACTION: PASSED AS SUBMITTED

2. *Schedule of SC meetings, proposals submittals, and distributions of the Agendas and the Minutes in 2021 (Mr. Trammell) pg 5.*

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

(No items were listed)

C. STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS PROPOSED ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

Item No. 1 Mr. Reilman pg 6

2020 Standard Specifications:

601.02	Materials
601.13	Method of Measurements
601.14	Basis for Payment
904.03(e)	Sizes of Coarse Aggregates

ACTION: PASSED AS SUBMITTED

Item No. 2 — Mr. Reilman — pg 11

2020 Standard Specifications:

SECTION 219	*CEMENT STABILIZED SUBGRADE SOIL*

ACTION: PASSED AS REVISED

Item No. 3 — Mr. Orton — pg 19

Standard Drawings:

E 609-RCBA-01 thru 04	REINFORCED CONCRETE BRIDGE APPROACH (changes to E 609-RCBA-04 only)
E 609-TBAE-01 thru 03	RCBA EXTENSION FOR BRIDGE RAILING TRANSITION

ACTION: PASSED AS SUBMITTED

Item No. 4 — Mr. Boruff — pg 34

2020 Standard Specifications:

923.01	Temporary Pavement Marking Tape

ACTION: PASSED AS SUBMITTED

Item No. 5 — Mr. Reilman — pg 38

Recurring Special Provision:

503-R-692	JOINTS

ACTION: PASSED AS SUBMITTED

Item No. 6 — Mr. Reilman — pg 46

2020 Standard Specifications:

SECTION 218	*QC/QA SOIL EMBANKMENT AND QC/QA SUBGRADE*

ACTION: WITHDRAWN

Item No. 7 — Mr. Orton — pg 53

2020 Standard Specifications:

111.12	Basis of Payment
702.15	Joints
SECTION 724	STRUCTURAL EXPANSION JOINTS
906.07	Bridge Expansion Joints

Recurring Special Provision

503-R-692	JOINTS

ACTION: PASSED AS SUBMITTED

Item No. 8 Mr. Orton pg 67

2020 Standard Specifications:

702.03	Materials
702.15	Joints
702.28	Basis of Payment
707.12	Basis of Payment
906.01	Joint Fillers
906.03	Blank

ACTION: PASSED AS SUBMITTED

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cc: Committee Members
FHWA
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Schedule of SC meetings, proposals submittals, and distributions of the Agendas and the Minutes in 2021

Standards Committee Meeting Date	Agenda Items Due [1]	Agenda Distributed and Published	First Draft Minutes Distributed	Comments Due for Draft Minutes	Final Draft Minutes Distributed	Approved Minutes Published
	(- 24 days)	(- 17 days)	(+ 6 days)	(+ 13 days)	(+ 21 days)	(+ 35 - 42 days)
Thursday, December 17, 2020	Monday, November 23, 2020	Tuesday, December 01, 2020	Wednesday, December 23, 2020	Wednesday, December 30, 2020	Thursday, January 07, 2021	Thursday, January 28, 2021
Thursday, January 21, 2021	Monday, December 28, 2020	Monday, January 04, 2021	Wednesday, January 27, 2021	Wednesday, February 03, 2021	Thursday, February 11, 2021	Thursday, February 25, 2021
Thursday, February 18, 2021	Monday, January 25, 2021	Monday, February 01, 2021	Wednesday, February 24, 2021	Wednesday, March 03, 2021	Thursday, March 11, 2021	Thursday, March 25, 2021
Thursday, March 18, 2021	Monday, February 22, 2021	Monday, March 01, 2021	Wednesday, March 24, 2021	Wednesday, March 31, 2021	Thursday, April 08, 2021	Thursday, April 22, 2021
Thursday, April 15, 2021	Monday, March 22, 2021	Monday, March 29, 2021	Wednesday, April 21, 2021	Wednesday, April 28, 2021	Thursday, May 06, 2021	Thursday, May 27, 2021
Thursday, May 20, 2021	Monday, April 26, 2021	Monday, May 03, 2021	Wednesday, May 26, 2021	Wednesday, June 02, 2021	Thursday, June 10, 2021	Thursday, June 24, 2021
Thursday, June 17, 2021	Monday, May 24, 2021	Tuesday, June 01, 2021	Wednesday, June 23, 2021	Wednesday, June 30, 2021	Thursday, July 08, 2021	Thursday, July 22, 2021
Thursday, July 15, 2021	Monday, June 21, 2021	Monday, June 28, 2021	Wednesday, July 21, 2021	Wednesday, July 28, 2021	Thursday, August 05, 2021	Thursday, August 26, 2021
Thursday, August 19, 2021	Monday, July 26, 2021	Monday, August 02, 2021	Wednesday, August 25, 2021	Wednesday, September 01, 2021	Thursday, September 09, 2021	Thursday, September 23, 2021
Thursday, September 16, 2021	Monday, August 23, 2021	Monday, August 30, 2021	Wednesday, September 22, 2021	Wednesday, September 29, 2021	Thursday, October 07, 2021	Thursday, October 28, 2021
Thursday, October 21, 2021	Monday, September 27, 2021	Monday, October 04, 2021	Wednesday, October 27, 2021	Wednesday, November 03, 2021	Friday, November 12, 2021	Wednesday, November 24, 2021
Thursday, November 18, 2021	Monday, October 25, 2021	Monday, November 01, 2021	Wednesday, November 24, 2021	Wednesday, December 01, 2021	Thursday, December 09, 2021	Wednesday, December 22, 2021
Thursday, December 16, 2021	Monday, November 22, 2021	Wednesday, December 01, 2021	Wednesday, December 22, 2021	Wednesday, December 29, 2021	Thursday, January 06, 2022	Thursday, January 27, 2022

Notes:

Agenda items must be submitted by the due date shown, and be accompanied by a Proposal sheet.

The February" meeting is the last opportunity for the approval of the Standard Drawings effective on September 1, 2021 and revisions to the Standard Specifications 2022.

Shaded dates are exceptions to the regular schedule.

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Occasionally there is a need to require pea gravel for use in pile sleeves, gravel barrel impact attenuators, and other miscellaneous areas. Currently there is no defined material classified as pea gravel in the specifications.

PROPOSED SOLUTION: Create and define a gradation for pea gravel in the specifications that is suitable for use for the applications mentioned above.

APPLICABLE STANDARD SPECIFICATIONS: 601, 904

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: Yes

APPLICABLE SECTION OF GIFE: No

APPLICABLE RECURRING SPECIAL PROVISIONS: create new RSP

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: Jim Reilman, Pete White, Bart Williamson, Indiana Mineral Aggregate Association

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT, Office of Materials & Tests

Phone Number: 317-522-9692

Date: 10/7/2020

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? 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? N/A

Design process? Yes

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 STANDARD SPECIFICATIONS

SECTION 601 - INCIDENTAL CONSTRUCTION
601.02 Materials
601.13 Method of Measurements
601.14 Basis for Payment
SECTION 904 - AGGREGATES
904.03(e) Sizes of Coarse Aggregates

(Note: Proposed changes shown highlighted gray)

xxx-x-xxx PEA GRAVEL

(Adopted xx-xx-xx)

The Standard Specifications are revised as follows:

SECTION 601, BEGIN LINE 32, DELETE AND INSERT AS FOLLOWS:

Barrels used in impact attenuators shall be yellow with black lids. The *coarse* aggregate used in the barrels shall be ~~uncrushed gravel~~*size 93PG,* class F or higher, in accordance with 904~~ and the following gradation requirements~~.

~~Sieve Size~~	~~% Passing~~
~~1/2 in. (12.5 mm)~~	~~100~~
~~No. 50 (300 µm)~~	~~0 - 5~~
~~No. 100 (150 µm)~~	~~0 - 2~~

All other impact attenuators shall have end reflectorization as shown on the plans or attached to the nose of the attenuator in accordance with the attenuator manufacturer's recommendation.

SECTION 601, AFTER LINE 259, INSERT AS FOLLOWS:

Aggregate used to fill gravel barrel impact attenuators will not be measured for payment.

SECTION 601, BEGIN LINE 353, INSERT AS FOLLOWS:

The cost of earthwork, grading, and transition panel if required, and PCC pad shall be included in the cost of *the* impact attenuator. *The cost of aggregate used to fill gravel barrel impact attenuators shall be included in the cost of the impact attenuator.*

SECTION 904, BEGIN LINE 274, INSERT AS FOLLOWS:

(e) Sizes of Coarse Aggregates

REVISION TO STANDARD SPECIFICATIONS

SECTION 601 - INCIDENTAL CONSTRUCTION
601.02 Materials
601.13 Method of Measurements
601.14 Basis for Payment
SECTION 904 - AGGREGATES
904.03(e) Sizes of Coarse Aggregates

Sieve Sizes	Coarse Aggregate Sizes (Percent Passing)											
	Coarse Graded										Dense Graded	
	2	5	8	9	11, SC 11[5]	12, SC 12[5]	SC 16[5]	43[1]	91	*93PG*[6]	53[1]	73[1]
4 in. (100 mm)												
3 1/2 in. (90 mm)												
2 1/2 in. (63 mm)	100											
2 in. (50 mm)	80 - 100											
1 1/2 in. (37.5 mm)		100						100			100	
1 in. (25 mm)	0 - 25	85 - 98	100					70 - 90	100		80 - 100	100
3/4 in. (19 mm)	0 - 10	60 - 85	75 - 95	100				50 - 70			70 - 90	90 - 100
1/2 in. (12.5 mm)	0 - 7	30 - 60	40 - 70	60 - 85	100	100	100	35 - 50		*98 - 100*	55 - 80	60 - 90
3/8 in. (9.5 mm)		15 - 45	20 - 50	30 - 60	75 - 95	95 - 100	94 - 100			*75 - 100*		
No. 4 (4.75 mm)		0 - 15	0 - 15	0 - 15	10 - 30	50 - 80	15 - 45	20 - 40		*10 – 60*	35 - 60	35 - 60
No. 8 (2.36 mm)		0 - 10	0 - 10	0 - 10	0 - 10	0 - 35		15 - 35		*0 – 15*	25 - 50	
No. 16 (1.18 mm)							0 - 4					
No. 30 (600 µm)						0 - 4		5 - 20		*0 – 5*	12 - 30	12 - 30
No. 200 (75 µm)[2]								0 - 6.0			5.0 - 10.0[4]	5.0 - 12.0
Decant (PCC)[3]		0 - 1.5	0 - 1.5	0 - 1.5	0 - 1.5	0 - 1.5			0 - 1.5			
Decant (Non-PCC)	0 - 2.5	0 - 2.5	0 - 3.0	0 - 2.5	0 - 2.5	0 - 2.0			0 - 2.5	*0 – 2.0*		
Decant (SC)					0 - 1.5	0 - 1.5	0 - 1.5					

Notes:
(1) The liquid limit shall not exceed 25 (35 if slag) and the plasticity index shall not exceed 5. The liquid limit shall be determined in accordance with AASHTO T89 and the plasticity index in accordance with AASHTO T90.
(2) Includes the total amount passing the No. 200 (75 µm) sieve as determined by AASHTO T11 and AASHTO T27.
(3) Decant may be 0 - 2.5 for stone and slag.
(4) When slag is used for separation layers as defined in 302.01, the total amount passing the No. 200 (75 µm) sieve shall be 10.0 to 12.0.
(5) Seal coat (SC) aggregates shall be 85% one face and 80% two face crushed. The Flakiness Index in accordance with ITM 224 shall be a maximum of 25%.
(6) Pea gravel shall be generally uncrushed gravel, with a maximum of 20% crushed particles, and shall meet the gradation requirements of 93PG. Determination of crushed particles shall be made from the weight (mass) of material retained on the No. 4 (4.75 mm) sieve in accordance with ASTM D5821.

COMMENTS AND ACTION

601.02 Materials
601.13 Method of Measurements
601.14 Basis for Payment
904.03(e) Sizes of Coarse Aggregates

DISCUSSION:

This item was introduced and presented by Mr. Reilman who stated that occasionally there is a need to require pea gravel for use in pile sleeves, gravel barrel impact attenuators, and other miscellaneous areas. Currently there is no defined material classified as pea gravel in the specifications.

Mr. Reilman therefore proposed to create and define a gradation for pea gravel in the specifications that is suitable for use for the applications mentioned above.

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

Motion: Mr. Reilman Second: Mr. Koch Ayes: 10 Nays: 0 FHWA Approval: Yes	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 601.02 pg 447, 601.13, and 601.14 pg 452 -453. 904.03(e) pg 952. Recurring Special Provision references in: PROPOSED TO CREATE NEW Standard Drawing affected: NONE Design Manual Sections affected: YES GIFE Sections cross-references: NONE	X 2022 Standard Specifications ___ Revise Pay Items List X Create RSP (No .904-M-xxx) Effective: June 1, 2021 RSP Sunset Date: 2022 SS book ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update X SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Several cement stabilized subgrade soils have been completed recently and this treatment increases the pavement and subgrade. life. Subgrade strength are several times higher and deflection would be lower. The results would be longer pavement life. This is QC/QA specification and requirements are different from other specifications.

PROPOSED SOLUTION: This needs a separate section.

APPLICABLE STANDARD SPECIFICATIONS: yes

APPLICABLE STANDARD DRAWINGS: yes

APPLICABLE DESIGN MANUAL SECTION: yes

APPLICABLE SECTION OF GIFE: yes

APPLICABLE RECURRING SPECIAL PROVISIONS: yes

PAY ITEMS AFFECTED: yes

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: Gary Fox, Jim Reilman, Nayyar Siddiki, and Industry

IMPACT ANALYSIS (attach report): NA

Submitted By: Jim Reilman for Gary Fox & Nayyar Siddiki

Title: State Materials Engineer

Organization: INDOT, Office of Materials & Tests

Phone Number: 317-522-9692

Date: 10/15/2020

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? No
- Customer satisfaction? Yes
- Congestion/travel time? NA
- Ride quality? Yes

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? NA
- Asset preservation? Yes
- Design process? NA

Will this change provide the contractor more flexibility? NA

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? No

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

The Standard Specifications are revised as follows:

SECTION 219, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 219 - CEMENT STABILIZED SUBGRADE SOIL

219.01 Description

This work shall consist of stabilizing 12 in. of subgrade soils by uniformly mixing portland cement to achieve the specified unconfined compressive strength in accordance with 105.03.

219.02 Materials

Materials shall be in accordance with the following:

Portland Cement, Type I..... 901.01(b)
Water..... 913.01

Note: Portland cement may be used dry or as a slurry.
Soils shall meet the requirements of 215.02.

CONSTRUCTION REQUIREMENTS

219.03 Construction Requirements

Construction requirements shall be in accordance with 207.03 and ~~the following~~as specified herein.

219.04 Testing and Mix Design

Testing and mix design shall be in accordance with 215.03. The Contractor shall be responsible for all tests required to determine the optimum cement content for producing cement stabilized subgrade soil with a minimum unconfined compressive strength of 300 psi at seven days. The quantities of portland cement shall be based on 6% of the maximum dry density of the soils. Laboratory testing and mix design shall be performed by an approved geotechnical consultant in accordance with the Department's Design Procedures for Soil Modification or Stabilization. The unconfined compressive strength test shall be performed in accordance with AASHTO T 208. Sulfate tests for water shall be performed in accordance with ASTM D516.

The mix design, test results, and the geotechnical consultant recommendations shall be submitted to the Engineer and to the Geotechnical Services Division for approval at least five business days prior to use.

The Contractor shall submit a QCP in accordance with ITM 803. The QCP shall address all of the testing requirements for the section as specified.

219.05 Storage and Handling

Storage and handling shall be in accordance with 215.04.

