INDIANA DEPARTMENT OF TRANSPORTATION
Driving Indiana's Economic Growth

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Mitchell E. Daniels, Jr., Governor
Michael B. Cline, Commissioner

AGENDA

November 16, 2011 Standards Committee Meeting

MEMORANDUM

November 02, 2011

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Agenda for the November 16, 2011 Standards Committee Meeting

A Standards Committee meeting is scheduled for 09:00 a.m. on November 16, 2011 in the N955 Bay Window Conference Room. Please enter meeting through the double doors directly in front of the conference room.

The following agenda items are listed for consideration.

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. Approval of Minutes from October 20, 2011 meeting

2. Schedule of Standards Committee meetings for 2012-2013

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

(No items on this agenda)

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

OLD BUSINESS

Item No. 03 10/20/11 (2012 SS)	Mr. Strain	pg 05
Recurring Special Provision		
737-B-188	*WELDED WIRE REINFORCEMENT*	
Item No. 08 10/20/11 (2012 SS)	Mr. Walker	pg 11
Recurring Special Provision		
910-X-XXX	*WELDED WIRE REINFORCEMENT MATERIALS*	

NEW BUSINESS

Item No. 01 11/16/11 (2012 SS)	Mr. Pankow	pg 15
Recurring Special Provision		
700-X-XXX	*WWR USED IN REINFORCED CONCRETE BOX AND THREE-SIDED STRUCTURES*	
Item No. 02 11/16/11 (2012 SS)	Mr. Strain	pg 18
Recurring Special Provision		
706-X-XXX	*BRIDGE RAILING*	
Item No. 03 11/16/11 (2012 SS)	Mr. Andrewski	pg 22
SECTION 408	SEALING CRACKS AND JOINTS	
Item No. 04 11/16/11 (2012 SS)	Mr. Andrewski	pg 26
Recurring Special Provision		
411-R-432	WARRANTED MICRO-SURFACING	
Item No. 05 11/16/11 (2012 SS)	Mr. Boruff	pg 40
Standard Drawing		
807-LTST-02	ALUMINUM LIGHT POLE WITH TRANSFORMER BASE	
Item No. 06 10/20/11 (2012 SS)	Mr. Strain	pg 45
Standard Drawings		
726-BEBP-03	*BRIDGE ELASTOMERIC BEARING PADS TYPE TH1-TH4 FOR PRESTRESSED WIDE-FLANGE BULB-TEE BEAMS*	
726-BEBP-0~~3~~*4*	BRIDGE ELASTOMERIC BEARING PADS TYPE S - FOR STEEL BEAMS	
726-BEBP-0~~4~~*5*	ELASTOMERIC BEARING PADS TYPE S	

cc: Committee Members (11)
FHWA (2)
ICA (1)

INDOT Standards Committee
Schedule of Meetings, Submittals, and Distributions

Revised 11/16/11

Standards Committee Meeting Date	Agenda Items Due[1]	Agenda Distributed & Published	First Draft Minutes Distributed	Comments Due for Draft Minutes	Final Draft Minutes Distributed	Approved Minutes Published
	(-24 days)	(-17days)	(+6 days)	(+13 days)	(+21 days)	(+35-42 days)
12/15/11	11/21/11	11/28/11	12/21/11	12/28/11	01/05/12	01/26/12
01/19/12	12/27/11	01/02/12	01/25/12	02/01/12	02/09/12	02/23/12
02/16/12	01/23/12	01/30/12	02/22/12	02/29/12	03/08/12	03/22/12
03/15/12	02/20/12	02/27/12	03/21/12	03/28/12	04/05/12	04/26/12
04/19/12	03/26/12	04/02/12	04/25/12	05/02/12	05/10/12	05/24/12
05/17/12	04/23/12	04/30/12	05/23/12	05/30/12	06/07/12	06/28/12
06/21/12	05/29/12	06/04/12	06/27/12	07/05/12	07/12/12	07/26/12
07/19/12	06/25/12	07/02/12	07/25/12	08/01/12	08/09/12	08/23/12
08/16/12	07/23/12	07/30/12	08/22/12	08/29/12	09/06/12	09/27/12
09/20/12	08/27/12	09/03/12	09/26/12	10/03/12	10/11/12	10/25/12
10/18/12	09/24/12	10/01/12	10/24/12	10/31/12	11/08/12	11/26/12
11/15/12	10/22/12	10/29/12	11/21/12	11/28/12	12/06/12	12/27/12
12/20/12	11/26/12	12/03/12	12/26/12	01/02/13	01/10/13	01/24/13
01/17/13	12/26/12	01/02/13	01/23/13	01/30/13	02/07/13	02/28/13
02/21/13	01/28/13	02/04/13	02/27/13	03/06/13	03/14/13	03/28/13
03/21/13	02/25/13	03/04/13	03/27/13	04/03/13	04/11/13	04/25/13
05/16/13[2]	03/25/13	04/01/13	04/24/13	05/01/13	05/09/13	05/23/13
05/16/13	04/22/13	04/29/13	05/22/13	05/29/13	06/06/13	06/27/13
06/20/13	05/28/13	06/03/13	06/26/13	07/03/13	07/11/13	07/25/13

GENERAL BUSINESS

STANDARDS COMMITTEE MEETINGS SCHEDULE FOR 2012-2013

(continued)

07/18/13	06/24/13	07/01/13	07/24/13	07/31/13	08/08/13	08/22/13
08/15/13	07/22/13	07/29/13	08/21/13	08/28/13	09/05/13	09/26/13
09/19/13	08/26/13	09/03/13	09/25/13	10/02/13	10/11/13	10/24/13
10/17/13	09/23/13	09/30/13	10/23/13	10/30/13	11/07/13	12/02/13
11/21/13	12/02/13	11/04/13	11/27/13	12/04/13	12/12/13	12/26/13
12/19/13	11/25/13	12/02/13	12/26/13	01/02/14	01/09/14	01/23/14

Notes:
1. Agenda items must be submitted by the due date shown, and be accompanied by a Proposal sheet.
2. The May meeting is the last opportunity for approval of items to be included in September Edition as Recurring Special Provisions (2014 Standard Specifications).
3. Shaded dates are exceptions to regular schedule.

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS (OLD BUSINESS ITEM)

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The Department is interested in procedures and materials that will accelerate the process of construction. A product which can aid the Department in this endeavor is Welded Wire Reinforcement (WWR). This product has been used in other states in prestressed concrete beams and bridge decks.

PROPOSED SOLUTION: Add a special provision for WWR to permit its substitution for reinforcing bars in bridge superstructures, reinforced concrete bridge approaches, crashwalls, and retaining walls. WWR can be used where methods of accelerating construction are desired. Suggested basis for use: pay item for reinforcing bars in work addressed in Std Spec Sections 609, 704, 706, and 707.

APPLICABLE STANDARD SPECIFICATIONS: New 737

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: New 737-B-xxx provision

PAY ITEMS AFFECTED: Reinforcing bars

Submitted By: Randy Strain

Title: Bridge Standard & Policy Engineer

Organization: INDOT Technical Support

Phone Number: 232-33390-7251

Date: September 23, 2011

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc committee consisting of Kenny Anderson, Jim Reilman, Randy Strain, Tony Uremovich, and Todd Hawkinson representing the WWR industry.