219.06 Weather Limitations

Weather limitations shall be in accordance with 215.05.

219.07 Preparation of Soils

Soil preparation shall be in accordance with 215.06. All rocks greater than 2 in. encountered before or after mixing the soils and chemical modifiers shall be removed.

When stabilization of foundation soils with cement is required in a cut or at-grade section, the top 12 in. of soil for cement stabilized subgrade soil shall be removed and stockpiled prior to constructing the 14 in. thick stabilization of foundation soils with cement. When the stabilization of foundation soils with cement is complete, the 12 in. of cement stabilized subgrade soil shall then be placed.

When stabilization of foundation soils with cement is required in a fill section, it shall be constructed prior to placement of the 12 in. of soil for cement stabilized subgrade soil.

219.08 Spreading and Mixing of Cement

Spreading of cement shall meet the requirements of 215.07. The soil, cement, and water shall be in accordance with 215.08.

Cement, soil, and water shall be mixed using a power-driven transverse type mixer equipped with a computer controlled volumetric water readout. Mixing shall continue until the cement is thoroughly incorporated into the soil and the mixed materials are a uniform color. Water shall be added in sufficient quantity to hydrate the cement. Water shall be introduced through the mixer to bring the mixed material to at least optimum moisture content. One hundred percent of the material, exclusive of rock particles, shall pass a 1 in. sieve and at least 80% shall pass a No. 4 sieve. Water shall not be added when the moisture content of the soil exceeds 3 percent above optimum moisture content. ~~Once the water is added to the mixture, complete the mixing and compaction~~The mixing and compaction shall be completed once the water has been added to the mixture. The mixing depth shall be 12 in. The moisture content shall be determined during soils cement mixing in accordance with ITM 506.

219.09 Compaction

Compaction of the mixture shall ~~be in accordance with 215.09 and as follows:~~begin as soon as practicable after mixing and shall be in accordance with 203 or 207.03 as applicable. Compaction after mixing shall be completed within 1 h of portland cement placement and grading, and final compaction shall be completed within 3 h after mixing.

Initial compaction equipment shall consist of a vibratory tamping-foot roller.

Final compaction shall be performed with a smooth drum roller.

219.10 Trimming

Stabilized soil shall be prepared, and adequate drainage shall be provided ~~in accordance with 207.03.~~at all times to prevent water from standing on the subgrade. The grade and cross section of the subgrade shall be finished within a tolerance of 1/2 in. from the subgrade elevation shown on the plans.

Even though the subgrade has been previously accepted, the condition of the subgrade shall be in accordance with 105.03 and 207.04 at the time paving material is placed.

Finishing within this tolerance by blading or other mechanical means without the use of side forms will be allowed. If these methods do not finish within this tolerance, side forms shall be used.

219.~~10~~11 QC Testing

QC testing shall be performed as follows:

(a) *QC testing for compaction of cement stabilized subgrade soils shall be performed on the finished grade with an LWD in accordance with 203.24(b) with the exception that the interval for LWD testing shall be every 1,000 sq yd. Testing for the cement stabilized subgrade soils shall begin seven days after compaction. Construction traffic or equipment exceeding 5 t in weight shall not be allowed on the treated soils until the area has passed LWD testing.*

(b) *Moisture testing of soil cement mixtures shall be performed in accordance with ITM 506 at every 1,000 sq yd during cement and soils mixing.*

(c) *One gradation test shall be performed for every 1,000 sq yd of cement modified soil. Gradation tests shall be performed in accordance with ITM 516.*

(d) *Two test specimens shall be prepared at 95% of the Standard Proctor and cured for seven days. Specimens shall be taken every 1,000 ft of length by lane width and shall be obtained by the Contractor. Unconfined compressive strength tests shall be performed in accordance with AASHTO T208. The sample of the cement stabilized soils mixture shall be taken during pulverization and mixing.*

(e) *Cement spread rate shall be checked at every 2,000 ft of length by lane width. Spread rate shall be in accordance with ITM 516.*

(f) The soil cement mixing depth shall be checked at every 2,000 ft of length by lane width in accordance with ITM 516 after mixing and prior to compaction.

(g) All ~~the~~ tests performed by the Contractor shall be compiled and submitted to the Engineer on a weekly basis for documentation of strengths obtained.

219.~~11~~12 Quality Assurance, QA, Testing

Moisture tests based on ITM 506 for soil cement mixtures will be performed at every ~~1~~2,000 ~~ft~~sq yd during cement and soils mixing.

Acceptance testing for compaction of cement stabilized subgrade soils will be performed on the finished grade with an LWD in accordance with 203.24(b) with the exception that the interval for LWD testing will be every 2,000 sq yd. The acceptance test for the cement stabilized subgrade soils will begin seven days after compaction. The allowable average deflection and maximum deflection for cement stabilized subgrade soil shall be in accordance with the following.

Material Type	*Allowable Average Deflection (mm)*	*Maximum Deflection at Single Test Location (mm)*
Cement Stabilized Subgrade Soil	*≤ 0.14*	*0.17*

219.~~12~~13 Curing

The surface shall be maintained in a moist condition with no visible dry areas for the first seven days after mixing with cement. Liquid membrane forming compound shall be applied in accordance with 504.04(a) to the surface and reapplied as applicable for the first seven days to aid in curing and prevent loss of moisture.

~~219.13 Trimming~~

~~Stabilized soil shall be prepared, and adequate drainage shall be provided in accordance with 207.03.~~

219.14 Proofrolling

The entire stabilized soil shall be proofrolled in accordance with 203.26. Deflection or ruts greater than 1/4 in. shall be corrected as directed.

219.15 Method of Measurement

The accepted cement stabilized subgrade soil will be measured by the square yard, complete in place.

~~Cement and liquid membrane forming compound will not be measured.~~

219.16 Basis of Payment

The accepted quantity of cement stabilized subgrade soil will be paid for at the contract unit price per square yard.

Approved adjustments for cement that exceed the limit of ~~section~~ 219.04 will be included in a change order for materials only and paid for as additional cement for subgrade soil stabilization. Payment for additional cement for subgrade soil stabilization will be made for direct delivered material costs incurred by the Contractor and will not include any other markups.

Payment will be made under:

Pay Item	***Pay Unit Symbol***
Cement Stabilized Subgrade Soil~~s~~ ..... SYS	

The cost of performing mix design, services of an approved geotechnical consultant, scarification of the soil, spreading and mixing of the cement and soil, compaction of the resultant mixture, shaping the soil, work required due to adjustments of modifier proportioning, work required due to weather conditions, correction of deficient areas, water required for the stabilization process, soil trimming, liquid membrane forming compound, and all operations needed to meet the requirements of this specification shall be included in the cost of the pay item.

COMMENTS AND ACTION

SECTION 219 - CEMENT STABILIZED SUBGRADE SOIL

DISCUSSION:

Mr. Reilman introduced and presented this item, assisted by Mr. Siddiki, who explained that several cement stabilized subgrade soils have been completed recently and this treatment increases the life of the pavement and subgrade. Subgrade strength has increased and the deflection has decreased. The results are longer pavement life. Mr. Dave stated that he has received positive feedback with regard to this special provision.

Mr. Reiman proposed to incorporate a new specification section which would be QC/QA and the requirements would differ from other specification sections.

Following a discussion between Mr. Reilman, Mr. Koch, Mr. Siddiki and Mr. Fox, prior to the meeting, the agreed upon revisions to this item are as shown highlighted above, along with other minor editorial revisions. Thanks to the sharp eye of Mr. Duncan, FHWA, the units shown in 219.12 have been corrected.

Mr. Koch inquired about the 2 in. rock requirement in 219.07, and Mr. Schneider, from industry, concurred that it is feasible.

There was no further discussion and Mr. Reilman revised his motion, and this item passed as revised.

Motion: Mr. Reilman Second: Mr. Dave Ayes: 10 Nays: 0 FHWA Approval: Yes	Action: ___ Passed as Submitted _X_ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: Proposed new section.	_X_ 2022 Standard Specifications ___ Revise Pay Items List
Recurring Special Provision references in: NONE	_X_ Create RSP (No.219-R-xxx) Effective: June 1, 2021 RSP Sunset Date: 2022 SS book
Standard Drawing affected: NONE	___ Revise RSP (No.___) Effective: RSP Sunset Date:
Design Manual Sections affected: NONE	___ Standard Drawing Effective:
GIFE Sections cross-references: NONE	___ Create RPD (No. ___) Effective:
	_X_ GIFE Update
	___ SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The reinforced concrete bridge approach (RCBA) extension for bridge railing transition drawing series (TBAE) hasn't been updated to reflect changes to the RCBA Standard Drawings that were implemented in 2014. As a result, the reinforcing in the TBAE series isn't consistent with the reinforcing in the RCBA series, which causes constructability concerns. The current TBAE series also lists several bridge railing types that are no longer INDOT standard bridge railing types. Also, the clearance from the top of the RCBA to the top layer of reinforcing bars was decreased from 2 1/2" to 2" when the RCBA Standard Drawings were revised in 2014. This has reduced the amount of protection for the reinforcing bars and has also increased the risk of snagging reinforcing bars during future milling and overlay operations.

PROPOSED SOLUTION: The TBAE series has been revised to: space the transverse bars with the typical transverse bars in the RCBA, revise the orientation of reinforcing mats to be consistent with the RCBA reinforcing, remove the hooks on the longitudinal bars to reduce congestion, update the width and length of the extensions to be consistent with the current bridge railing transitions, and increase the cover on the top layer of reinforcing to 2 1/2". The RCBA series has been revised to increase the cover on the top layer of reinforcing to 2 1/2", as well as some minor editorial changes.

APPLICABLE STANDARD SPECIFICATIONS: 609 (no changes required)
APPLICABLE STANDARD DRAWINGS: TBAE series (complete revision), RCBA series (changes to sheet 04 only)
APPLICABLE DESIGN MANUAL SECTION: 17-5.09(01 & 02) [no change needed]
APPLICABLE SECTION OF GIFE: N/A
APPLICABLE RECURRING SPECIAL PROVISIONS: N/A
PAY ITEMS AFFECTED: N/A

APPLICABLE SUB-COMMITTEE ENDORSEMENT: N/A

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

IMPACT ANALYSIS (attach report): Included

Submitted By: Pete White for Mark Orton
Title: Standards Engineer
Organization: INDOT Standards and Policy
Phone Number: 317-233-3840

Date: Oct. 20, 2020

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? 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? No
- For construction workers? No

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? No
- Design process? Yes

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? 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: The RCBA slab extension Standard Drawings are out of date and aren't consistent with the current RCBA Standard Drawings and current bridge railing standards.

REVISION TO STANDARD DRAWINGS

E 609-RCBA-01 INDEX AND GENERAL NOTES REINFORCED CONCRETE BRIDGE APPROACH (existing, no proposed changes)

INDEX	
SHEET NO.	SUBJECT
1	Reinforced Concrete Bridge Approach Index and General Notes
2	Reinforced Concrete Bridge Approach Square
3	Reinforced Concrete Bridge Approach Skewed
4	Reinforced Concrete Bridge Approach Section, Pavement Ledge, and Bar Bending Details

GENERAL NOTES:

1. All reinforcing bars shall be epoxy coated.
2. See Standard Drawing series E 609-TBAE for RCBA extensions used with bridge railing transitions.
3. RCBA shall be surface sealed.

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH
INDEX AND GENERAL NOTES

SEPTEMBER 2020

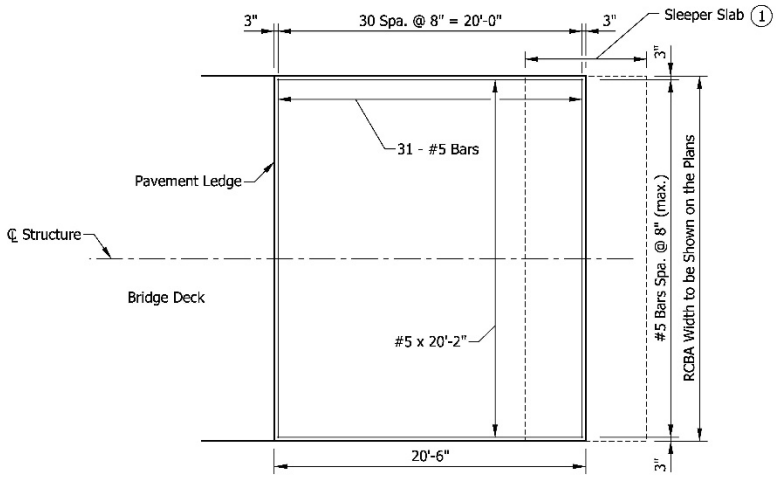
STANDARD DRAWING NO. E 609-RCBA-01

03/10/20
DESIGN STANDARDS ENGINEER DATE

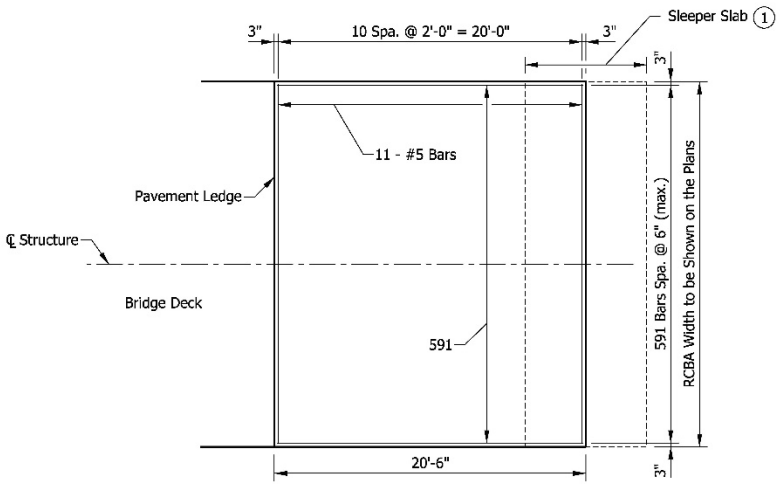
04/02/20
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-RCBA-02 REINFORCED CONCRETE BRIDGE APPROACH SQUARE (existing, no proposed changes)



PLAN SHOWING TOP REINFORCING



PLAN SHOWING BOTTOM REINFORCING

NOTES:

(1) When shown on the plans, see Standard Drawing series E 503-BATJ for terminal joint and sleeper slab details.

KEY:

RCBA = Reinforced Concrete Bridge Approach

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH SQUARE

SEPTEMBER 2020

STANDARD DRAWING NO. E 609-RCBA-02

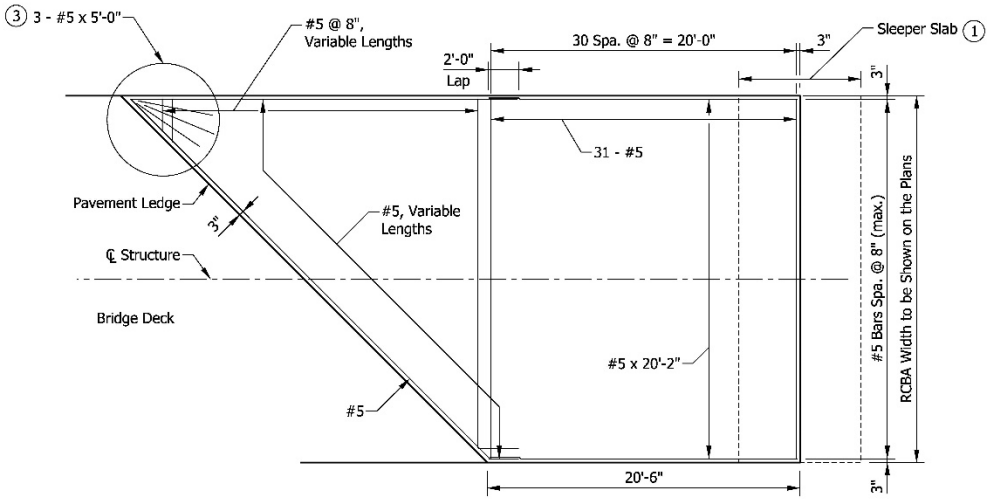
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

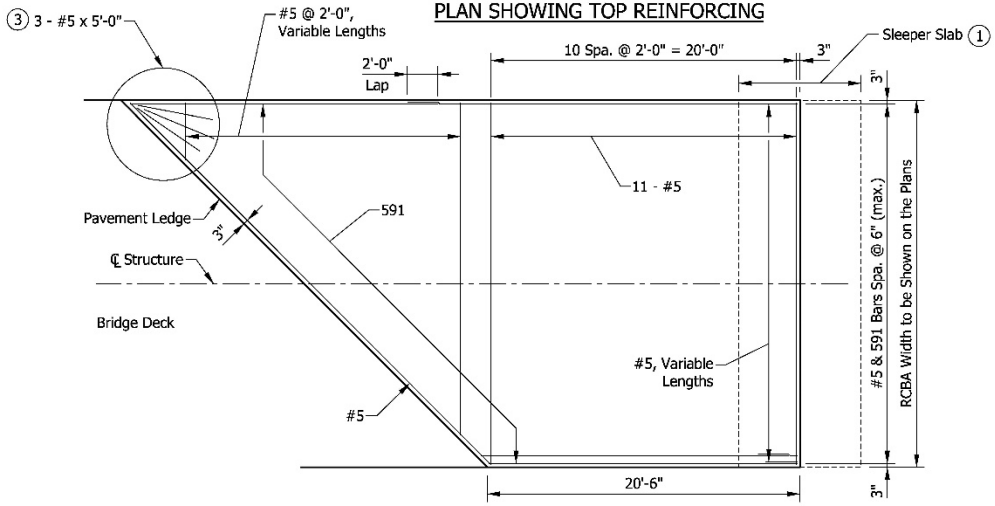
04/02/20
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-RCBA-03 REINFORCED CONCRETE BRIDGE APPROACH SKEWED (existing, no proposed changes)



PLAN SHOWING TOP REINFORCING



PLAN SHOWING BOTTOM REINFORCING

NOTES:

1. When shown on the plans, see Standard Drawing series E 503-BATJ for terminal joint and sleeper slab details.
2. Variable-length #5 bars shall be detailed by means of cutting diagrams on the plans.
3. For skew > 15 degrees where variable-length transverse bars would be shorter than 2 ft 0 in., a fanned configuration of three #5 x 5'-0" reinforcing bars shall be provided.

KEY:

RCBA = Reinforced Concrete Bridge Approach

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH SKEWED

SEPTEMBER 2020

STANDARD DRAWING NO. E 609-RCBA-03

ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

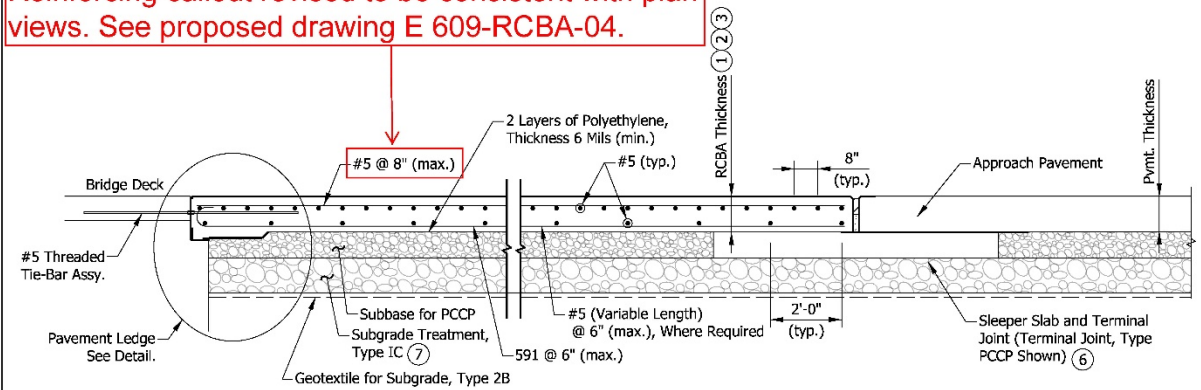
03/10/20
DESIGN STANDARDS ENGINEER DATE

04/02/20
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

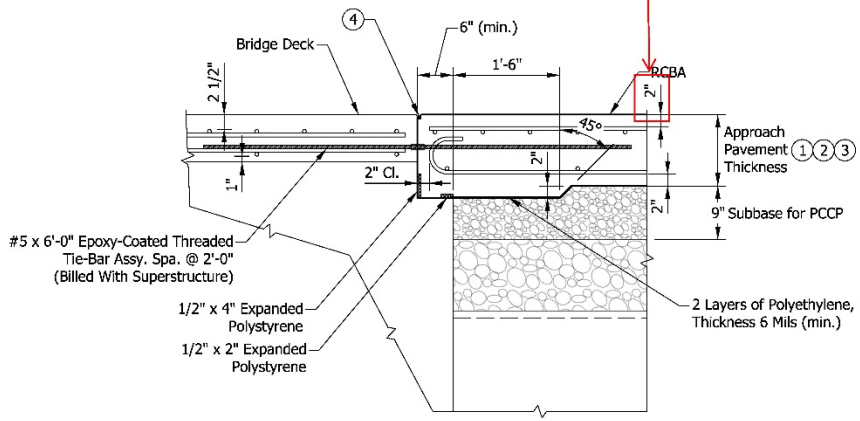
E 609-RCBA-04 REINFORCED CONCRETE BRIDGE APPROACH SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS (existing, with shown markups)

Reinforcing callout revised to be consistent with plan views. See proposed drawing E 609-RCBA-04.



SECTION THROUGH APPROACH

Top clear cover revised to match bridge deck. See proposed drawing E 609-RCBA-04.



PAVEMENT LEDGE DETAIL

NOTES:

(1) See plans for approach pavement thickness.

(2) For HMA approach pavement:
RCBA = 10 in. if design year AADT < 1000
RCBA = 12 in. if design year AADT ≥ 1000

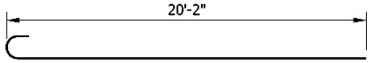
(3) For PCCP approach pavement:
RCBA = 12 in. if pavement thickness < 12 in.
RCBA = Same as pavement thickness, if pavement thickness ≥ 12 in.

(4) See Standard Drawing series E 609-BRJT for joint type I-A details.

5. See Standard Drawing series E 703-BRST for reinforcing-bar bending details and notes.

(6) When shown on the plans, see Standard Drawing series E 503-BATJ for terminal joint and sleeper slab details.

(7) When the RCBA is constructed without a terminal joint, subgrade treatment shall be omitted and geotextile shall be placed under subbase for PCCP.



591 x 20'-9"

KEY:

RCBA = Reinforced Concrete Bridge Approach

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS

SEPTEMBER 2020

STANDARD DRAWING NO. E 609-RCBA-04

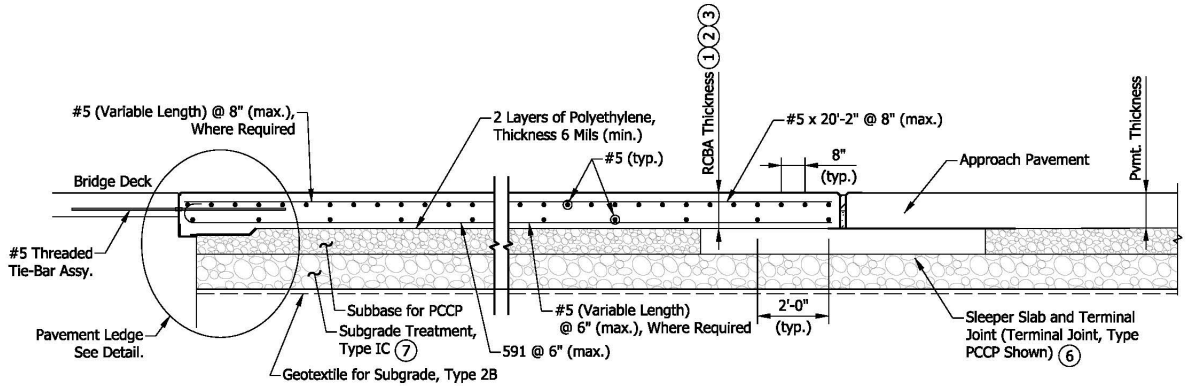
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

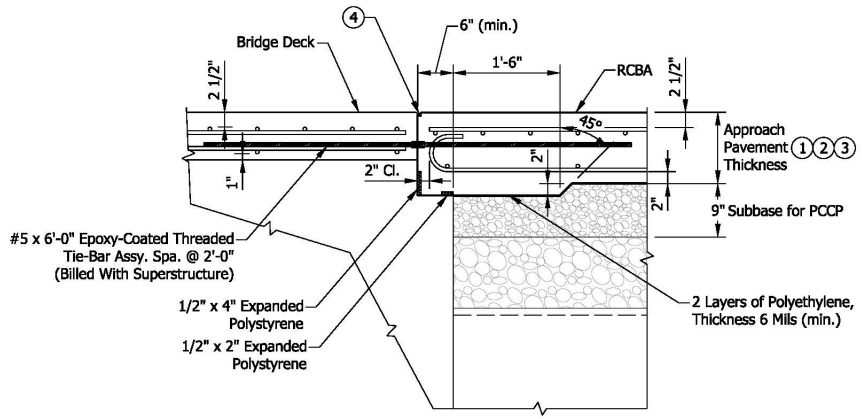
04/02/20
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-RCBA-04 REINFORCED CONCRETE BRIDGE APPROACH SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS (proposed draft)



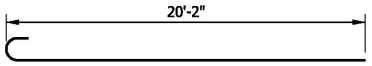
SECTION THROUGH APPROACH



PAVEMENT LEDGE DETAIL

NOTES:

1. See plans for approach pavement thickness.
2. For HMA approach pavement:
   RCBA = 10 in. if design year AADT < 1000
   RCBA = 12 in. if design year AADT ≥ 1000
3. For PCCP approach pavement:
   RCBA = 12 in. if pavement thickness < 12 in.
   RCBA = Same as pavement thickness, if pavement thickness ≥ 12 in.
4. See Standard Drawing series E 609-BRJT for joint type I-A details.
5. See Standard Drawing series E 703-BRST for reinforcing-bar bending details and notes.
6. When shown on the plans, see Standard Drawing series E 503-BATJ for terminal joint and sleeper slab details.
7. When the RCBA is constructed without a terminal joint, subgrade treatment shall be omitted and geotextile shall be placed under subbase for PCCP.



591 x 20'-9"

KEY:

RCBA = Reinforced Concrete Bridge Approach

INDIANA DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE BRIDGE APPROACH SECTION, PAVEMENT LEDGE, AND BAR BENDING DETAILS

SEPTEMBER 2020

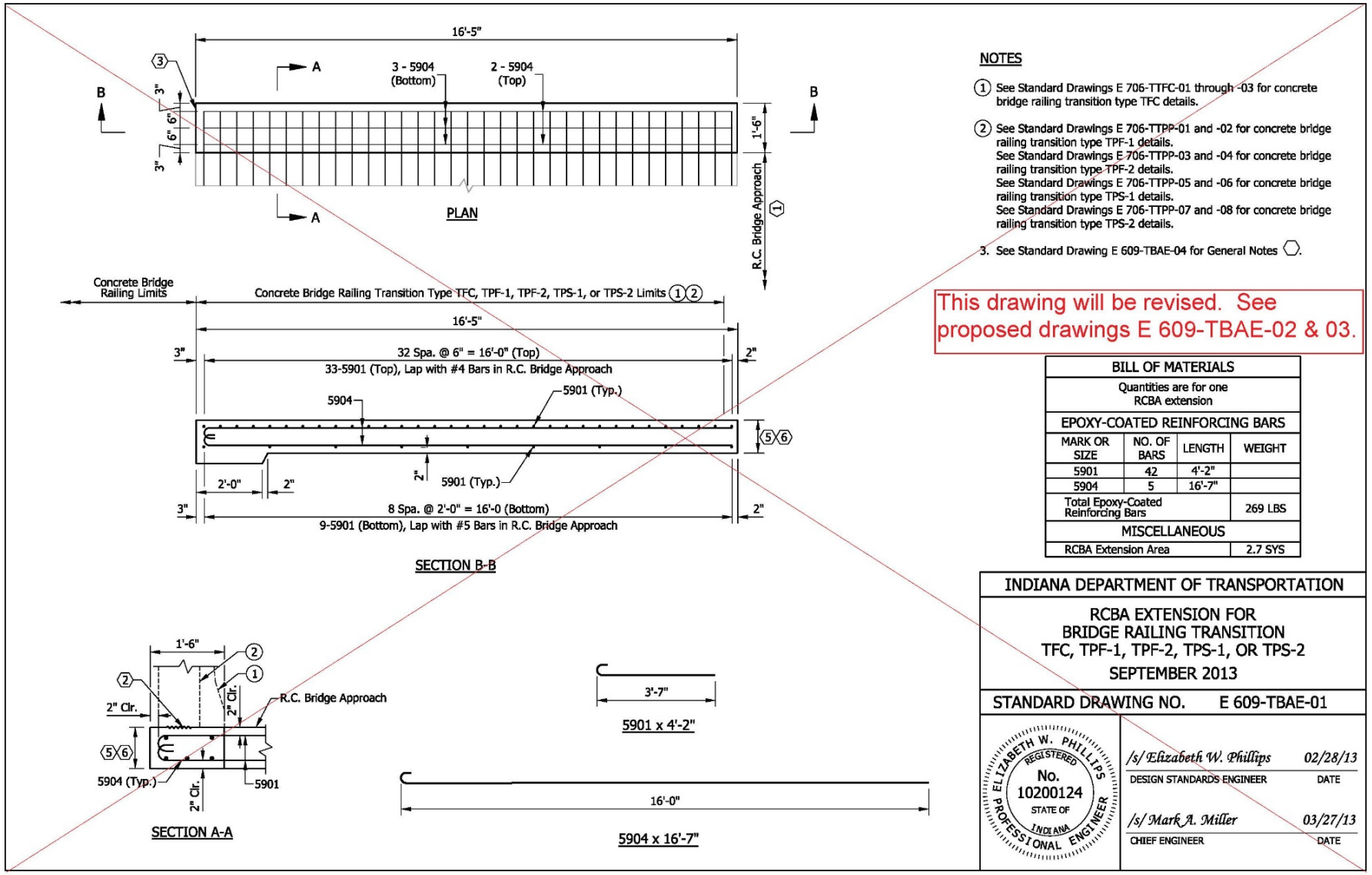
STANDARD DRAWING NO. E 609-RCBA-04

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-TBAE-01 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION TFC, TPF-1, TPF-2, TPS-1, OR TPS-2 (existing, shown markups)



NOTES

1. See Standard Drawings E 706-TTFC-01 through -03 for concrete bridge railing transition type TFC details.
2. See Standard Drawings E 706-TTPP-01 and -02 for concrete bridge railing transition type TPF-1 details.
   See Standard Drawings E 706-TTPP-03 and -04 for concrete bridge railing transition type TPF-2 details.
   See Standard Drawings E 706-TTPP-05 and -06 for concrete bridge railing transition type TPS-1 details.
   See Standard Drawings E 706-TTPP-07 and -08 for concrete bridge railing transition type TPS-2 details.
3. See Standard Drawing E 609-TBAE-04 for General Notes ⬡.