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSED NEW 737-B-188 WELDED WIRE REINFORCEMENT

737-B-188 WELDED WIRE REINFORCEMENT

(Adopted XX-XX-11)

The Standard Specifications are revised as follows:

SECTION 737, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 737 - WELDED WIRE REINFORCEMENT

737.01 Description

This work shall consist of furnishing and placing WWR as an alternative to furnishing and placing reinforcing bars in concrete structural members, bridge decks, bridge railings, reinforced concrete bridge approaches, crash walls, and cast-in-place retaining walls in accordance with 105.03.

MATERIALS

737.02 Materials

Materials shall be in accordance with the following:

Steel WWR, Deformed.....910.01(b)6
Steel WWR, Smooth.....910.01(b)5

CONSTRUCTION REQUIREMENTS

737.03 Design Requirements

The nominal yield strength shall be the minimum as specified for the grade of steel selected, except that the maximum nominal yield strength used for design purposes shall not exceed 75 ksi (520 MPa). The nominal yield strength shall not be less than 65 ksi (450 MPa) for smooth WWR and 70 ksi (480 MPa) for deformed WWR. The area of steel in the longitudinal and transverse directions may be reduced in proportion to the nominal yield strength specified for the grade of steel up to the maximum allowable. For purposes of crack control, spacing of reinforcement in the WWR sheet shall not be greater than 8 in. (200 mm) in either direction.

If the plans show uncoated reinforcing bars, the Contractor shall use uncoated WWR. If the plans show epoxy coated reinforcing bars, the Contractor may elect to supply either epoxy coated or galvanized WWR.

737.04 Working Drawings

Working drawings shall be submitted for approval in accordance with 105.02. Fabrication shall not begin until the working drawings are approved.

737.05 Fabrication

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSED NEW 737-B-188 WELDED WIRE REINFORCEMENT

WWR shall be cut and bent to the shapes shown on the working drawings. All WWR shall be cold bent, unless otherwise permitted by the Engineer. Hook dimensions and diameters of bends shall be as shown on the working drawings. WWR partially embedded in concrete shall not be field bent, except as shown on the approved working drawings or permitted by the Engineer. Coated WWR shall not be field cut, unless permitted by the Engineer. If permitted, field cutting of coated WWR shall be performed using hydraulic-powered or friction cutting tools to minimize coating damage and field touch-up. Field cut coated WWR shall be repaired with compatible patching material that is deemed suitable for repairs in the field. Flame cutting of coated WWR will not be permitted.

737.06 Handling and Storage

All WWR shall be handled and stored by methods that will not damage the coating or WWR, and in accordance with the applicable requirements of 703.04. Bundles shall not be dropped or dragged. WWR shall be transported and stored so as to not damage the applied coating. The coated WWR shall not be exposed to fire or flame.

Prior to placement of concrete, all WWR shall be free from dirt, loose rust or scale, mortar, paint, grease, oil, or other materials that can reduce bond. Coated WWR shall be free from cracks or laminations. For non-coated WWR, bonded rust, surface irregularities, or mill scale will not be cause for rejection, provided the minimum dimensions, cross sectional area, and tensile properties of the WWR specimen satisfy the physical requirements for the size and grade of WWR specified.

737.07 Placing and Securing

WWR shall be placed as shown on the approved working drawings and held in position during the placing and finishing of concrete. WWR shall be lapped and tied around the perimeter of each sheet in order to maintain proper positioning of the WWR. Lap splices shall have a minimum of two ties per spliced length. Unless otherwise shown on the approved working drawings, WWR sheets shall overlap a minimum of 8 in. (200 mm) in each direction to make a splice. Plastic or wire bar supports, such as chairs and bolsters, shall be in accordance with the requirements herein and industry practice as described in the Wire Reinforcing Institute, WRI, WWR-500, Manual of Standard Practice, or TF 702, – Supporting WWR. All metal bolsters or chairs which bear against the forms for exposed surfaces shall be equipped with snug fitting, high density, polyethylene tips which provide 1/2 in. (13 mm) minimum clearance between the metal and an exposed surface. The spacing of slab bolster rows and high chair rows for deck slabs shall be as described in the WRI WWR-500, Manual of Standard Practice, or TF 702, Supporting WWR unless otherwise directed. For epoxy-coated WWR, tie wires, chair and bar supports, and metal clips shall be epoxy, plastic, or nylon coated. For galvanized WWR, tie wires, chair and bar supports, and metal clips shall be plastic coated or hot dipped galvanized after fabrication in accordance with ASTM A 1060. Tie-down bars shall be placed as shown on the approved working drawings. With the exception of tie-down bars, tack welding will not be permitted, unless shown on the approved working drawings.

WWR shall be supported in its specified position by use of plastic or wire bar supports, supplementary tie-down bars, side-form spacers, or other approved devices. Such devices shall be placed at intervals so as to maintain the WWR cover as shown on the approved working drawings. Platforms for the support of workers and equipment during concrete placement shall be supported directly by the forms and shall not alter the positioning of the WWR.

737.08 Repair of Coated WWR

All damaged, cut, or otherwise compromised areas of the coating shall be repaired.

(a) Epoxy-Coated

In addition to the requirements of ASTM D 3963, all visible damage, i.e., scratches, nicks, cracks, to the epoxy coating caused during shipment, storage, or placement shall be repaired on the project site with approved patching material. Ends of WWR that have been sheared, sawed, or cut by other means shall be coated with approved patching material. Areas on the WWR sheets and tie-down bars damaged due to welding shall be repaired with approved patching material. Patching of damaged areas shall be performed in accordance with the patching material manufacturer's recommendations. If the damaged surface area exceeds 10% of the total WWR sheet surface area, the sheet shall be removed and replaced with an acceptable sheet. All patching material shall be fully cured prior to placing concrete. Patching material shall be compatible with the epoxy coating, deemed inert in concrete, and deemed suitable for repairs in the field. Patching material shall be identified on the container as satisfying ASTM D 3963, Annex A1, or shall be accompanied by a type C certification in accordance with 916 certifying that the material satisfies or exceeds the requirements of Annex A1.

(b) Galvanized

All visible damage, i.e., scratches, nicks, cracks, to the galvanized coating caused during shipment, storage, or placement shall be repaired on the project site in accordance with ASTM A 1060. Ends of WWR that have been sheared, sawed, or cut by other means shall be coated. Areas on the WWR sheets and tie-down bars damaged due to welding shall be repaired and recoated. Field coating of damaged areas shall be performed in accordance with the coating manufacturer's recommendations. Zinc coating shall be in accordance with ASTM A 1060. It shall be applied to achieve a dry film equal to or exceeding that designated in ASTM A 1060. All touchup coating material shall be fully cured prior to placing concrete.

737.09 Final Inspection

After being placed, WWR shall be subject to approval of the Engineer before beginning concrete placement. Concrete placed prior to approval of the WWR will be subject to rejection and removal.

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSED NEW 737-B-188 WELDED WIRE REINFORCEMENT

737.10 Method of Measurement

This work will not be measured for payment.

737.11 Basis of Payment

The accepted quantity for payment will be the quantity for reinforcing bars or epoxy-coated reinforcing bars shown on the plans. This work will be paid for as reinforcing bars or epoxy-coated reinforcing bars in accordance with 703.08, regardless of whether the WWR design results in a reinforcement weight (mass) that is different from that shown on the plans.

If reinforcing bars or epoxy-coated reinforcing bars are not paid for separately, but instead included in the cost of a pay item, and WWR is substituted for reinforcing bars or epoxy-coated reinforcing bars, the WWR will not be paid separately, but shall be included in the cost of the pay item.

If galvanized WWR is supplied, it will be paid for as epoxy-coated reinforcing bars.

The cost of tie wires, chair and bar supports, metal clips, spacers, or other mechanical means used for fastening or holding WWR in place, and laps shall be included in the cost of WWR. The cost of epoxy-coating materials or galvanizing materials and repair of damaged or removed coating materials on WWR and on tie wires, chair and bar supports, metal clips, spacers, or other mechanical means used for fastening or holding WWR in place, and laps shall be included in the cost of WWR.

COMMENTS AND ACTION (OLD BUSINESS ITEM)

737-B-188 WELDED WIRE REINFORCEMENT

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: NONE Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

Mr. Walker
Date: 11/16/11

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS (OLD BUSINESS ITEM)

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: ASTMs A82, A185, A496 and A497 have been made obsolete by ASTM A1064. In addition, it has been decided to allow epoxy coated or galvanized WWR in some applications. These ASTMs have been referenced by 901.01(b)5 and 901.01(b)6.

PROPOSED SOLUTION: Create a new RSP effective for any contract. The material is referenced in 616, 708, 714, 723, 731, 734, 735 and the proposed 737 RSP. Changes to 901.01(b)5 and 901.01(b)6 will support the desired material for RSP 737 and make current the material specifications for WWR in the above sections of the Standard Specifications.

APPLICABLE STANDARD SPECIFICATIONS: 910.01(b)5, 910.01(b)6

APPLICABLE STANDARD DRAWINGS: None affected

APPLICABLE DESIGN MANUAL SECTION: None affected

APPLICABLE SECTION OF GIFE: None affected

APPLICABLE RECURRING SPECIAL PROVISIONS: None affected

PAY ITEMS AFFECTED: None affected

Submitted By: Ron Walker

Title: Manager, Office of Materials Management

Organization: INDOT

Phone Number: 610-7251

Date: 10/25/2011

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc committee consisting of Kenny Anderson, Jim Reilman, Randy Strain, Tony Uremovich, and Todd Hawkinson representing the WWR industry.

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSED NEW 910-X-XXX WELDED WIRE REINFORCEMENT MATERIALS

910-X-XXX WELDED WIRE REINFORCEMENT MATERIALS

(Adopted XX-XX-XX)

The Standard Specifications are revised as follows:

SECTION 910, LINE 50, DELETE AND INSERT AS FOLLOWS:

5. Steel ~~Welded Wire Reinforcement~~ *WWR*, Smooth

Smooth steel ~~welded wire reinforcement~~ *WWR* shall be in accordance with ASTM ~~A 185~~ *A 1064*, except as follows~~.~~*:*

a. The wire used in manufacturing the ~~welded wire reinforcement~~ *WWR* shall be ~~as~~ drawn, not galvanized, unless otherwise specified.

b. ~~The welded wire reinforcement~~ *WWR* shall be furnished in flat sheets. ~~unless otherwise permitted or specified~~.

c. ~~Weld shear tests of welded wire reinforcement shall be performed by the manufacturer on the test specimens obtained for testing tensile properties in accordance with the Frequency Manual. If there is weld shear failure, additional test specimens shall be tested in accordance with ASTM A 185~~. *When epoxy-coated WWR is specified, it shall receive a type 1 coating in accordance with ASTM A 884. Repairing or patching of the coating shall be in accordance with ASTM A 884. The average coating thickness shall be 9 to 14 mils (225 to 350 µm) after cure.*

d. When galvanized WWR is specified, it shall be in accordance with ASTM A 1060, including repair or renovation of the coating. It shall be coated after fabrication.

6. Steel ~~Welded Wire Reinforcement~~ *WWR*, Deformed

Deformed steel ~~welded wire reinforcement~~ *WWR* shall be in accordance with ASTM ~~A 497~~ *A 1064*, except as follows~~.~~*:*

a. The wire used in manufacturing the ~~welded wire reinforcement~~ *WWR* shall be ~~in accordance with ASTM A 496~~*drawn, not galvanized, unless otherwise specified*.

b. ~~The welded wire reinforcement~~ *WWR* shall be furnished in flat sheets. ~~unless otherwise specified or permitted.~~

REVISION TO SPECIAL PROVISIONS (OLD BUSINESS ITEM)

PROPOSED NEW 910-X-XXX WELDED WIRE REINFORCEMENT MATERIALS

c. ~~Weld shear tests of welded wire reinforcement shall be performed by the manufacturer on the test specimens obtained for testing tensile properties in accordance with the Frequency Manual. If there is shear failure, additional test specimens shall be tested in accordance with ASTM A 497~~. *When epoxy-coated WWR is specified, it shall receive a type 1 coating in accordance with ASTM A 884. Repairing or patching of the coating shall be in accordance with ASTM A 884. The average coating thickness shall be 9 to 14 mils (225 to 350 µm) after cure.*

d. When galvanized WWR is specified, it shall be in accordance with ASTM A 1060, including repair or renovation of the coating. It shall be coated after fabrication.

COMMENTS AND ACTION (OLD BUSINESS ITEM)

910-X-XXX WELDED WIRE REINFORCEMENT MATERIALS

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections references: Sections: 606 pg 382; 608 pg 385; 616 pg 402, 403, 406; 708 pg 542, 544; 703 pg 518, 519; 707 pg 540, 542; 714 pg 588; 723 pg 649, 650; 731 pg 676; 734 pg 687, 688; 735 pg 691; 910 pg 872, 881. Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

Mr. Pankow
Date: 11/16/11

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: ASTM updates have resulted in the need to update the WWR 910.01 references. This has now created a conflict with the WWR language contained in 714.02 & 723.02.

PROPOSED SOLUTION: Adopt the proposed deletions to the 714.02 and 723.02 sections in order to eliminate the conflict.

APPLICABLE STANDARD SPECIFICATIONS: 714.02 and 723.02

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 700-x-xxx recurring special provision

PAY ITEMS AFFECTED: None

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT

Phone Number: 2-5502

Date: October 25, 2011

APPLICABLE SUB-COMMITTEE ENDORSEMENT: None

REVISION TO SPECIAL PROVISIONS

PROPOSED NEW 700-X-XXX WWR USED IN REINFORCED CONCRETE BOX AND THREE-SIDED STRUCTURES

700-X-XXX WWR USED IN REINFORCED CONCRETE BOX AND THREE-SIDED STRUCTURES

(Adopted xx-xx-xx)

The Standard Specifications are revised as follows:

SECTION 714, BEGIN LINE 68, DELETE AS FOLLOWS:

Unless otherwise specified herein, reinforcement may consist of either reinforcing bars or WWR. If specified to be coated, WWR shall be coated with either galvanized coating or epoxy coating, and reinforcing bars shall be coated with epoxy coating. ~~Epoxy coated WWR shall be coated with Type I coating with Class A minimum coating thickness in accordance with ASTM A 884. Galvanized WWR shall be coated in accordance with ASTM A 123 and shall have a minimum coating grade of 35.~~ For WWR, material with minimum yield strength of 65 ksi (448 MPa) shall be used.