This drawing will be revised. See proposed drawings E 609-TBAE-02 & 03.

BILL OF MATERIALS			
Quantities are for one RCBA extension			
EPOXY-COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	42	4'-2"	
5904	5	16'-7"	
Total Epoxy-Coated Reinforcing Bars			269 LBS
MISCELLANEOUS			
RCBA Extension Area			2.7 SYS

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR
BRIDGE RAILING TRANSITION
TFC, TPF-1, TPF-2, TPS-1, OR TPS-2
SEPTEMBER 2013

STANDARD DRAWING NO. E 609-TBAE-01

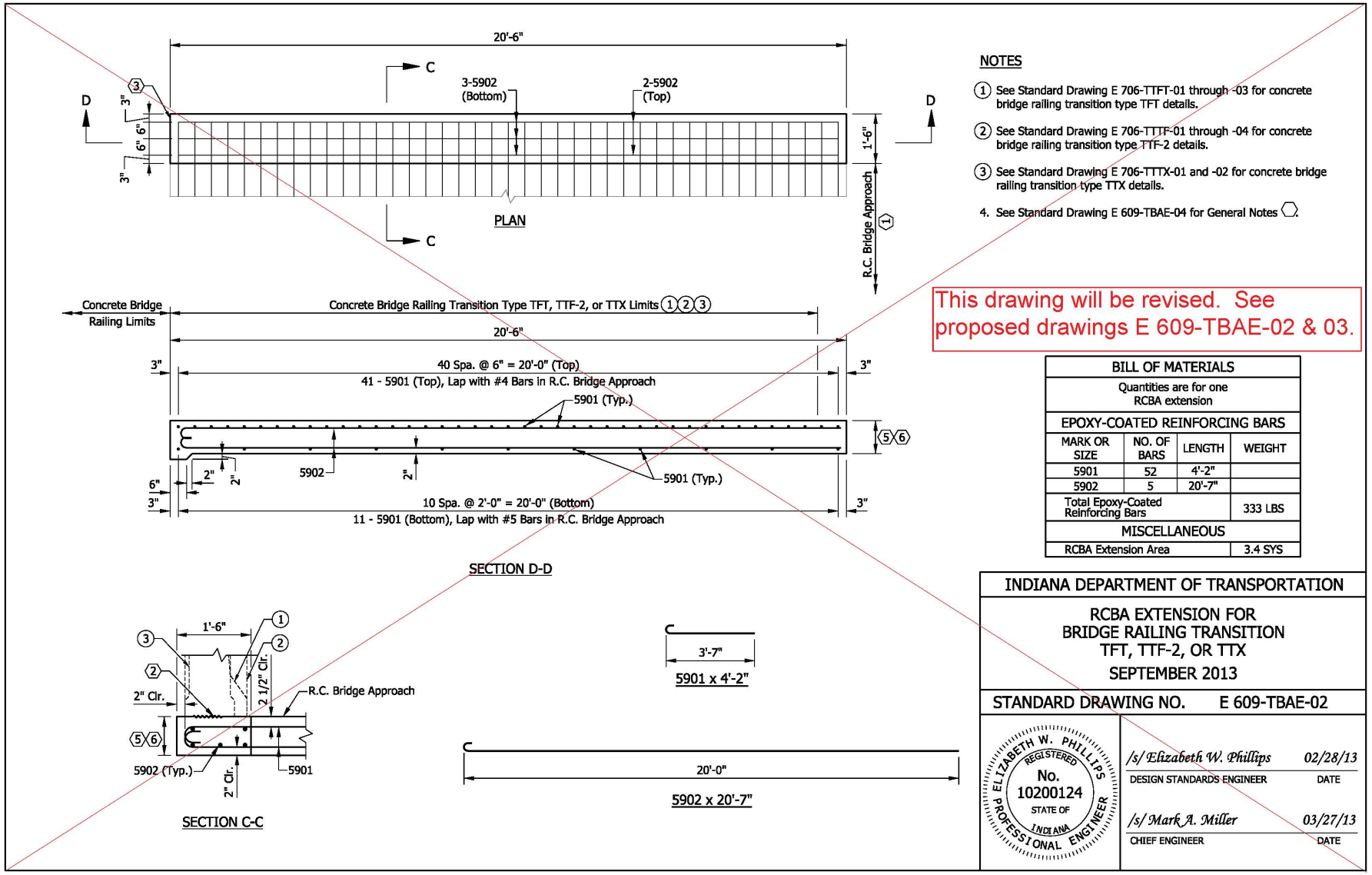
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

/s/ Elizabeth W. Phillips 02/28/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-TBAE-02 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION TFT, TTF-2, OR TTX (existing, shown markups)



NOTES

1. See Standard Drawing E 706-TTFT-01 through -03 for concrete bridge railing transition type TFT details.
2. See Standard Drawing E 706-TTTF-01 through -04 for concrete bridge railing transition type TTF-2 details.
3. See Standard Drawing E 706-TTTX-01 and -02 for concrete bridge railing transition type TTX details.
4. See Standard Drawing E 609-TBAE-04 for General Notes ⬡.

This drawing will be revised. See proposed drawings E 609-TBAE-02 & 03.

BILL OF MATERIALS			
Quantities are for one RCBA extension			
EPOXY-COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	52	4'-2"	
5902	5	20'-7"	
Total Epoxy-Coated Reinforcing Bars			333 LBS
MISCELLANEOUS			
RCBA Extension Area			3.4 SYS

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR BRIDGE RAILING TRANSITION TFT, TTF-2, OR TTX

SEPTEMBER 2013

STANDARD DRAWING NO. E 609-TBAE-02

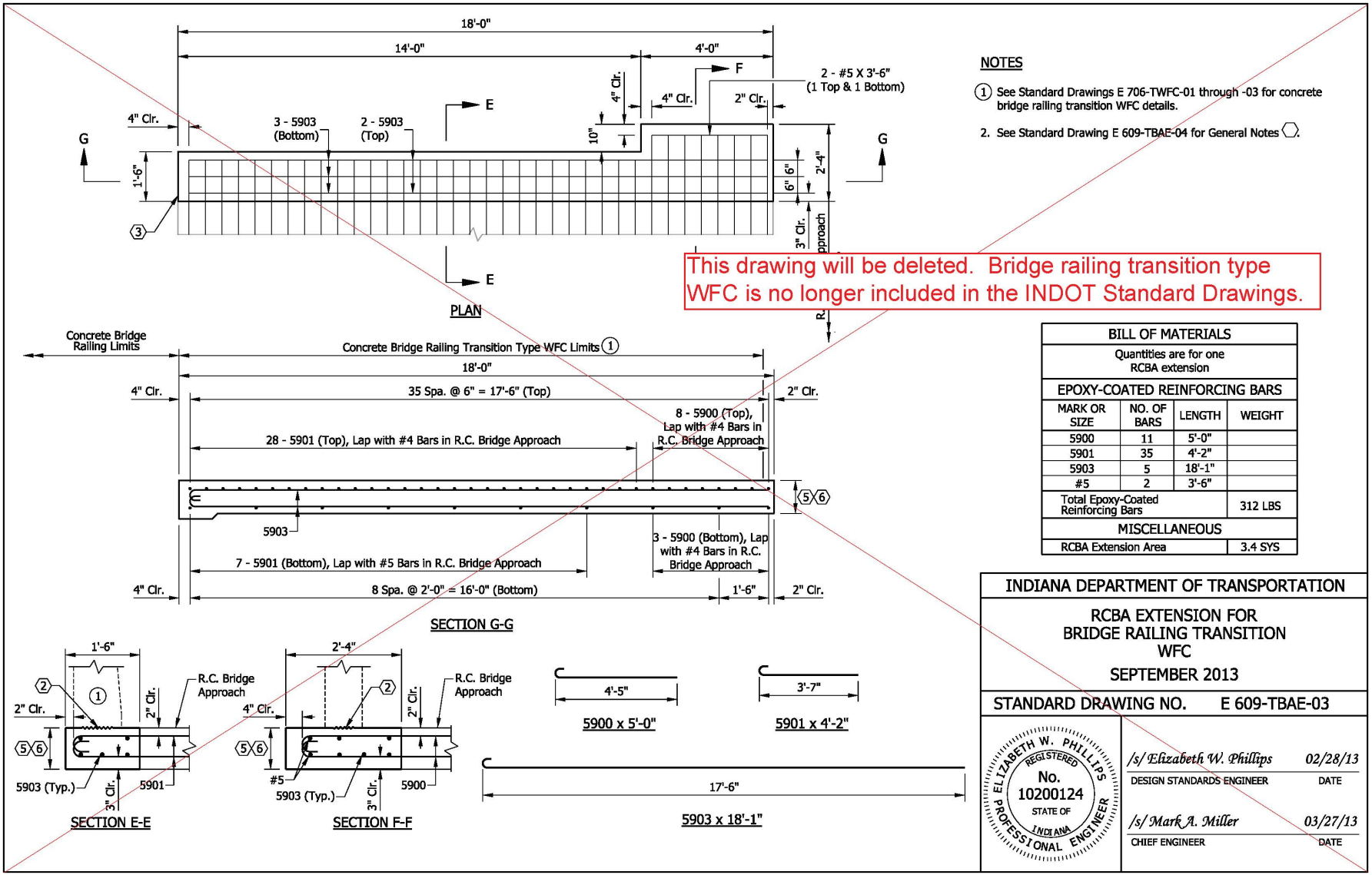
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

/s/ Elizabeth W. Phillips 02/28/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-TBAE-03 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION WFC (existing, shown markups)



NOTES

(1) See Standard Drawings E 706-TWFC-01 through -03 for concrete bridge railing transition WFC details.

2. See Standard Drawing E 609-TBAE-04 for General Notes ⬡.

BILL OF MATERIALS			
Quantities are for one RCBA extension			
EPOXY-COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5900	11	5'-0"	
5901	35	4'-2"	
5903	5	18'-1"	
#5	2	3'-6"	
Total Epoxy-Coated Reinforcing Bars			312 LBS
MISCELLANEOUS			
RCBA Extension Area			3.4 SYS

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR BRIDGE RAILING TRANSITION WFC

SEPTEMBER 2013

STANDARD DRAWING NO. E 609-TBAE-03

ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

/s/ Elizabeth W. Phillips 02/28/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-TBAE-04 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION GENERAL NOTES (existing, shown markups)

GENERAL NOTES

1. See Standard Drawing series E 609-RCBA and the plans for reinforced concrete bridge approach details.
2. Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.
3. This end of the reinforced concrete bridge approach extension shall match the construction at the bridge end as shown on the plans.
4. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.
5. See the plans for thickness of RCBA and its extension to be used with asphalt pavement.
6. See the plans for thickness of RCBA and its extension to be used with a terminal joint and portland cement concrete pavement.

This drawing will be revised. See proposed drawing E 609-TBAE-01.

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR
BRIDGE RAILING TRANSITION
GENERAL NOTES
SEPTEMBER 2012

STANDARD DRAWING NO. E 609-TBAE-04

RICHARD L. VanCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

/s/ Richard L. Van Cleave 09/04/12
SUPERVISOR, ROADWAY STANDARDS DATE

/s/ Mark A. Miller 09/04/12
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-TBAE-01 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION INDEX AND GENERAL NOTES (proposed draft)

INDEX	
SHEET NO.	SUBJECT
1	RCBA Extension for Bridge Railing Transition Index and General Notes
2	RCBA Extension for Bridge Railing Transition Plan, Section B-B Details, and RCBA Extension Dimensions
3	RCBA Extension for Bridge Railing Transition Bill of Materials, Bar Bending and Section A-A Details

GENERAL NOTES:

1. All reinforcing bars shall be epoxy coated.
2. See Standard Drawing series E 609-RCBA for reinforced concrete bridge approach slab details.

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR
BRIDGE RAILING TRANSITION
INDEX AND GENERAL NOTES
SEPTEMBER 2021

STANDARD DRAWING NO. E 609-TBAE-01

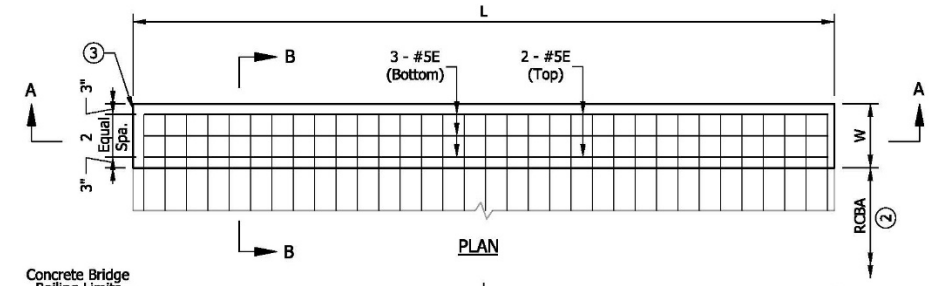
DESIGN STANDARDS ENGINEER DATE

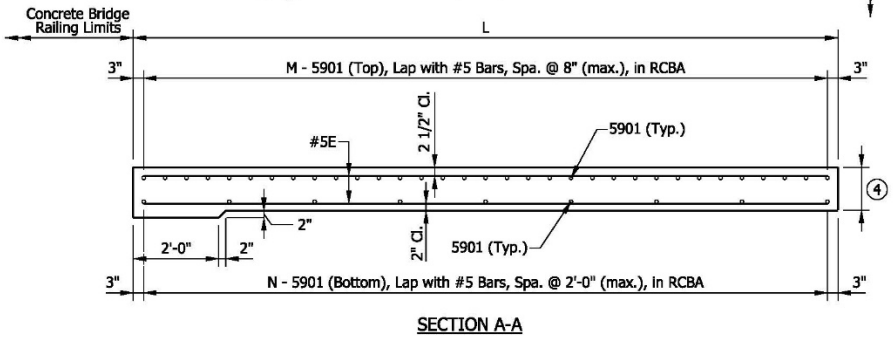
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-TBAE-02 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION PLAN, SECTION B-B DETAILS AND RCBA EXTENSION DIMENSIONS (proposed draft)

RCBA EXTENSION DIMENSIONS				
Transition	Length, L	Width, W	No. Top Bars, M	No. Bottom Bars, N
TFC	15'-10"	1'-6"	24	9
TFT	20'-2"	1'-6"	31	11
TPF-1	15'-10"	1'-0"	24	9
TPS-1	15'-10"	1'-0"	24	9
TTF-2	20'-2"	1'-6"	31	11
TTX	20'-6"	1'-2"	31	11





SECTION A-A

NOTES:

1. Typical concrete bridge railing transition reinforcing not shown for clarity.
2. See Standard Drawing series E 609-RCBA and the plans for reinforced concrete bridge approach details.
3. The end of the reinforced concrete bridge approach extension shall match the construction at the bridge end as shown on the plans.
4. See the plans for thickness of RCBA and its extension.