SECTION 723, BEGIN LINE 72, DELETE AS FOLLOWS:

Unless otherwise specified herein, reinforcement may consist of either reinforcing bars or welded wire reinforcement, WWR. If specified to be coated, WWR shall be coated with either galvanized coating or epoxy coating, and reinforcing bars shall be coated with epoxy coating. ~~Epoxy coated WWR shall be coated with Type I coating with Class A minimum coating thickness in accordance with ASTM A 884. Galvanized WWR shall be coated in accordance with ASTM A 123 and shall have a minimum coating grade of 35.~~ For WWR, material with minimum yield strength of 65 ksi (448 MPa) shall be used.

COMMENTS AND ACTION

700-X-XXX WWR USED IN REINFORCED CONCRETE BOX AND THREE-SIDED STRUCTURES

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections references: 714.02 pg 589; 723.02 pg 650. Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y___N___ By ____ Addition or ____ Revision Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: There has been some confusion regarding, method of measurement, basis of payment and pay items for some of the various bridge railing types.

PROPOSED SOLUTION: Create the appropriate pay items to have a pay item for every allowable bridge rail type. Also, better identify the method of measure and basis of payment for some of the bridge railing types.

APPLICABLE STANDARD SPECIFICATIONS: 706

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: 17-5.01(04)

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 706-x-xxx recurring special provision

PAY ITEMS AFFECTED: obsolete 4 pay items that refer to concrete railing by the class of concrete (706-51020, 706-51025, 706-94947, and 706-92612).
Create 5 new pay items to pay for the steel portion of the PF, PS, and TF series of railing and create 1 new pay item to pay for the concrete portion of the CF railing.

Submitted By: Randy Strain

Title: Bridge Standard & Policy Engineer

Organization: INDOT

Phone Number: 232-3339

Date: October 25, 2011

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc committee consisting of: Jim Reilman, Randy Strain, and Tony Uremovich

REVISION TO SPECIAL PROVISIONS

PROPOSED NEW 706-X-XXX BRIDGE RAILING

706-X-XXX BRIDGE RAILING

(Adopted XX-XX-XX)

The Standard Specifications are revised as follows:

SECTION 706, BEGIN LINE 64, DELETE AND INSERT AS FOLLOWS:

~~All c~~*C*oncrete bridge railing~~s~~ *types FC and FT* shall be reflectorized in accordance with 602.03(f).

SECTION 706, BEGIN LINE 105, DELETE AND INSERT AS FOLLOWS:

706.06 Method of Measurement

Concrete railing, including all concrete work above the top of curb, will be measured by the linear foot (meter) ~~or by the cubic yard (cubic meter)~~ in accordance with the dimensions shown on the plans. No deductions will be made for reinforcing bars or joints. Concrete bridge railing transition will be measured per each for the type specified.

~~Reinforced concrete moment slabs will be measured by the square yard (square meter) for the thickness specified. Underdrains for MSE walls placed under moment slabs will be measured in accordance with 718.09. Type D-1 contraction joints will be measured in accordance with 503.07.~~

Reinforcing bars in the railing will be measured in accordance with 703.07.

Barrier delineators will be measured in accordance with 602.05.

Steel railing will be measured by the linear foot (meter) in accordance with the dimensions shown on the plans or as directed.

Where a bridge railing type includes both a concrete component and a steel component, both the concrete component and steel component will be measured separately as described in this section. The measurement of the steel component will include the steel railing portions that are mounted to the concrete bridge railing transition.

Linear measurements will be made from end to end of the railing along the centerline *of the railing*.

Reinforced concrete moment slabs will be measured by the square yard (square meter) for the thickness specified. Underdrains for MSE walls placed under moment slabs will be measured in accordance with 718.09. Type D-1 contraction joints will be measured in accordance with 503.07.

706.07 Basis of Payment

The accepted quantities of concrete railing will be paid for at the contract price per linear foot (meter)~~ or cubic yard (cubic meter)~~, for railing, concrete, of the type

REVISION TO SPECIAL PROVISIONS

PROPOSED NEW 706-X-XXX BRIDGE RAILING

specified. *Concrete bridge railing transitions will be paid for at the contract unit price per each for the type specified. Reinforcing bars for concrete railings and concrete bridge railing transitions will be paid for in accordance with 703.08. Barrier delineator will be paid for in accordance with 602.06.* Steel railing will be paid for at the contract unit price per linear foot (meter) of the type specified. *Where a bridge railing type includes both a concrete component and a steel component, both the concrete component and steel component will be paid for separately by each component as described in this section.* ~~Concrete bridge railing transitions will be paid for at the contract unit price per each for the type specified.~~ Reinforced concrete moment slabs will be paid for at the contract unit price per square yard (square meter) for the thickness specified, complete in place. Underdrains for MSE walls placed under moment slabs will be paid for in accordance with 718.10. Type D-1 contraction joints will be paid for in accordance with 503.08. ~~Reinforcing bars for concrete railings and concrete bridge railing transitions will be paid for in accordance with 703.08. Barrier delineator will be paid for in accordance with 602.06.~~

SECTION 706, BEGIN LINE 147, DELETE AND INSERT AS FOLLOWS:

~~Railing, Steel ____ type ..... LFT (m)~~

Railing, Concrete, ____ type ..... LFT (m) ~~CYS (m3)~~

Railing, Steel, ____ type ..... LFT (m)

SECTION 706, AFTER LINE 156, INSERT AS FOLLOWS:

The costs of anchor bolts, base plates, posts, rail elements, connecting hardware, and other incidentals necessary to complete the installation of the railing as shown on the plans shall be included in the cost of railing, steel, of the type specified.

COMMENTS AND ACTION

706-X-XXX BRIDGE RAILING

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections references: SECTION 706 begins pg 525. Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: SECTION 17-5.01(04) GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

Mr. Andrewski
Date: 11/16/11

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: INDOT's warranted mircosurface special provision 411.06 Preparation of Surfaces currently states the contractor shall be responsible for all surface preparation that may affect the performance of to meet the requirements for the warranted micro-surfacing including, but not limited to compatibility of crack sealing materials when the contract includes crack sealing prior to micro-surfacing. Our qualified contractors believe the most compatible crack sealant with micro-surfacing is the fiberized crack sealant. The contractors feel they are left with an INDOT approved crack sealant that is not very compatible with micro-surfacing. They wish to be able to certify the fiber added to the AC so that it will show up on the approved products list and not interfere with final payment of the crackseal. Current contracts have a separate item for the crack sealing and fibers are technically not allowed per the current specifications.

PROPOSED SOLUTION: Revise Standard Specification Section 408- Sealing Cracks and Joints to allow the use of fibers in crack sealing for use in conjunction with microsurface treatments only.