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR BRIDGE RAILING TRANSITION PLAN, SECTION B-B DETAILS, AND RCBA EXTENSION DIMENSIONS

SEPTEMBER 2021

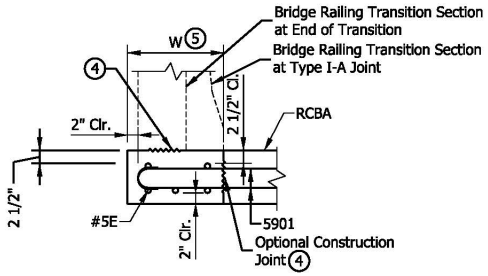
STANDARD DRAWING NO. E 609-TBAE-02

DESIGN STANDARDS ENGINEER DATE

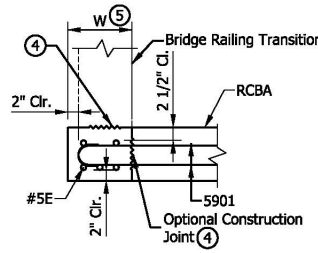
CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 609-TBAE-03 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION BILL OF MATERIALS, BAR BENDING AND SECTION A-A DETAILS (proposed draft)



SECTION B-B
(Bridge Railing Transitions Type (2))



SECTION B-B
(Bridge Railing Transitions Type (3))

NOTES:

1. See Standard Drawing series E 703-BRST for reinforcing bar bending details and notes.

(2) •See Standard Drawing series E 706-TTFC for concrete bridge railing transition type TFC details.
•See Standard Drawing series E 706-TTFT for concrete bridge railing transition type TFT details.

(3) •See Standard Drawing series E 706-TTPP for concrete bridge railing transition type TPF-1 and type TPS-1 details.
•See Standard Drawing series E 706-TTTF for concrete bridge railing transition type TTF-2 details.
•See Standard Drawing series E 706-TTTX for concrete bridge railing transition type TTX details.

(4) Construction joint type A. See Standard Drawing series E 702-CJTA for details.

(5) See RCBA Extension Dimensions Table for width.

5901 x 4'-4"

BILL OF MATERIALS FOR TYPE TPS-1			
Quantities are for one RCBA extension			
EPOXY COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	33	4'-4"	149
#5	5	15'-6"	81
Total Epoxy Coated Reinforcing Bars			230 LBS
MISCELLANEOUS			
RCBA Extension Area			1.8 SYS

BILL OF MATERIALS FOR TYPE TFC			
Quantities are for one RCBA extension			
EPOXY COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	33	4'-4"	149
#5	5	15'-6"	81
Total Epoxy Coated Reinforcing Bars			230 LBS
MISCELLANEOUS			
RCBA Extension Area			2.6 SYS

BILL OF MATERIALS FOR TYPE TPF-1			
Quantities are for one RCBA extension			
EPOXY COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	33	4'-4"	149
#5	5	15'-6"	81
Total Epoxy Coated Reinforcing Bars			230 LBS
MISCELLANEOUS			
RCBA Extension Area			1.8 SYS

BILL OF MATERIALS FOR TYPE TTF-2			
Quantities are for one RCBA extension			
EPOXY COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	42	4'-4"	190
#5	5	19'-10"	103
Total Epoxy Coated Reinforcing Bars			293 LBS
MISCELLANEOUS			
RCBA Extension Area			3.4 SYS

BILL OF MATERIALS FOR TYPE TFT			
Quantities are for one RCBA extension			
EPOXY COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	42	4'-4"	190
#5	5	19'-10"	103
Total Epoxy Coated Reinforcing Bars			293 LBS
MISCELLANEOUS			
RCBA Extension Area			3.4 SYS

BILL OF MATERIALS FOR TYPE TTX			
Quantities are for one RCBA extension			
EPOXY COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
5901	42	4'-4"	190
#5	5	20'-2"	105
Total Epoxy Coated Reinforcing Bars			295 LBS
MISCELLANEOUS			
RCBA Extension Area			2.7 SYS

INDIANA DEPARTMENT OF TRANSPORTATION

RCBA EXTENSION FOR BRIDGE RAILING TRANSITION BILL OF MATERIALS, BAR BENDING AND SECTION A-A DETAILS

SEPTEMBER 2021

STANDARD DRAWING NO. E 609-TBAE-03

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

COMMENTS AND ACTION

E 609-RCBA-01 thru 04 REINFORCED CONCRETE BRIDGE APPROACH (changes to E 609-RCBA-04 only)
E 609-TBAE-01 thru 03 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION

DISCUSSION:

This item was introduced and presented by Mr. Orton, assisted by Mr. White who explained that the reinforced concrete bridge approach extension for bridge railing transition drawing series, TBAE, hasn't been updated to reflect changes to the RCBA Standard Drawings that were implemented in 2014. As a result, the reinforcing in the TBAE series isn't consistent with the reinforcing in the RCBA series, which causes constructability concerns. The current TBAE series also lists several bridge railing types that are no longer INDOT standard bridge railing types. Also, the clearance from the top of the RCBA to the top layer of reinforcing bars was decreased from 2 1/2" to 2" when the RCBA Standard Drawings were revised in 2014. This has reduced the amount of protection for the reinforcing bars and has also increased the risk of snagging reinforcing bars during future milling and overlay operations.

Mr. Orton therefore proposed the drawing revisions as shown above, and as described in the Proposal Sheet.

Following very brief discussions for clarification, this item passed as submitted.

Motion: Mr. Orton Second: Mr. Boruff Ayes: 10 Nays: 0 FHWA Approval: Yes	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 609 (no changes required).	___ 2022 Standard Specifications ___ Revise Pay Items List
Recurring Special Provision references in: NONE	___ Create RSP (No.___) Effective: RSP Sunset Date:
Standard Drawing affected: TBAE series (complete revision), RCBA series (changes to sheet 04 only).	___ Revise RSP (No.___) Effective: RSP Sunset Date:
Design Manual Sections affected: 17-5.09(01 & 02) [no change needed].	X Standard Drawing Effective: September 1, 2021
GIFE Sections cross-references: NONE	___ Create RPD (No. ___) Effective: ___ GIFE Update ___ SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The approved materials list for temporary pavement marking tape has some products that are only retro-reflective when the pavement is dry and some products that are retro-reflective during both dry and wet conditions. Pavement markings that provide retro-reflectivity during both wet and dry weather have been found to reduce crashes by approximately 10%.

PROPOSED SOLUTION: Update the requirements for temporary pavement marking tape in §923.01 to specify both wet and dry retro-reflectivity for white and yellow markings. The minimum values for the wet and dry retro-reflectivity for removable temporary tape would be controlled by the approved materials list and the test method procedure for this list. Currently two manufacturers on this approved materials list have products that have retro-reflectivity during wet and dry conditions, and this is noted by the WR code in the product name. A third manufacturer has submitted a wet and dry retro-reflective product for evaluation and approval is expected.

APPLICABLE STANDARD SPECIFICATIONS: 923.01

APPLICABLE STANDARD DRAWINGS: No

APPLICABLE DESIGN MANUAL SECTION: No

APPLICABLE SECTION OF GIFE: No

APPLICABLE RECURRING SPECIAL PROVISIONS: No

PAY ITEMS AFFECTED: No

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Reviewed by Traffic Standards Subcommittee and Indiana LTAP.

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: Required for all contracts with any 801 pay items.

IMPACT ANALYSIS (attach report): Yes

Submitted By: Joe Bruno on behalf of Dave Boruff
Title: Sr. Engineer of Signals & Markings
Organization: INDOT
Phone Number: (317) 234-7949

Date: 10/26/2020

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? Yes
Will this proposal improve:

Construction costs? No

Construction time? No

Customer satisfaction? Yes

Congestion/travel time? Yes

Ride quality? Yes

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? N/A

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? N/A

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 STANDARD SPECIFICATIONS

SECTION 923 - TEMPORARY TRAFFIC CONTROL DEVICES
923.01 Temporary Pavement Marking Tape

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 923, BEGIN LINE 3, DELETE AND INSERT AS FOLLOWS:

923.01 Temporary Pavement Marking Tape

Temporary pavement marking tape shall be furnished in three colors and two types. It shall consist of a white or yellow ~~reflecting~~ film *that provides both dry and wet retro-reflectivity* on a conformable backing which is a minimum of 4 in. wide and is designed for marking either asphalt or concrete pavements. Black temporary pavement marking tape shall consist of a matte film on a conformable backing, which is designed for marking asphalt pavement. White and yellow temporary pavement marking tape shall be in accordance with ASTM D4592.

COMMENTS AND ACTION

923.01 Temporary Pavement Marking Tape

DISCUSSION:

This item was introduced and presented by Mr. Boruff who stated that the approved materials list for temporary pavement marking tape has some products that are only retro-reflective when the pavement is dry and some products that are retro-reflective during both dry and wet conditions. Pavement markings that provide retro-reflectivity during both wet and dry weather have been found to reduce crashes by approximately 10%.

Mr. Boruff therefore proposed to update the requirements for temporary pavement marking tape in 923.01 to specify both wet and dry retro-reflectivity for white and yellow markings. The minimum values for the wet and dry retro-reflectivity for removable temporary tape would be controlled by the approved materials list and the test method procedure for this list. Currently, two manufacturers on this approved materials list have products that have retro-reflectivity during wet and dry conditions, and this is noted by the WR code in the product name. A third manufacturer has submitted a wet and dry retro-reflective product for evaluation and approval is expected.

Mr. Boruff stated that an RSP is not necessary, and this revision can wait for the 2022 spec book. This item passed as submitted.

Motion: Mr. Boruff Second: Mr. Koch Ayes: 10 Nays: 0 FHWA Approval: Yes, per Mr. Drumm	Action:	
	_X_	Passed as Submitted
	___	Passed as Revised
	___	Withdrawn
Standard Specifications Sections referenced and/or affected: 923.01 pg 1132.	_X_	2022 Standard Specifications
	___	Revise Pay Items List
Recurring Special Provision references in: NONE	___	Create RSP (No.__) Effective: RSP Sunset Date:
Standard Drawing affected: NONE	___	Revise RSP (No.__) Effective: RSP Sunset Date:
Design Manual Sections affected: NONE	___	Standard Drawing Effective:
GIFE Sections cross-references: NONE	___	Create RPD (No. __) Effective:
	___	GIFE Update
	___	SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Longitudinal joint construction: Section 503.03(d) allows the longitudinal construction joint to be replaced by a longitudinal joint or be eliminated by extending the dowel bars when the shoulder is less than six feet wide. This allows the contractor to build the pavement and shoulder together. Industry (IACPA) has previously expressed confusion about the intent of the specification and whether or not the longitudinal joint is tied if the construction joint is eliminated. INDOT clarified that the intent is that the longitudinal joint or construction joint should always be tied. However, there is concern that, as written, if the shoulder is six feet wide the final configuration will create panels that are too wide (i.e. 15' x 18'). Also, in order to allow for future scenarios where the shoulders will be used to maintain traffic INDOT needs to decide whether or not dowels across the shoulder should be required instead of being a construction option. Industry recommended that the specification be changed to be for shoulders that are four feet or less in width.

PROPOSED SOLUTION: In order to match the design manual, section 602 requirements with drawing c602-3Z, change standard specification section 503 (d) as proposed.

APPLICABLE STANDARD SPECIFICATIONS: 503.03(d)

APPLICABLE STANDARD DRAWINGS:

APPLICABLE DESIGN MANUAL SECTION: 602 3Z

APPLICABLE SECTION OF GIFE: 8.7.1, 8.7.3, 8.7.5

APPLICABLE RECURRING SPECIAL PROVISIONS: 503-R-692

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc: Gary Fox, Mike Nelson, Jim Reilman, ACPA-Indiana

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman for Gary Fox

Title: State Materials Engineer

Organization: INDOT

Phone Number: 317-522-9692

Date: 10/20/2020

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? Yes
- Construction time? Yes
- Customer satisfaction? Yes
- Congestion/travel time? Yes
- Ride quality? Yes

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

- For motorists? Yes
- For construction workers? Yes

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? Yes
- Design process? Yes

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? Yes

Is this proposal needed for compliance with:

- Federal or State regulations? No
- AASHTO or other design code? Yes

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 RECURRING SPECIAL PROVISION

503-R-692 JOINTS (proposed changes to 503.03(d) Longitudinal Construction Joint)

(Note: **Only** proposed changes shown highlighted gray)

503-R-692 JOINTS

(Revised 02-20-20)

The Standard Specifications are revised as follows:

SECTION 503, BEGIN LINE 9, 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)9*
Threaded Tie Bar Assembly.....*910.01(b)2*

SECTION 503, BEGIN LINE 44, DELETE AND INSERT AS FOLLOWS:

(a) Type D-1 Contraction Joint

Type D-1 contraction joints shall be created by sawing slots in the pavement unless alternative methods are approved. The sawed contraction joint spacing shall be as shown on the plans or as directed, but shall not exceed 18 ft.

~~Sawed contraction joints shall be cut in two operations.~~ The ~~initial~~ saw cut shall commence as soon as the concrete has hardened sufficiently to enable sawing without raveling, usually 2 to 12 h after placement. All joints shall be saw cut through the edges of the pavement to the required depth before uncontrolled shrinkage cracking takes place. The sawing operations shall be carried on during day and night, regardless of weather conditions. The sawing of a joint shall be omitted if a crack occurs at or near the joint location prior to the time of sawing. Sawing shall be discontinued if a crack develops ahead of the saw. Formed contraction joints may be used where conditions make sawing impractical.

~~The second saw cut shall be made after the concrete has sufficiently cured, but before opening the pavement to non-construction traffic~~*The width of the saw cut will be measured for specification compliance at the time of the sawing operations.* Slurry or saw residue remaining in the slot shall be immediately flushed with water. Construction traffic shall not be allowed on the PCCP after the ~~second~~ saw cut until the joint is sealed.

The sawed slot shall be cleaned to remove all foreign matter from the entire depth of cut. Joint sealing shall be in accordance with 503.05.

(b) Longitudinal Joint

Longitudinal joints shall be created by sawing slots in the pavement unless alternative methods are approved. The longitudinal joint spacing shall be as shown on the plans or as directed, but shall not exceed ~~16~~*14* ft. Tie bars shall be placed by mechanical equipment in accordance with 508.04(a), or rigidly secured in place.

Longitudinal joints shall be cut to the depth, width, and line shown on the plans. The longitudinal joint slots shall be sawed concurrently with the ~~initial~~ D-1 contraction joint slots. If random cracking occurs ahead of sawing, the sawing operations shall be discontinued in that area. ~~A second saw cut shall be made when construction traffic uses the PCCP prior to sealing~~*The sawed joint shall be cleaned in accordance with 503.03(a).* Joint sealing shall be in accordance with 503.05.

Longitudinal joints may be replaced with longitudinal construction joints when approved by the Engineer.

SECTION 503, BEGIN LINE 94, DELETE AND INSERT AS FOLLOWS:

(d) Longitudinal Construction Joint

The longitudinal construction joint spacing shall be as shown on the plans or as approved. Tie bars shall be placed by mechanical equipment in accordance with 508.04(a) or other approved methods. Longitudinal construction joint saw cuts may be made as soon as the PCCP has sufficiently hardened.

Longitudinal construction joints shall be cut to the depth, width, and line shown on the plans. Construction traffic shall not be allowed on the PCCP after the saw cuts are made until the joints are sealed. Joint sealing shall be in accordance with 503.05.

Bent tie bar spacing shall be adjusted to prevent interference with the D-1 contraction joints. Bent tie bars shall not be omitted. Bent tie bars shall be replaced with retrofitted tie bars when more than one tie bar breaks within 30 ft during straightening.

The longitudinal construction joint for shoulder widths *4 ft or* less ~~than 6 ft~~ may be replaced by a longitudinal joint ~~or be~~*with tie bars. If the construction joint is* eliminated ~~by extending the type D-1 contraction joint through the shoulder. If either option is used~~, the mainline and shoulder shall be constructed at the same time.