APPLICABLE STANDARD SPECIFICATIONS: Section 408- Sealing Cracks & Joints

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION:

APPLICABLE SECTION OF GIFE: Unknown

APPLICABLE RECURRING SPECIAL PROVISIONS:

Submitted By: Dave Andrewski

Title: Manager, Office of Pavement Engineering

Organization: INDOT

Phone Number: 317-232-5452

Date: May 10, 2011

APPLICABLE SUB-COMMITTEE ENDORSEMENT?
This revision was done with a small committee consisting of Todd Shields, Mike Prather, Jeremy VanVleet, Matt Beeson and Bill Tompkins. Our qualified contractors were invited to comment. .

(Proposed changes shown as highlighted in gray)

SECTION 408 – SEALING CRACKS AND JOINTS

408.01 Description

This work shall consist of sealing longitudinal and transverse cracks and joints in existing asphalt pavement in accordance with 105.03.

MATERIALS

408.02 Materials

Materials shall be in accordance with the following:

Asphalt Binder for Crack Sealing, PG 64-22*	902.01(a)
Asphalt Emulsion for Crack Sealing, AE-90, AE-90S, AE-150	902.01(b)
Fine Aggregates, No. 23 or 24	904
Joint Sealing Materials	906.02

** Polypropylene fibers shall be used only in conjunction with a Microsurface treatment.*

CONSTRUCTION REQUIREMENTS

408.03 Equipment

A distributor in accordance with 409.03 shall be used when crack sealing and an indirect-heat double boiler kettle with mechanical agitator shall be used when routing and filling. Air compressors shall be capable of producing a minimum air pressure of 100 psi (690 kPa).

408.04 Weather Limitations

Sealing or filling operations shall not be conducted on a wet surface, when the ambient temperature is below 40°F (4°C), or when other unsuitable conditions exist, unless approved by the Engineer.

408.05 Routing and Filling Cracks and Joints

Cracks and joints shall be routed when specified, with a routing machine capable of cutting a uniform shape to form a reservoir not exceeding 3/4 in. (19 mm) wide with a minimum depth of 3/4 in. (19 mm). The operation shall be coordinated such that routed materials do not encroach on pavement lanes carrying traffic and all routed materials are disposed of in accordance with 104.07. Cracks and joints shall be filled with hot poured joint sealant to within 1/4 in. (6 mm) of the surface in accordance with the manufacturer's recommendations.

408.06 Sealing Cracks and Joints

Cracks and joints shall be cleaned by blowing with compressed air or by other suitable means. Asphalt material shall be placed utilizing a "V" shaped wand tip, to allow

the penetration of the materials into the cracks and joints. The cracks and joints shall be completely filled or overbanded not to exceed 5 in. (125 mm), or as required. All excess asphalt material shall be removed from the pavement. The sealed cracks and joints shall be covered with sufficient fine aggregate to prevent tracking of the asphalt materials. All excess cover material shall be removed from the pavement.

Application of asphalt materials shall be completed without covering existing pavement markings. When traffic is to be maintained within the limits of the section, temporary traffic control measures in accordance with 801 shall be used. Treated areas shall not be opened to traffic until the asphalt material has been absorbed.

408.07 Method of Measurement

Sealing and filling of cracks and joints in asphalt pavements will be measured by the ton (megagram) of material used. Routing of cracks and joints will not be measured.

Temporary traffic control measures will be measured in accordance with 801.17.

408.08 Basis of Payment

Sealing and filling of cracks and joints in asphalt pavements will be paid for by the ton (megagram) of material used for the type specified.

Temporary traffic control measures will be paid for in accordance with 801.18.

Payment will be made under:

Pay Item	Pay Unit Symbol
Cracks and Joints in Asphalt Pavement, Seal	TON (Mg)
Cracks and Joints in Asphalt Pavement, Rout and Seal	TON (Mg)

The cost of all materials, cover aggregate, cleaning, and all necessary incidentals shall be included in the cost of the pay items in this section.

COMMENTS AND ACTION

SECTION 408 – SEALING CRACKS AND JOINTS

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections references: SECTION 408 begins pg 275. Recurring Special Provision affected: NONE Standard Sheets affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision Received FHWA Approval? ____

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS

REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Revised/Updated specification. Current specification was last revised May 2009 and revisions and updates were needed. Since 2007 INDOT has completed or scheduled to let 53 microsurface projects. Due to the amount of use we are requesting to move this from a recurring special provision to a standard specification.

PROPOSED SOLUTION: Revised specification will provide a better end product by specifying type of equipment requirements, updating preparation and finished pavement language, added pay items for approaches, minor adjustments to warranty section and minor update to pavement distress threshold. Move to standard specification status due to historical and future use demands.

APPLICABLE STANDARD SPECIFICATIONS:

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: 52-11.0

APPLICABLE SECTION OF GIFE: Unknown

APPLICABLE RECURRING SPECIAL PROVISIONS: 411-R-432

PAY ITEMS AFFECTED:

Submitted By: Dave Andrewski

Title: Manager, Office of Pavement Engineering

Organization: INDOT

Phone Number: 317-232-5452

Date: May 10, 2011

APPLICABLE SUB-COMMITTEE ENDORSEMENT: This revision was completed by the Pavement Preservation Subcommittee (Todd Shields, Bill Tompkins, Jeremy VanVleet, Scott Trammell, Doug Moser, Dave Dallas, Dave Andrewski, Jeff James, Mike Prather, Tom Duncan, Tommy Nantung, Kerry Land, Ju Sang Lee, Khalil Dughaish,Matt Beeson). The spec was also sent to our qualified contractors for comments and suggestions.

REVISION TO SPECIAL PROVISIONS

PROPOSED REVISED 411-R-432 WARRANTED MICRO-SURFACING

(Proposed changes shown as highlighted in gray)

411-R-432 WARRANTED MICRO-SURFACING

(Revised XX-XX-11)

The Standard Specifications are revised as follows:

SECTION 411, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 411 – WARRANTED MICRO-SURFACING

411.01 Description

This work shall consist of furnishing materials and the construction of warranted micro-surfacing in accordance with 105.03. Multiple course micro-surfacing shall consist of a surface course over a rut fill or leveling course. Single course micro-surfacing shall consist of a surface course.

The Contractor shall be responsible for the warranted micro-surfacing for a period of 3 years after the date all warranted micro-surfacing is completed and open to unrestricted traffic.

MATERIALS

411.02 Materials

Materials shall be in accordance with the following:

*Asphalt Emulsion .....As Defined**
*Coarse Aggregates – Class B or Higher **.....904*
*Fine Aggregates*** 904*
Portland Cement, Type I .....901.01(b)
Water 913.01

* *Polymer Modified Asphalt Emulsion shall be a quick-set, CSS-1h emulsion in accordance with AASHTO M 208 except the cement-mixing test is waived. The polymer material shall be milled or blended into the asphalt or blended into the emulsifier solution prior to the emulsification process. The minimum polymer solids content will be 3.0% based on the residual of the emulsion. Mix set additives shall be added as required to provide control of the quick-set properties. Additional requirements shall be in accordance with the following:*

Characteristics	*Test Method*	*Requirement*
Residue (Note 1)	*AASHTO T 59*	*62+*
Softening Point, °F (°C)	*AASHTO T 53*	*140+ (60+)*
Viscosity @140°F (60°C)	*AASHTO T 202*	*8000+*
Elastic Recovery @ 77°F (25°C)	*AASHTO T 301*	*60*
NOTE 1. The temperature for this test shall be held below 180°F (82°C). The sample is oven evaporated on a glass plate at 77°F (25°C) for 24 h (forced draft oven). Material is then scraped from the plate with a razor blade tool.		