(e) Terminal Joints

~~Terminal joints shall consist of a sleeper slab, polyethylene bond breaker, and HMA mixtures. The polyethylene bond breaker shall be an approved polyethylene sheeting having a thickness of 6 mils or greater. HMA mixtures shall consist of type B surface and intermediate mixtures in accordance with 402.04. A MAF in accordance with 402.05 will~~

~~not apply. Aggregate requirements of 904.03(d) do not apply. The portion of the sleeper slab on which the polyethylene bond breaker is to be placed shall be finished to a smooth trowel finish.~~*A terminal joint of the type specified shall be constructed at the locations as shown on the plans. The embankment shall be shaped to the required grade and section, free from all ruts, corrugations, or other irregularities, and uniformly compacted and approved in accordance with 203. The embankment shall be furnished within a tolerance of 1/2 in. from the grade as shown on the plans. The subgrade shall be prepared as shown on the plans and in accordance with 207. The sleeper slab shall be placed on top of the prepared subgrade.*

1. Terminal Joint, Type PCCP

Terminal joint, type PCCP, shall consist of a sleeper slab, polyethylene bond breaker, pre-compressed foam joint, and jointed reinforced concrete pavement, JRCP, transition slabs. The polyethylene bond breaker shall be an approved polyethylene sheeting having a thickness of 6 mils or greater. The portion of the sleeper slab on which the polyethylene bond breaker is to be placed shall be finished to a smooth trowel finish. The pre-compressed foam joint shall be in accordance with 724 and as shown on the plans. The concrete and placement for JRCP transition slabs shall be in accordance with 502 and as shown on the plans. Steel reinforcement shall be epoxy coated and placed in accordance with 703. The metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place shall be epoxy coated.

2. Terminal Joint, Type HMA

Terminal joint, type HMA, shall consist of a sleeper slab, concrete lug, polyethylene bond breaker, and pre-compressed foam joint. The polyethylene bond breaker shall be an approved polyethylene sheeting having a thickness of 6 mils or greater. The portion of the sleeper slab on which the polyethylene bond breaker is to be placed shall be finished to a smooth trowel finish. A type A construction joint shall be constructed as shown on the plans. The pre-compressed foam joint shall be in accordance with 724 and as shown on the plans.

The saw cut shall be sealed with hot pour joint sealant in accordance with 906.02(a)2.

SECTION 503, AFTER LINE 151, INSERT AS FOLLOWS:

(h) Expansion Joint with Load Transfer

Expansion joints with load transfer shall be constructed at the locations shown on the plans. The joint shall be an assembly of dowel bars, expansion caps, and joint filler components as shown on the plans. The components shall be supported by an approved welded wire assembly which holds the components rigid and in proper alignment during placement of the concrete.

Damaged or repaired joint filler shall not be used. The joint filler shall be held in a position which is normal to the surface and secured in place. The bottom of the joint filler shall be set firmly in place. The top of the joint filler shall be parallel to the pavement

surface and be the full width of the pavement. The expansion joint assembly shall be held in place in accordance with 503.04(g). Finished joints shall deviate no more than 1/4 in. in the horizontal alignment from a straight line. There shall be no offsets between adjacent sections when the joint filler consists of more than one section. No plugs or leakage of concrete shall be allowed to occur through the joint filler or into the air gap of expansion caps.

The expansion joint opening shall be sealed with hot pour joint sealant in accordance with 906.02(a)2.

SECTION 503, BEGIN LINE 204, DELETE AND INSERT AS FOLLOWS:

503.05 Sealing Cracks and Joints

~~Cracks and~~*All* joints *and cracks* in the PCCP shall be cleaned and sealed *with hot poured joint sealant* in accordance with the sealant manufacturer's recommendations. Water blasting shall not be applied under pressure which may damage the concrete. All cracks and joints shall be sealed prior to discontinuing work for the winter.

~~When preformed elastomeric joint seals are used, the material shall be installed in one continuous piece by means of an approved machine. The seal shall not be stretched more than 5% while being placed and show no twisting, rollover, folding, cutting, or excess lubricant adhesive on the top of the seal. Elastomeric joint seal may be installed in two separate pieces for phased construction with the splice point occurring at the highest point of the joint. The splicing method used shall be in accordance with the seal manufacturer's recommendations.~~

SECTION 503, BEGIN LINE 239, DELETE AND INSERT AS FOLLOWS:

503.07 Method of Measurement

D-1 contraction joints, *expansion joint with load transfer*, and terminal joints will be measured by the linear foot as measured along the centerline of the joint. *The sleeper slab, reinforcing bars, bond breaker, sealants for the terminal joint will not be measured. When required, removal of an existing terminal joint or sleeper slab will not be measured.*

JRCP will be measured by the square yard of the thickness specified. Reinforcing bars, the metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place in the JRCP will not be measured.

Retrofitted tie bars will be measured by the number of units installed.

503.08 Basis of Payment

D-1 contraction joints, *expansion joint with load transfer* and terminal joints will be paid for at the contract unit price per linear foot, complete in place.

JRCP will be paid for at the contract unit price per square yard of the thickness specified, complete in place.

REVISION TO RECURRING SPECIAL PROVISION

503-R-692 JOINTS (proposed changes to 503.03(d) Longitudinal Construction Joint)

Retrofitted tie bars will be paid for at the contract unit price per each, complete in place.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
D-1 Contraction Joint	LFT
Expansion Joint with Load Transfer	*LFT*
Jointed Reinforced Concrete Pavement, _____ thickness in.	*SYS*
Retrofitted Tie Bars	EACH
Terminal Joint*, Type ____*	LFT

The cost of furnishing and placing all materials, not specified as a pay item, shall be included in the cost of PCCP.

The cost of reinforcing bars, metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place shall be included in the cost of the JRCP.

For D-1 contraction joints, ~~T~~*t*he cost of dowels, dowel bar assemblies, backer rod, joint sealants and all necessary incidentals shall be included in the cost of D-1 contraction joints.

For the construction of expansion joints, the cost of dowels, dowel bar assemblies, expansion caps, joint filler, joint sealants and all necessary incidentals shall be included in the cost of the expansion joint with load transfer.

The cost of the sleeper slab, reinforcing bars, bond breaker, ~~and HMA mixtures~~*, joint sealant and all necessary incidentals* shall be included in the cost of the terminal joint. *When required, removal of an existing terminal joint and sleeper slab shall be included in the cost of the terminal joint.*

The cost of retrofitted tie bars or PCCP replacement used to repair damaged PCCP due to fault or negligence, remediation of random cracking, or the replacement of broken deformed bars shall be included in the cost of the PCCP.

COMMENTS AND ACTION

503-R-692 JOINTS

DISCUSSION:

This item was introduced and presented by Mr. Reilman who explained that Standard Specification Section 503.03(d) allows the longitudinal construction joint to be replaced by a longitudinal joint or to be eliminated by extending the dowel bars when the shoulder is less than six feet wide. This allows the Contractor to build the pavement and shoulder together. Industry, IACPA, has previously expressed confusion about the intent of the specification and whether or not the longitudinal joint is tied if the construction joint is eliminated. The Department clarified that the intent is that the longitudinal joint or construction joint should always be tied. However, there is concern that, as written, if the shoulder is six feet wide, the final configuration will create panels that are too wide. Also, in order to allow for future scenarios where the shoulders will be used to maintain traffic, INDOT needs to decide whether or not dowels across the shoulder should be required instead of being a construction option. Industry recommended that the RSP be revised to be for shoulders that are four feet or less in width.

Mr. Reilman therefore proposed to revise 503 (d) as shown above, in order to match the design manual, section 602 requirements with drawing C602-3Z. Ms. Smutzer asked if drawing C602-3Z could be updated as well. Mr. Reilman concurred.

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

Motion: Mr. Reilman Second: Mr. Koch Ayes: 10 Nays: 0 FHWA Approval: Yes	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 503.03 pg 418. Recurring Special Provision references in: 503-R-692 JOINTS Standard Drawing affected: (see proposal). Design Manual Sections: 602. GIFE Sections cross-references: 8.7.1, 8.7.3, 8.7.5.	X 2022 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No.___) Effective: RSP Sunset Date: X Revise RSP (No. 503-R-692) Effective: June 1, 2021 RSP Sunset Date: 2022 SS book ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update ___ SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: INDOT has a longstanding QC/QA soil unique provision. By its definition, unique is something that is for one or two jobs. INDOT tried this concept on multiple contracts over the past 10 years and it seems to have worked well. Thus, it is time to move the unique provision into an RSP and maybe the Standard Specifications.

PROPOSED SOLUTION: Convert the QC/QA soils unique provision into an RSP and consider inclusion in the Standard Specifications.

APPLICABLE STANDARD SPECIFICATIONS: New section 218

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: yes; will need instructions to designers on when to use. Propose similar guidance as to when to use 501 QC/QA PCCP vs 502 PCCP.

APPLICABLE SECTION OF GIFE: yes

APPLICABLE RECURRING SPECIAL PROVISIONS: create new RSP

PAY ITEMS AFFECTED: Yes, create new pay items

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc: Victoria Leffel, Jim Reilman, Nayyar Siddiki, Kurt Sommer, Haiyan Yang, earthwork contractors referred by ICI

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman for Nayyar Siddiki

Title: State Materials Engineer

Organization: INDOT, Office of Materials & Tests

Phone Number: 317-522-9692

Date: 10/22/2020

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? NA
Will this proposal improve:

Construction costs? Yes

Construction time? NA

Customer satisfaction? Yes

Congestion/travel time? NA

Ride quality? yes

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? yes

For construction workers? NA

Will this proposal improve quality for:

Construction procedures/processes? yes

Asset preservation? Yes

Design process? NA

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? NA

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:

The Standard Specifications are revised as follows:

SECTION 218, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 218 – QC/QA SOIL EMBANKMENT AND QC/QA SUBGRADE

218.01 Description

This work shall consist of the construction of a soil embankment and subgrade in accordance with 105.03, 203, and 207.

218.02 Quality Control

QC testing shall include DCP in accordance with ITM 509, LWD in accordance with ITM 508, moisture in accordance ITM 506, and one point proctor in accordance with ITM 512.

(a) Quality Control Plan

The Contractor shall prepare and submit a QCP in accordance with ITM 803. The QCP shall be submitted to the Engineer and the Office of Materials Management at least 15 days prior to the Contractor's planned start date for embankment or subgrade. Embankment and subgrade operations shall not begin until the Contractor receives written notice from the Engineer that the QCP has been accepted.

(b) Quality Control Technician

The Contractor shall provide a QC Technician. The QC Technician shall be qualified in accordance with the Department's Office of Materials Management Directive 107 for ITM 506, ITM 508, ITM 509, and ITM 512, and AASHTO T255.

(c) Ineffective or Unqualified Equipment or Personnel

The Department may require the replacement of ineffective or unqualified equipment or QC personnel. If such action is required by the Department, construction operations shall stop until appropriate corrective actions have been taken.

MATERIALS

218.03 Materials

Materials shall be in accordance with the following:

Chemical Modification of Soils.....215
Embankment.....203
Subgrade.....207

CONSTRUCTION REQUIREMENTS

218.04 Mixing, Compacting, and Proofrolling

Chemically modified soils for subgrade, including grade preparation,

pulverization, spreading, mixing, and compaction shall be in accordance with 215. QC testing shall be performed in accordance with the QCP and ITM 803 section 14.6 and section 14.7 for embankment and chemically modified soils respectively.

Soil Management shall be in accordance with the QCP and ITM 803. Adjustments shall be made to compaction procedures when the soil type changes.

Proofrolling prior to placing the first lift of embankment shall be conducted in accordance with 203.26. Proofrolling of the completed subgrade shall be completed in accordance with 203.26. The Engineer may require additional proofrolling passes if rutting or pumping is evident.

The Contractor shall provide documentation in accordance with the QCP and ITM 803 within 24 h of the completion of soil operations for each respective day.

218.05 Test Sections

Test sections shall be constructed in accordance with the QCP.

Test sections shall be constructed with the available equipment of the Contractor for non-chemically modified soils in accordance with 203, ITM 513, and ITM 803 to determine compaction pattern and rolling passes necessary to meet the DCP requirements. The roller equipment selected for use and rolling pattern shall be based on best compaction practice for the soil types encountered on the contract. The soil in the test section shall meet the requirements of 203.

218.06 Acceptance of Soil Compaction

Acceptance of the compaction of the soil embankment and subgrade will be based on the results of measurements and tests performed by the Engineer.

The moisture content and compaction acceptance of the soil embankment will be determined in accordance with 203.23 and 203.24. The moisture content and compaction acceptance of chemically modified soils will be determined in accordance with 215 or Special Provision 207–R-687.

The Contractor shall notify the Engineer when a lift area is ready for acceptance testing. Testing will be performed at random locations in accordance with ITM 802 at the frequency described in the Frequency Manual.

218.07 Deficiencies

Individual embankment or subgrade locations that do not meet the requirements of 203.23 and 203.24, will be considered deficient. All locations exhibiting deflections or rutting in excess of the values shown in 203.26, as determined by the Department, will also be considered deficient.

When a deficiency is identified at the random location or by additional selective testing, the Contractor shall investigate and correct the deficiency by reworking the location in accordance with the QCP. The Engineer will subsequently randomly select at least two additional locations within the remaining lift area and perform acceptance testing. If either of the two additional locations fails to meet the acceptance criteria, then the entire lift area shall be evaluated by the Contractor in accordance with the QCP and reworked as necessary. All reworked areas shall be proofrolled in accordance with 203.26 before acceptance testing is resumed in that lift area.

Locations where rework is not required may still be reworked at the Contractor's option in accordance with the QCP. Reworked areas are subject to further review for excessive pumping or rutting at the discretion of the Department.

218.08 Method of Measurement

QC/QA soil embankment will be measured by the cubic yard in accordance with 203.27(e).

QC/QA subgrade will be measured in both cut and fill areas by the square yard per type. Chemicals for modification, excavation, aggregates, and geogrid materials will not be measured.

218.09 Basis of Payment

The accepted quantities of QC/QA embankment will be paid for at the contract unit price per cubic yard. The accepted quantities of QC/QA subgrade will be paid for at the contract unit price per square yard per type, complete in place.

Excavation and disposal of unsuitable material existing prior to beginning the QC/QA soil embankment work will be paid for at the contract unit price for QC/QA soil embankment.

Payment will be made under:

Pay Item	***Pay Unit Symbol***
QC/QA Soil Embankment	*CYS*
QC/QA Subgrade Treatment, Type _____	*SYS*

If QC/QA soil embankment is specified as a pay item, borrow and common excavation, unless otherwise specified, will not be paid for directly. The costs thereof shall be included in the cost of QC/QA soil embankment. Such price shall be full compensation for preparation of the natural ground on which the QC/QA soil embankment is to be placed and excavating, hauling, placing, spreading, and compaction of materials in accordance with 203.23.

SECTION 218 – QC/QA SOIL EMBANKMENT AND QC/QA SUBGRADE (Proposed new section)

The costs of labor, equipment, tools, and necessary incidentals shall be included in the cost of QC/QA soil embankment. The cubic yards of suitable material used in the embankment excavated from the construction limits and paid for under a specific pay item will not be deducted from the QC/QA soil embankment quantities.

The cost of QC/QA subgrade treatments including testing, sampling, aggregates, chemicals for modification, geogrid, geotextile and geocell confining system, coarse aggregate for QC/QA subgrade Type IC, Type II, Type IV, Type IVA, Type V, water, and the excavation required, shall be included in the cost of the pay item.

Where QC/QA soil embankment has not been constructed and conditions exist below the specified subgrade compaction depth that prevent achieving the specified compaction, payment for correcting such conditions will be made based on the directed method of treatment.

The cost of geotextiles shall be included in the cost of other items.

The costs for the use of coal ash in QC/QA soil embankment construction, including, but not limited to testing of the material, encasement, additional erosion and sediment control measures, lateral underdrains and all incidentals shall be included in the cost of the pay items in this section.