** *The coarse aggregate angularity shall be a minimum of 95% in accordance with ASTM D 5821. The coarse aggregate for rut fill shall be limestone, dolomite, crushed gravel, sandstone, ACBF, or SF. The surface application aggregate type shall be based on the ESAL category in the Surface Aggregate Table below.*

*** *The fine aggregate for micro-surface shall be limestone, dolomite, crushed gravel, sandstone, ACBF, or SF. The fine aggregate angularity shall be a minimum of 45 in accordance with AASHTO T 304 Method A. The clay content of the blended aggregate material from the fine and coarse aggregates shall meet a minimum sand equivalency of 65 in accordance with AASHTO T 176. The surface leveling application aggregate type shall be based on the ESAL category as follows:*

Surface Aggregate Table			
Coarse or Fine Aggregate Type	*Traffic ESALs*		
	< 3,000,000	*< 10,000,000*	*≥ 10,000,000*
Air-Cooled Blast Furnace Slag	*Yes*	*Yes*	*Yes*
Steel Furnace Slag	*Yes*	*Yes*	*Yes*
Sandstone	*Yes*	*Yes*	*Yes*
Crushed Dolomite	*Yes*	*Yes*	*Note 1*
Polish Resistant Aggregates	*Yes*	*Yes*	*Note 1*
Crushed Stone	*No*	*No*	*No*
Gravel	*No*	*No*	*No*
NOTE 1. Polish resistant aggregate or crushed dolomite may be used when blended with ACBF or sandstone but cannot exceed 50% of the coarse aggregate by weight (mass), or cannot exceed 40% of the coarse aggregate by weight (mass) when blended with SF.			

411.03 Design Mix Formula

The Contractor shall submit a Design Mix Formula, DMF, for the specific materials to be used on the project to the District Testing Engineer 1 week prior to use. The DMF shall state the following (all percentages are based on the dry weight of the aggregate):

(a) source of each individual material
(b) ~~T~~the aggregation gradation shall be in accordance with the following:

Sieve Size	*Surface/Leveling*	*Rut Fill**
3/8 in. (9.5 mm)	*100*	*100*
No. 4 (4.75 mm)	*85-100*	*70-90*
No. 8 (2.36 mm)	*50-80*	*45-70*
No. 16 (1.18 mm)	*40-65*	*28-50*
No. 30 (600 µm)	*25-45*	*19-34*
No. 50 (300 µm)	*13-25*	*12-25*
No. 100 (150 µm)	*7-18*	*7-18*
No. 200 (75 µm)	*5-15*	*5-15*
* *If rut fill course is used as a surface application, the aggregates shall be in accordance with the Surface Aggregate Table above.*		

(c) percentage of aggregate
(d) percentage of mineral filler (minimum and maximum)
(e) percentage of water (minimum and maximum)
(f) percentage of mix set additives (if required)
(g) percentage of polymer modified CSS-1h emulsified asphalt
(h) state the quantitative effects of moisture content on the unit weight of the aggregate
(i) results for the tests in the following:

Characteristic	*Test Method ISSA**	*Requirement*
Wet Cohesion *30 Minutes, Min. (Set Time)* *60 Minutes, Min. (Traffic)*	*TB-139***	 *12 kg-cm* *20 kg-cm*
Wet Stripping, Min.	*TB-114*	*90%*
Wet Track Abrasion Loss *60 Minutes Soak, Max.*	*TB-100*	 *536 g/m^2*
Saturated Abrasion *Compatibility, Max*	*TB-144*	 *3g loss*
Mix Time @ 77°F (25°C)	*TB-113***	*Controllable to 120 s*
Mix Time @ 104°F (40°C)	*TB-113***	*Controllable to 35 s*

* *International Slurry Surfacing Association*
** *The TB-139 (set time) and TB-113 (mix time) tests shall be checked at the highest temperature expected during construction. For the TB-113 test at 104°F (40°C), all ingredients and containers shall be preheated.*

411.04 Equipment

The Contractor shall use self-contained, self-propelled, continuous loading units designed for micro-surfacing. Truck-mounted batch type machines will be allowed on projects with quantities smaller than or equal to 50,000 sq yds. The Contractor shall provide a minimum of 2 truck-mounted units at all times.

411.045 Pre-Paving Coordination

A pre-paving meeting between the Contractor and the Engineer will be held on-site prior to beginning work. The agenda for this meeting will include as a minimum:

(a) the Contractor's detailed work schedule
(b) traffic control plan
(c) calibration of equipment
(d) Design Mix Formula/Job Mix Formula
(e) inspection and evaluation of the condition and adequacy of equipment, including units for transport of materials
(f) Quality Control Plan in accordance with ITM 803

CONSTRUCTION REQUIREMENTS

REVISION TO SPECIAL PROVISIONS

PROPOSED REVISED 411-R-432 WARRANTED MICRO-SURFACING

411.0~~5~~6 Preparation of Surfaces

The Contractor shall be responsible for all surface preparation ~~that may affect the performance of~~ to meet the requirements for the warranted micro-surfacing~~, including, but not limited to compatibility of crack sealing materials when the contract includes crack sealing prior to micro-surfacing~~. All castings and detector housings shall be protected ~~during~~prior to the application of material in accordance with 404.07.

411.0~~6~~7 Opening to Traffic

The micro-surface shall be capable of being opened to traffic within 1 h after application. If the micro-surface is not stable under traffic loading within 1 h of placement, the Contractor shall immediately cease operations. Prior to resuming operations, the Contractor shall notify the Engineer of the cause and the corrective action to be taken.

411.0~~7~~8 Finished Pavement Properties

~~Pavement smoothness shall be in accordance with 401.18 except profilograph requirements will not apply. Smoothness requirements shall not apply to shoulder micro-surface placed separately~~All surface irregularities in excess of 1/8 in. (3 mm) measured with a 3 ft straightedge shall be corrected.

The longitudinal construction joints and lane edges shall coincide with the proposed painted lane lines. Longitudinal joints shall be constructed with less than a 3 in. (75 mm) overlap on adjacent passes and no more than 1/4 in. (6 mm) overlap thickness measured with a 10 ft (3 m) straightedge in accordance with 409.03(f). If applicable, overlapping passes shall be on the uphill side to prevent ponding of water. Construct neat and uniform transverse joints with no more than a 1/8 in. (3 mm) difference in elevation across the joint as measured with a 10 ft (3 m) straightedge. The lane edge shall be neat and uniform with no more than 2 in. (50 mm) of horizontal variance in any 100 ft (30 m).

411.0~~8~~9 Warranty

Upon completion of all warranted micro-surfacing and opening to unrestricted traffic, the warranty bond shall be in effect for a total of 3 years. The warranty bond shall be properly executed by a surety company satisfactory to the Department and be payable to the State of Indiana and submitted with the Contractor's bid.