All costs related to any other equipment required for the QC/QA soil process, all quality control procedures including the QCP, on-site training, testing facility, construction of test sections, quality control testing, and inspection shall be included in the pay items of this section.

The cost of excavation and disposal of unsuitable material encountered during rework shall be included in the cost of the pay items of this section.

COMMENTS AND ACTION

SECTION 218 – QC/QA SOIL EMBANKMENT AND QC/QA SUBGRADE (Proposed new section)

DISCUSSION:

Mr. Reilman withdrew this item pending further review of comments received from industry, and others, prior to the meeting.

Mr. Duncan, FHWA, stated that the USP has been utilized on several I-69 projects, and it has performed well.
Mr. Novak stated that he's not sure if it would be good for small quantity jobs if required for all contracts.
Ms. Fletcher, FHWA, inquired about acceptance testing. Mr. Siddiki stated that had not yet been decided.

Motion: Second: Ayes: Nays: FHWA Approval:	Action: ___ Passed as Submitted ___ Passed as Revised _X_ Withdrawn
Standard Specifications Sections referenced and/or affected: SECTION 218 – QC/QA SOIL EMBANKMENT AND QC/QA SUBGRADE (Proposed new section). Recurring Special Provision references to: 207-R-687 (effective September 1, 2020). Standard Drawing affected: NONE Design Manual Sections affected: see proposal. GIFE Sections cross-references: NONE	___ 2022 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No.___) Effective: __ RSP Sunset Date: ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update ___ SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Pre-compressed foam joints are being used more frequently in bridge contracts. This joint type is also being used in all new terminal joints, as specified in RSP 503-R-692 and RPD 503-R-692d, which will be discontinued when incorporated into the 2022 Standard Specifications. RSP 724-B-309 is currently being used as the specification for this type of joint. This type of joint is being used frequently enough that it should be incorporated into the 2022 Standard Specifications. This will also allow section 503 to be revised to include the cost of the pre-compressed foam joint in the cost of the terminal joint, which will simplify the measurement and payment of terminal joints.

PROPOSED SOLUTION: Incorporate RSP 724-B-309 into the 2022 Standard Specifications. An Approved Products List will also be created for this joint material. Section 503 will be revised to include the pre-compressed foam joint in the cost of the terminal joint. The term Structural Expansion Joint is proposed to be changed to Bridge Expansion Joint for consistency with 906.07 and AASHTO Bridge Design Specifications.

APPLICABLE STANDARD SPECIFICATIONS: 111.12, 702.15(b), 724, 906.07

APPLICABLE STANDARD DRAWINGS: E 503-BATJ (no changes required)

APPLICABLE DESIGN MANUAL SECTION: 404-2.06(03) Expansion Joints

APPLICABLE SECTION OF GIFE: 5.20

APPLICABLE RECURRING SPECIAL PROVISIONS: RSP 503-R-692 (to be incorporated into 2022 Standard Specification), RSP 724-B-309 (proposed to be incorporated into 2022 Standard Specification)

PAY ITEMS AFFECTED: 724-03276 STRUCTURAL EXPANSION JOINT SEALING SYS, 724-09626 STRUCTURAL EXPANSION JOINT SEAL, SS, REPLACE, 724-09627 STRUCTURAL EXPANSION JOINT SEAL, M, REPLACE, 724-11062 STRUCTURAL EXPANSION JOINT, M, REPLACE, 724-11063 STRUCTURAL EXPANSION JOINT, SS, REPLACE, 724-12103 PRE-COMPRESSED FOAM JOINT, 724-51925 STRUCTURAL EXPANSION JOINT, SS, 724-51927 STRUCTURAL EXPANSION JOINT, M

APPLICABLE SUB-COMMITTEE ENDORSEMENT: INDOT/ASCE Structures Committee Involvement

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

[continued]

IMPACT ANALYSIS (attach report):

Submitted By: Pete White for Mark Orton

Title: Standards Engineer

Organization: INDOT Standards and Policy

Phone Number: 317-233-3840

Date: Oct. 27, 2020

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? 503 (currently RSP 503-R-692)
Will approval of this item affect the Approved Materials List? New list will be created
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? No

For construction workers? No

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? No

Design process? Yes

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? Yes

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: The terminal joint details that utilize pre-compressed foam joints will become part of the 2022 Standard Specifications.

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

SECTION 111 - STOCKPILED MATERIALS
111.12 Basis of Payment
SECTION 702 - STRUCTURAL CONCRETE
702.15 Joints
SECTION 724 - STRUCTURAL EXPANSION JOINTS
SECTION 906 - JOINT MATERIALS
906.07 Bridge Expansion Joints
Recuring Special Provision 503-R-692 JOINTS

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 111, BEGIN LINE 143, DELETE AND INSERT AS FOLLOWS:

111.12 Basis of Payment

Stockpiled materials which are authorized for payment in accordance with the requirements herein will be paid for in accordance with 111.03, 111.04, 111.05, 111.06, 111.07, 111.08, 111.09 and 111.10.

Payment will be made under:

Pay Item	Pay Unit Symbol
Stockpiled Material, _____ (type of material)	LFT
	CYS
	EACH
	LBS
	SFT
	SYS
	TON
Structural Steel	LS
Structural Members, Concrete	LS
~~Structural~~*Bridge* Expansion Joint, _____ (Type)	LFT

SECTION 702, BEGIN LINE 915, DELETE AND INSERT AS FOLLOWS:

(b) Expansion Joints

~~Structural~~*Bridge* expansion joints shall be of the form, dimensions, material, and design shown on the plans. Open expansion joints shall be completely open for the dimensions specified and for their entire length. Preformed expansion joint material shall be placed true and even and with abutting sections pressed together tightly. The material shall be of the size shown on the plans and shall be in accordance with 906.01.

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

SECTION 111 - STOCKPILED MATERIALS
111.12 Basis of Payment
SECTION 702 - STRUCTURAL CONCRETE
702.15 Joints
SECTION 724 - STRUCTURAL EXPANSION JOINTS
SECTION 906 - JOINT MATERIALS
906.07 Bridge Expansion Joints
Recuring Special Provision 503-R-692 JOINTS

SECTION 724, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 724 – ~~STRUCTURAL~~*BRIDGE* EXPANSION JOINTS

724.01 Description

(a) ~~Structural~~*Bridge* Expansion Joint

This work shall consist of furnishing and placing~~, for new construction,~~ ~~structural~~*bridge* expansion joints of the type specified, in accordance with 105.03.

(b) Replacement of Existing ~~Structural~~*Bridge* Expansion Joint

This work shall consist of the removal and replacement of an existing ~~structural~~*bridge* expansion joint with a joint of the type specified, in accordance with 105.03.

(c) Replacement of Existing ~~Structural~~*Bridge* Expansion Joint Seal

This work shall consist of the replacement of the joint seal in an existing ~~structural~~*bridge* expansion joint of the type specified*, in accordance with 105.03*.

MATERIALS

724.02 Materials

Materials shall be in accordance with the following:

Bridge Deck Patching Concrete *722*
Concrete, Class C 702
Expansion Joint M ..... 906.07(b)
Expansion Joint PCF ..... *906.07(c)*
Expansion Joint SS ..... 906.07(a)
Inorganic Zinc Primer ..... 909.02(a)1
Rapid Set Patching Materials *901.07*
Structural Steel 910.02

The joint manufacturer shall prepare and submit working drawings in accordance with 105.02. The working drawings shall include details of the assembly, *manufacturer's installation instructions,* installation details for where changes in the joint direction are required, manufacturer's specifications *for all joint materials and adhesives*, *a statement certifying the compatibility of the joint material and the substrate,* and joint setting data. *For joints constructed in phases, the joint width for the initial phase shall be established in accordance with the joint setting table. The joint width for each subsequent phase shall be equal to the field measurement of the joint constructed in the initial phase taken at the*

SECTION 111 - STOCKPILED MATERIALS
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Recuring Special Provision 503-R-692 JOINTS

time of the subsequent phase joint construction.

(a) Expansion Joint SS

The joint assembly shall consist of one of the allowable alternates for this type of joint as shown on the plans. The strip seal shall be sized to accommodate a minimum of 4 in. of movement. The strip seal shall be furnished in one continuous length for the entire limits of the installed joint. Field splicing of the strip seal will not be allowed.

(b) Expansion Joint M

The joint assembly shall be manufactured in accordance with the details shown on the working drawings as prepared by the manufacturer of the joint assembly. The strip seals shall be furnished in one continuous length for the entire limits of the installed joint. Field splicing of the strip seals will not be allowed.

(c) Expansion Joint PCF

The joint seal shall be sized to accommodate the anticipated thermal movement range shown on the plans. The nominal joint size shall meet or exceed the existing joint mean opening size at 60°F as shown on the plans.

CONSTRUCTION REQUIREMENTS

724.03 General Requirements

All welding shall be in accordance with 711.32. All splice welds shall develop full strength. All welds which come in contact with the seals shall be ground smooth. All metal surfaces in direct contact with the seal shall be cleaned and properly treated in accordance with the manufacturer's recommendations. Lubricants and adhesives shall be used in accordance with the joint manufacturer's recommendations. All excess lubricant and adhesive shall be removed before it has set.

Final adjustment of the assembly shall be made as directed at the time of installation. All movements due to such factors as shrinkage, creep, and mid-slab deflection shall be accounted for prior to this final adjustment.

(a) Replacement of Existing ~~Structural~~*Bridge* Expansion Joint

The existing joint and adjacent concrete shall be removed to the limits shown on the plans. Additional removal, as directed, may be required to encounter sound concrete adjacent to the joint area. The replacement joint shall be in accordance with the requirements contained herein for the specified type. Concrete shall be class C in accordance with 702.

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

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(b) Replacement of Existing ~~Structural~~*Bridge* Expansion Joint Seal

The existing seal shall be removed in its entirety. The new seal shall be installed in accordance with the requirements contained herein for the specified joint type.

(c) Installation of PCF Joint

Where an existing joint is to be replaced, the existing joint and adjacent concrete shall be removed to the limits shown on the plans. Additional concrete removal to ensure sound concrete adjacent to the joint area shall be as directed. Patching of adjacent concrete shall use bridge deck patching concrete or rapid setting patching materials.

The Contractor shall measure the existing opening perpendicular to the centerline of the joint to determine the installation opening. Using this information and movement and mean opening size from the plans, the manufacturer shall select a specific joint model for the size.

The joint area shall be cleaned as specified herein and in accordance with the manufacturer's guidance. Existing surfaces that will be in contact with the new joint shall be sandblasted and cleaned of all old joint seals, old materials or devices, bituminous material, dirt, grease, and all other deleterious material over the total area of the opening to receive the new joint in accordance with the manufacturer's recommendations. All areas to be in contact with the new joint shall be sound, clean, dry, and frost free. The use of heat will not be allowed to dry the adjacent surfaces. Bridge deck patching concrete shall be cured a minimum of ~~7~~ seven days and rapid setting patching materials shall be cured a minimum of ~~3~~ three days prior to installing the joint. Shorter cure durations will be allowed if approved in writing by the joint and sealant manufacturer~~s~~ and ~~indicated~~ shown on the working drawings.

The joint shall be adhered to the substrate with a field applied epoxy adhesive. Adhesives shall be used in accordance with the joint manufacturer's recommendations. All excess adhesive shall be removed before it has set. The epoxy material shall be stored, mixed, and placed in accordance with the manufacturer's recommendations.

Joints shall be inspected for proper depth, width, alignment and preparation as shown on the plans. The joint shall be installed when the temperature is within the allowable range stated in the manufacturer's instructions, but not less than 40°F. Final adjustment of the seal shall be made as directed at the time of installation. All movement due to such factors as shrinkage, creep and deflection shall be accounted for prior to this final adjustment.

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

SECTION 111 - STOCKPILED MATERIALS
111.12 Basis of Payment
SECTION 702 - STRUCTURAL CONCRETE
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Prior to the epoxy curing, the Contractor shall force the tip of the silicone sealant between the substrate and the joint, and inject a corner bead of silicone sealant along the entire length of the joint. The Contractor shall tool the silicone sealant to blend with the substrate and silicone coating of the joint.

724.04 Method of Measurement

~~Structural~~*Bridge* expansion joints will be measured by the linear foot along and parallel to the plane of the finished joint surface. Replacement of existing ~~structural~~*bridge* expansion joints will be measured by the linear foot along and parallel to the plane of the finished joint surface. Concrete removal and class C concrete required for the replacement of existing ~~structural~~*bridge* expansion joints *type SS and M* will not be measured for payment.

Patching of existing concrete adjacent to type PCF joints as shown on the plans, and as required by the Engineer, will be measured by the square foot of actual surface area of patching. Individual areas of less than 1 sq ft in area will be considered as 1 sq ft. Areas greater than 1 sq ft will be recorded as the actual measurement of the repaired area to the nearest 0.1 sq ft. Removal of the existing joint, removal of the concrete adjacent to the joint, epoxy adhesive, silicone sealant, and all other materials used in the installation of the type PCF joint will not be measured for payment.

Sliding cover plates will not be measured for payment. Replacement of existing ~~structural~~*bridge* expansion joint seals will be measured by the linear foot along and parallel to the plane of the finished seal installation.

724.05 Basis of Payment

~~Structural~~*Bridge* expansion joint will be paid for at the contract unit price per linear foot of the type specified, complete in place. Replacement of existing ~~structural~~*bridge* expansion joint will be paid for at the contract unit price per linear foot for ~~structural~~*bridge* expansion joint, of the type specified, replace, complete in place. Replacement of existing ~~structural~~*bridge* expansion joint seals will be paid for at the contract unit price per linear foot for ~~structural~~*bridge* expansion joint seal, of the joint type specified, replace. *The cost of concrete for patching bridge expansion joint areas adjacent to type PCF joints as shown on the plans and as directed by the Engineer will be paid for at the contract unit price per square foot.*

Payment will be made under:

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

SECTION 111 - STOCKPILED MATERIALS
111.12 Basis of Payment
SECTION 702 - STRUCTURAL CONCRETE
702.15 Joints
SECTION 724 - STRUCTURAL EXPANSION JOINTS
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Recuring Special Provision 503-R-692 JOINTS

Pay Item	**Pay Unit Symbol**
~~Structural~~*Bridge* Expansion Joint, ____ type	LFT
~~Structural~~*Bridge* Expansion Joint, ____ type, Replace	LFT
~~Structural~~*Bridge* Expansion Joint Seal, ____ type, Replace	LFT
Concrete for Patching Bridge Expansion Joint	*SFT*

The cost of sliding cover plates shall be included in the cost of ~~structural~~*bridge* expansion joint or ~~structural~~*bridge* expansion joint, replace, as applicable. The cost of reinforcing bars, concrete removal and class C concrete for the replacement of existing ~~structural~~*bridge* expansion joint shall be included in the cost of ~~structural~~*bridge* expansion joint, replace.

Areas where patching concrete for bridge expansion joints exceeds an average of 4 in. in depth will be paid for at a price calculated by means of multiplying the contract unit price for the respective item by the following factors:

(a) for portions thereof whose average depth is greater than 4 in. but less than 6 in. 1.25

(b) for portions thereof whose average depth is greater than or equal to 6 in. but less than 8 in. 1.50

(c) for all portions thereof whose average depth is 8 in. or greater, the work shall be done as extra work. Payment will be made in accordance with 104.03.

The cost of existing joint removal, epoxy adhesive, silicone sealant, and all other materials shall be included in the cost of the type PCF joint pay item.

The cost of removing the existing concrete, furnishing, hauling, and placing all materials, preparing the surface, and all necessary incidentals shall be included in the pay items in this section.

The cost of replacing damaged reinforcement, supplemental reinforcing bars and mechanical anchors shall be included in the pay items in this section.

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

SECTION 111 - STOCKPILED MATERIALS
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Recuring Special Provision 503-R-692 JOINTS

SECTION 906, BEGIN LINE 115, DELETE AND INSERT AS FOLLOWS:

906.07 Bridge Expansion Joints

Type S and Type M ~~J~~joints, including anchor assemblies, shall be shop fabricated, delivered and installed as a continuous unit for lengths up to 46 ft. Joints longer than 46 ft shall be furnished in continuous units or in appropriate shorter sections as shown on the working drawings and approved by the Engineer. Joints used in stage construction shall be furnished in sections appropriate to accommodate the work. All *steel* joints furnished in sections shall be spliced with welds, with ends prepared for welding in the shop. All welds shall be in accordance with 711.32.

Type PCF joints shall be fabricated, delivered, and installed in lengths no less than 6 ft. Sections of joint shall be field spliced using silicone sealant in accordance with the manufacturer's recommendations. Joints shall be furnished with the fewest number of splices possible, and sections less than 6 ft in length shall not be used unless required to complete the remaining length at the ends of a joint or construction phase.

SECTION 906, AFTER LINE 251, INSERT AS FOLLOWS:

(c) Type PCF

Pre-compressed foam joints, PCF, shall be furnished from the Department's list of approved PCF Bridge Joints. PCF joints may be added to the approved list by completing the requirements of ITM 806, Procedure C.

1. Requirements

a. These products shall consist of a highway grade silicone faced self-expanding foam expansion joint seal, a field-applied epoxy adhesive, and a field-applied silicone sealant. The foam seal shall be able to accommodate the thermal movement range shown on the plans and shall have a movement capability of no less than +50% to -50% of the nominal material size. The silicone facing material shall accommodate a minimum elongation of 1,200%.

The foam seal shall be accordance with the following requirements:

Property	*Test Method*	*Requirement*
Temperature Service Range	*ASTM C711*	*-40°F to 185°F*
UV Resistance	*ASTM G155 or ASTM C793*	*No Changes or cracking at 2,000 h*

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

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SECTION 906 - JOINT MATERIALS
906.07 Bridge Expansion Joints
Recuring Special Provision 503-R-692 JOINTS

(Note: **Only** affected sections of the Recurring Special Provision *503-R-692 JOINTS* shown with proposed changes highlighted gray)

SECTION 503, BEGIN LINE 239, DELETE AND INSERT AS FOLLOWS:

503.07 Method of Measurement

D-1 contraction joints, *expansion joint with load transfer*, and terminal joints will be measured by the linear foot as measured along the centerline of the joint. *The sleeper slab, reinforcing bars, bond breaker, sealants for the terminal joint will not be measured. When required, removal of an existing terminal joint or sleeper slab will not be measured.*

JRCP will be measured by the square yard of the thickness specified. Reinforcing bars, the metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place in the JRCP will not be measured.

Pre-compressed foam joints will not be measured.

Retrofitted tie bars will be measured by the number of units installed.

503.08 Basis of Payment

D-1 contraction joints, *expansion joint with load transfer* and terminal joints will be paid for at the contract unit price per linear foot, complete in place.

JRCP will be paid for at the contract unit price per square yard of the thickness specified, complete in place.

Retrofitted tie bars will be paid for at the contract unit price per each, complete in place.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
D-1 Contraction Joint	LFT
Expansion Joint with Load Transfer	*LFT*
Jointed Reinforced Concrete Pavement, _____ in. thickness	*SYS*
Retrofitted Tie Bars	EACH
Terminal Joint, *Type* ____.	LFT

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

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The cost of furnishing and placing all materials, not specified as a pay item, shall be included in the cost of PCCP.

The cost of reinforcing bars, metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place shall be included in the cost of the JRCP.

For D-1 contraction joints, ~~T~~*t*he cost of dowels, dowel bar assemblies, backer rod, joint sealants and all necessary incidentals shall be included in the cost of D-1 contraction joints.

For the construction of expansion joints, the cost of dowels, dowel bar assemblies, expansion caps, joint filler, joint sealants and all necessary incidentals shall be included in the cost of the expansion joint with load transfer.

The cost of the sleeper slab, reinforcing bars, bond breaker, ~~and HMA mixtures~~*, pre-compressed foam joint, joint sealant and all necessary incidentals* shall be included in the cost of the terminal joint. *When required, removal of an existing terminal joint and sleeper slab shall be included in the cost of the terminal joint.*

The cost of retrofitted tie bars or PCCP replacement used to repair damaged PCCP due to fault or negligence, remediation of random cracking, or the replacement of broken deformed bars shall be included in the cost of the PCCP.

COMMENTS AND ACTION

111.12 Basis of Payment
702.15 Joints
SECTION 724 - STRUCTURAL EXPANSION JOINTS
906.07 Bridge Expansion Joints
Recuring Special Provision 503-R-692 JOINTS

DISCUSSION:

This item was introduced and presented by Mr. Orton, assisted by Mr. White who stated that pre-compressed foam joints are being used more frequently in bridge contracts. This joint type is also being used in all new terminal joints, as specified in RSP 503-R-692 and RPD 503-R-692d, which will be discontinued when the RSP is incorporated into the 2022 Standard Specifications. RSP 724-B-309 is currently being used as the specification for this type of joint. This type of joint is being used frequently enough that it should be incorporated into the 2022 Standard Specifications. This will also allow section 503 to be revised to include the cost of the pre-compressed foam joint in the cost of the terminal joint, which will simplify the measurement and payment of terminal joints.

Mr. Orton proposed to incorporate RSP 724-B-309 into the 2022 Standard Specifications. An Approved Products List will also be created for this joint material. Section 503 will be revised to include the pre-compressed foam joint in the cost of the terminal joint. The term Structural Expansion Joint is proposed to be changed to Bridge Expansion Joint for consistency with 906.07 and the AASHTO Bridge Design Specifications.

Prior to the meeting, Mr. Koch asked if standard drawings should be created for these types of joints so that the designers don't need to "reinvent the wheel" each time? Mr. White responded that he agrees that it may be helpful to provide some additional guidance to Designers for situations such as the retrofit of an existing ss-joint. However, there is concern that a standard drawing may give Designers the false impression that the joints don't need to be sufficiently detailed on the plans. Mr. Koch asked if including figures in the Design Manual could be an acceptable alternative to new standard drawings? Mr. White responded that, "In my experience, Detailers will re-use plan details from previous projects and modify them to fit the current situation. In other words, I don't think the amount of effort required to detail the joints on the plans is very extensive. The benefit of showing the details on every set of plans is that it's more likely that Designers will notice unique aspects of a particular installation, which may prevent problems in the field." Mr. White provided examples to further illustrate his point.
Mr. Koch stated that Design Manual details and drawings would be fine, and that, ideally, the Design Manual drawings would have sufficient details where Designers would be able to copy the basic structure and add details.

There was no further discussion and this item passed as submitted and with editorial changes as shown in these minutes.

COMMENTS AND ACTION

111.12 Basis of Payment
702.15 Joints
SECTION 724 - STRUCTURAL EXPANSION JOINTS
906.07 Bridge Expansion Joints
Recuring Special Provision 503-R-692 JOINTS

[continued]

Motion: Mr. Orton Second: Mr. Reilman Ayes: 10 Nays: 0 FHWA Approval: Yes	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 111.12 pg 127, 702.15(b) pg 596, 724 begin pg 760, 906.07 pg 962. Recurring Special Provision references in: RSP 503-R-692 (TO BE INCORPORATED INTO 2022 STANDARD SPECIFICATION), RSP 724-B-309 (PROPOSED TO BE INCORPORATED INTO 2022 STANDARD SPECIFICATION). Standard Drawing affected: E 503-BATJ (no changes required). Design Manual Sections affected: 404-2.06(03) Expansion Joints. GIFE Sections cross-references: 5.20.	X 2022 Standard Specifications X Revise Pay Items List ___ Create RSP (No.___) Effective: RSP Sunset Date: X Revise RSP (No. 503-R-692 and 724-B-309) Effective: June 1, 2021 RSP Sunset Date: 2022 SS book ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: X GIFE Update X SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Expanded polystyrene (EPS) is often shown on bridge plans at interfaces that don't need to be watertight, but need to allow for differential movement between the two components. EPS is also shown in several chapters of the Indiana Design Manual. This material is currently not covered by the Standard Specifications, which has caused some confusion during construction. It has been observed that both EPS and extruded polystyrene (XPS) are commonly used in construction and both products have performed well.

PROPOSED SOLUTION: Specifications for both EPS and XPS will be added to section 906 under 906.03 Preformed Expansion Joint Filler (PEJF), which is currently blank. Other references to expanded polystyrene will be revised to reference PEJF.

APPLICABLE STANDARD SPECIFICATIONS: 702.03, 702.15(b), 702.28, 707.12, 906.01, 906.03

APPLICABLE STANDARD DRAWINGS: E 503-BATJ-02,03, E 609-RCBA-04

APPLICABLE DESIGN MANUAL SECTION: Fig. 406-16A, Fig. 406-16B, Fig. 406-16H, 409-7.06, Fig. 409-2B, Fig. 409-2G, Fig. 409-3A, Fig. 409-3B, Fig. 409-3D, 410-5.01(07)

APPLICABLE SECTION OF GIFE: 8.7.4

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: N/A

APPLICABLE SUB-COMMITTEE ENDORSEMENT: INDOT/ASCE Structures Committee, ad-hoc committee including Jim Reilman, Mir Zaheer, Derrick Hauser, Mahmoud Hailat, Katherine Smutzer, Stephanie Wagner

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

IMPACT ANALYSIS (attach report):

Submitted By: Pete White for Mark Orton
Title: Standards Engineer
Organization: INDOT Standards and Policy
Phone Number: 317-233-3840
Date: Oct. 29, 2020

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? 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? No
- For construction workers? No

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? No
- Design process? No

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? 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: This is a commonly used material that isn't currently covered by the Standard Specifications.

REVISION TO STANDARD SPECIFICATIONS

SECTION 702 - STRUCTURAL CONCRETE
702.03 Materials
702.15 Joints
702.28 Basis of Payment
SECTION 707 - PRECAST AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS
707.12 Basis of Payment
SECTION 906 - JOINT MATERIALS
906.01 Joint Fillers
906.03 Blank

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 702, BEGIN LINE 21, INSERT AS FOLLOWS:

702.03 Materials

Materials shall be in accordance with the following:

Admixtures for Use in Concrete	912.03
Castings	910.05
Coarse Aggregate	
For exposed concrete, Class A or Higher, Size No. 8	904
For non-exposed concrete, Class B or Higher, Size No. 8	904
Curing Materials	912.01
Curing-Sealing Materials	912.02
Elastomeric Bearings	915.04
Fabric for Waterproofing	918.01
Fine Aggregate Size No. 23	904
Fly Ash	901.02
Geotextile for Use With Underdrains	918.03
Ground Granulated Blast Furnace Slag	901.03
High Density Bearing Strips	906.08
Permanent Metal Forms	910.03
Polychloroprene Joint Membrane and Adhesive	906.02(a)4
Portland Cement	901.01(b)
Preformed Expansion Joint Filler	*906.03*
Utility Asphalt, UA-1	902.01(d)
Water	913.01

SECTION 702, BEGIN LINE 915, DELETE AND INSERT AS FOLLOWS:

Structural expansion joints shall be of the form, dimensions, material, and design shown on the plans. Open expansion joints shall be completely open for the dimensions specified and for their entire length. Preformed expansion joint ~~material~~*filler*, shall be placed true and even and with abutting sections pressed together tightly. The material shall be of the size shown on the plans and shall be in accordance with 906.~~01~~*03*.

SECTION 702, BEGIN LINE 1419, DELETE AND INSERT AS FOLLOWS:

REVISION TO STANDARD SPECIFICATIONS

SECTION 702 - STRUCTURAL CONCRETE
702.03 Materials
702.15 Joints
702.28 Basis of Payment
SECTION 707 - PRECAST AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS
707.12 Basis of Payment
SECTION 906 - JOINT MATERIALS
906.01 Joint Fillers
906.03 Blank

The cost of forms, PVC for bridge floor drains, falsework, falsework piling, centering, expansion joints, *preformed expansion joint filler,* waterproofing, curing, finishing, and necessary incidentals shall be included in the cost of the pay items. The cost of placing epoxy resin adhesive on existing concrete surfaces shall be included in the cost of new concrete which abuts the existing concrete. Payment for concrete used in footings in class X excavation will be made at the contract unit price only for the cubic yards placed within the neat lines of the footings as shown on the plans or as revised.

SECTION 707, BEGIN LINE 493, DELETE 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, ~~expanded polystyrene,~~ 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, and materials necessary to prepare and cure the test specimens required for work in this section shall be included in the cost of the pay items in this section.

SECTION 906, BEGIN LINE 3, DELETE AS FOLLOWS:

906.01 Joint Fillers

Joint fillers shall be preformed materials intended to be used in PCCP ~~and bridge joints~~ or as otherwise specified. Joint fillers shall be in accordance with AASHTO M213 or ASTM D8139.

SECTION 906, BEGIN LINE 107, DELETE AND INSERT AS FOLLOWS:

906.03 ~~Blank~~*Preformed Expansion Joint Filler*

Preformed expansion joint filler, PEJF, shall be preformed materials intended to be used at bridge component interfaces that are not required to be water tight. PEJF shall be either extruded polystyrene, XPS, or expanded polystyrene, EPS in accordance with ASTM C578. The compressive resistance shall be less than 40 psi, as measured in accordance with ASTM D1621. Water absorption shall be less than 1%, as measured in accordance with ASTM C272. PEJF will be by accepted by visual inspection.

COMMENTS AND ACTION

702.03 Materials
702.15 Joints
702.28 Basis of Payment
707.12 Basis of Payment
906.01 Joint Fillers
906.03 Blank

DISCUSSION:

Mr. Orton introduced and presented this item, with the help of Mr. White who explained that expanded polystyrene, EPS, is often shown on bridge plans at interfaces that don't need to be watertight, but need to allow for differential movement between the two components. EPS is also shown in several chapters of the Indiana Design Manual. Mr. White stated that this material is currently not covered by the Standard Specifications, which has caused some confusion during construction. It has been observed that both EPS and extruded polystyrene, XPS, are commonly used in construction and both products have performed well.

Mr. Orton proposed that language regarding both EPS and XPS be added to 906.03 Preformed Expansion Joint Filler, PEJF, as shown above. Other references to expanded polystyrene will be revised to reference PEJF.

Mr. White and Mr. Orton agreed that no RSP is necessary. There was no further discussion and this item passed as submitted.

Motion: Mr. Orton Second: Mr. Boruff Ayes: 10 Nays: 0 FHWA Approval: Yes	Action: X Passed as Submitted ___ Passed as Revised ___ Withdrawn
Standard Specifications Sections referenced and/or affected: 702.03, 702.15(b), 702.28, 707.12, 906.01, 906.03. Recurring Special Provision references in: NONE Standard Drawing affected: E 503-BATJ-02,03, E 609-RCBA-04. Design Manual Sections affected: Fig. 406-16A, Fig. 406-16B, Fig. 406-16H, 409-7.06, Fig. 409-2B, Fig. 409-2G, Fig. 409-3A, Fig. 409-3B, Fig. 409-3D, 410-5.01(07). GIFE Sections cross-references: 8.7.4.	X 2022 Standard Specifications ___ Revise Pay Items List ___ Create RSP (No.___) Effective: __ RSP Sunset Date: ___ Revise RSP (No.___) Effective: RSP Sunset Date: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update X SiteManager Update