The warranty bond shall be an amount equal to 100% of the contract total for the warranted ~~micro-surfacing excluding patching or other work included in the contract~~ microsurfacing pay items. The bond is intended to insure completion of required warranty work, including payments for all labor, equipment, materials and closure periods used to remediate any warranted distresses.

REVISION TO SPECIAL PROVISIONS

PROPOSED REVISED 411-R-432 WARRANTED MICRO-SURFACING

Upon the final acceptance of the project, the contractual obligations of the Contractor are satisfied as long as the micro-surfacing continues to meet or exceed the warranted values as defined herein.

All warranty work shall be accomplished in accordance with 411.~~10~~11. At the end of the warranty period, the Contractor will be released from further warranty work or responsibility, provided all previous warranty work has been satisfactorily completed and approved by the Department.

411.~~09~~10 Conflict Resolution Team

The scope of work for the conflict resolution team includes all issues concerning the warranted pavement relative to the quality control plan, material selection, warranted pavement evaluations, distress indicators, remedial action, and remediation plans.

The team will consist of 2 Contractor representatives, 2 Department representatives, and a 5th person mutually agreed upon by both the Department and the Contractor. All costs for the 5th person will be equally shared between the Department and the Contractor.

The team members will be identified in writing when needed and will be knowledgeable in the terms and conditions of this warranty and the methods used in the measurement and calculation of pavement distress. The team will render a final recommendation to the Chief Engineer by a majority vote. Each member has an equal vote.

411.~~10~~11 Warranty Work

During the warranty period, elective/preventive work and remedial work shall be performed at no cost to the Department ~~and shall be based on the results of pavement distress surveys. Remedial work to be performed and materials to be used shall be a decision of the Contractor with approval of the Department~~Elective/preventive work is performed as a result of monitoring of the warranted micro-surfacing by the Contractor. Elective/preventive work shall be the Contractor's option. Remedial work is performed as a result of pavement distress surveys performed by the Department. The scope of all elective/preventive work or remedial work to be performed as well as materials to be used shall be proposed by the Contractor and approved by the Department. Prior to proceeding with any warranty work or monitoring, all necessary permits shall be obtained from the Department.

Remedial/Warranty work initiated by the Contractor during the warranty period will not be assessed a lane closure fee. For Department initiated warranty work, costs for closure periods will be applied using the following closure period rates:

Peak Hour:	*$xxxxxx/lane/hour*
Non – Peak Hour:	*$xxxxxx/lane/hour*

REVISION TO SPECIAL PROVISIONS

PROPOSED REVISED 411-R-432 WARRANTED MICRO-SURFACING

During the warranty period, the Contractor may monitor the warranted micro-surfacing using non-destructive procedures. ~~All proposed remedial actions shall be coordinated with the Department~~.

Coring, milling or other destructive procedures may not be performed by the Contractor, without prior consent of the Department. The Contractor will not be responsible for damages to the pavement as a result of coring, milling or other destructive procedures conducted by the Department.

The Contractor will have the 1st option to perform the remedial work. If, in the opinion of the Engineer, the problem requires immediate attention for safety of the traveling public and the Contractor cannot perform the remedial work within 24 h of notification the Department has the option to have emergency remedial work performed by other forces. The Contractor shall be responsible ~~to pay~~ for all costs incurred by the Department for emergency remedial work. Remedial work performed by other forces will not alter the requirements, responsibilities, or obligations of the warranty.

411.~~11~~12 Pavement Distress Indicators, Thresholds, and Remedial Action

The Department will use the following pavement distress indicators throughout the warranty period:

(a) Rutting – transverse displacement of the micro-surfacing
(b) Delamination – physical separation of the micro-surfacing that exposes the underlying surface ~~within a wheelpath~~
(c) Raveling – wearing away of the micro-surfacing
(d) Skid Resistance – friction number as measured by ASTM E 274 and E 524

The pavement threshold values for the pavement distress indicators will be evaluated for the entire length of the contract for each lane. The threshold values for the pavement distress indicators are listed below:

	~~Single Location~~	~~Multiple Location/mile~~
~~Delamination~~	~~0.5 yd^2~~	~~1.0 yd^2~~
~~Raveling~~	~~0.5 yd^2~~	~~1.0 yd^2~~

~~*Rut Depth .....average 1/4 in. (6 mm)*~~
~~*Friction Number*.....average 35, no value less than 30*~~
~~* Individual friction tests will be done in each lane every 1/2 mi for the length of the contract.~~

REVISION TO SPECIAL PROVISIONS

PROPOSED REVISED 411-R-432 WARRANTED MICRO-SURFACING

Distress	*Single Location*	*Multiple Locations*
Delamination/Raveling	*1/2 sq yd*	*1 sq yd/mi*
Rut Depth	*1/4 in.*	*average 1/4 in./mi*
*Friction Number**	*no less than 30*	*average 35*

* *Individual friction tests will be performed in each lane every 1/2 mi for the length of the contract.*

The Department may evaluate the warranted micro-surfacing during the warranty period. A final condition survey will be made by the Department and the Contractor will be notified in writing of all sections exceeding the warranty threshold at least 90 days in advance of the expiration of the warranty period.

If any of the threshold levels are met or exceeded, the Contractor shall ~~recommend~~propose remedial action and work schedule to the Department. After the proposed remedial action and work schedule is approved, the Contractor shall perform the remedial work within 30 calendar days.

~~*Remedial action shall be taken within 30 calendar days of the date the Contractor is notified that a threshold level has been met or exceeded by the final condition survey. If threshold levels are met or exceeded within the warranty period, the Contractor shall submit for approval his recommended remedial action and work schedule.*~~

If, anytime during the warranty period, 30% or more of the project requires, or has received remedial action, the entire project shall receive a remedial action as determined by the Contractor and the Department. If an impasse develops, the team will make a final recommendation.

If remedial action work or elective/preventive action work performed by the Contractor necessitates a corrective action to the pavement markings, adjacent lanes or roadway shoulders, ~~such corrective action to the pavement markings, adjacent lanes, and shoulders~~the required corrective action shall be the responsibility of the Contractor.

Warranty requirements for all remediation work will be limited to the life of the original contract warranty.

If any of the threshold levels are met or exceeded and the Contractor does not agree to the pavement distress survey or the Department does not agree with the proposed remedial action, the team will provide a recommendation within 30 calendar days.

The Contractor will not be held responsible for distresses that are caused by factors beyond the control of the Contractor. The Contractor shall be responsible for materials and workmanship problems.

REVISION TO SPECIAL PROVISIONS

PROPOSED REVISED 411-R-432 WARRANTED MICRO-SURFACING

~~***411.12 Elective/Preventive Action***~~

~~*Elective or preventive action may be performed by the Contractor with concurrence from the Department.*~~

411.13 Department Maintenance

The Department will perform routine maintenance operations during the warranty period such as plowing, applying de-icing chemicals, repairs to safety appurtenances, pavement markings, mowing and sign maintenance. The Department, during the warranty period, will perform no routine pavement surface maintenance activities.

411.14 Method of Measurement

Micro-Surfacing, Warranted, of the type specified will be measured by the square yard (square meter) of the surface course. The width of the surface course will be the width placed. The length of the surface course will be measured along the centerline of each roadway or ramp.

Only the micro-surface surface course will be measured for payment.

411.15 Basis of Payment

The accepted quantities for this work will be paid for at the contract unit price per square yard (square meter) of micro-surface, warranted, of the type specified, complete in place.

The accepted quantities for micro-surfacing approaches will be paid for at the contract unit price per square yard (square meter) of micro-surface, warranted, for approaches of the type specified, complete in place.

Payment will be made under:

Pay Item	***Pay Unit Symbol***
Micro-Surfacing, Warranted, for Approaches, Multiple Course	*SYS (m2)*
Micro-Surfacing, Warranted, for Approaches, Single Course	*SYS (m2)*
Micro-Surfacing, Warranted, Multiple Course	*SYS (m2)*
Micro-Surfacing, Warranted, Single Course	*SYS (m2)*

The cost of furnishing materials, equipment, labor, ~~maintenance of traffic~~, underlying micro-surface courses, and tack coat for micro-surface, if required, surface preparation, meeting smoothness requirements, and all incidentals shall be included in the cost of micro-surfacing, warranted, of the type specified.

411.16 Final Warranty Acceptance

The Engineer will review the project in the field for any ~~obvious~~ general defects not addressed in the indicators and recommend a Final Warranty Acceptance. The

REVISION TO SPECIAL PROVISIONS

PROPOSED REVISED 411-R-432 WARRANTED MICRO-SURFACING

Division of Construction Management will issue the Contractor a Final Warranty Acceptance letter upon completion of the warranty period and all required remedial work.

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. __
Technical Advisory

May 10, 2011 DRAFT

TO: **All Design, Operations, and District Personnel, and Consultants**

FROM: **Todd Shields**
Manager, Office of Technical Services
Highway Operations Division

SUBJECT: **Microsurface**

REVISES: ***Indiana Design Manual*** **Section 52-11.01**
4. Micro-surfacing

EFFECTIVE: **, 2011, Letting**

Micro-surfacing design guidelines have been revised and is attached.

4. Micro-surfacing. Micro-surfacing is a thin, polymer-modified asphalt emulsion mixture. Micro-surfacing may be used to provide a new wearing course to arrest the oxidation of asphalt pavement, improve friction, or fill ruts. An existing pavement should have no large cracks or excessive surface irregularities such as shoving. Cores should be taken to determine the thickness and investigate if a stripping condition exists. Core data and life-cycle cost data should be reviewed with the Office of Pavement Engineering for specific recommendations.

   All pavement markings and raised pavement markers must be removed prior to placement of a micro-surface. This should be included in the appropriate pavement-marking-removal pay items. Since micro-surfacing is an emulsion based material, it requires time to fully cure. Thermoplastic and preformed tape may not adhere well, so permanent marking materials should be paint or multi-component.

~~Temporary removable markings may not adhere well to a microsurface. Therefore, temporary paint should be included as a pay item.~~

If a pavement cross section has irregularities that will require a leveling course, or ruts greater than 0.25 in. that will require a rut fill course, a multiple course micro-surface should be specified. Otherwise, a single course micro-surface may be specified.

The designer should identify any existing surface irregularities, including bumps, in the plans that need to be addressed and should be included in the cost of other items.

If public road or other approaches require micro-surfacing, those areas should be included as separate pay items (i.e. Micro-surfacing for Approaches).

Since the type of aggregate used in micro-surfacing is dependent on ESAL's, mainline ESAL's need to be shown on the traffic data block on the title page of the plans.

Tack should not be included as a separate pay item for micro-surface. Contractors may elect to use tack to meet the warranty requirements, but it is at their expense. Tack should be included for other HMA work only, such as patching.

The Warranted UBWC spec requires a Lane rental cost be included. Section 81-3 of the Indiana Design Manual provides guidance on obtaining lane rental costs. Figure 81-3D Part B includes the calculations which can be used to determine the peak hour and off-peak hour lane rental rates.

a. AADT. Micro-surface may be used without regard to traffic volume.

b. Pavement Distresses. A micro-surface may be used on a road with low severity surface cracks. Cracks will typically reflect through the micro-surface in a short time period. Cracks should be sealed prior to the application of a micro-surface. Cracks wider than ¼ in. may need to be routed prior to sealing.

c. Rutting. Micro-surface may be used to correct rutting.

d. Roughness. The IRI should be 130 or less. The pavement should not have severe distresses indicative of a pavement nearing the end of its life. Micro-surfacing will not significantly improve surface roughness.

e. Friction. A pavement with a low FN should be considered for a micro-surface treatment. A micro-surface will restore surface friction.

f. Surface Aging. A micro-surface may be used to stop future deterioration of an asphalt pavement due to age hardening, oxidation, or minor raveling.

Each micro-surfacing project should be reviewed and approved by the Pavement Steering Committee. A life-cycle cost analysis in accordance with Section 52-12.0 should be completed.

COMMENTS AND ACTION

411-R-432 WARRANTED MICRO-SURFACING

Motion: Second: Ayes: Nays:	Action: ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
Standard Specifications Sections affected: NONE Recurring Special Provision affected: 411-R-432 WARRANTED MICRO-SURFACING Standard Sheets affected: Section 52-11.01 Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	____ 20__ Standard Specifications Book ____ Revise Pay Items List ____ Create RSP (No.____) Effective ____Letting RSP Sunset Date: ____ ____ Revise RSP (No.____) Effective ____Letting RSP Sunset Date: ____ Standard Drawing Effective ____ ____ Create RPD (No. ____) Effective ____Letting ____ Technical Advisory GIFE Update Req'd.? Y ___ N ___ By ____ Addition or ____ Revision Frequency Manual Update Req'd? Y___N___ By ____ Addition or ____ Revision Received FHWA Approval? ____

Mr. Boruff
Date: 11/16/11

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS
REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: At some light pole installations the anchor rod washers at the transformer bases are failing due to insufficient thickness and diameter. These dimensions are not currently given in the standards. As a result washers that are sized for other applications are incorrectly being used..

PROPOSED SOLUTION: Manufacturers recommend a 1/2" thick, 1-1/16" inner diameter and 2-3/4" outer diameter washer for transformer base applications. We propose a revision to the standard drawing 807-LTST-02 for "Aluminum Light Pole With Transformer Base" to specify the recommended dimensions.

APPLICABLE STANDARD SPECIFICATIONS: N/A

APPLICABLE STANDARD DRAWINGS: 807-LTST-02

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED: N/A

Submitted By: David Boruff

Title: Supervisor Traffic Administration section

Organization: INDOT

Phone Number: 317-234-7975

Date: 10/12/11

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc review by Industry, INDOT Production Division, District Highway Maintenance.

REVISION TO STANDARD DRAWINGS

REVISED 807-LTST-02 ALUMINUM LIGHT POLE WITH TRANSFORMER BASE (DRAFT)

FOR ROADWAY INSTALLATION (TRANSFORMER BASE)					
E.M.H. (FT.)	ARM LENGTH (FT.)	SHAFT			BASE PLATE
		BASE DIAMETER (IN.)	TOP DIAMETER (IN.)	THICKNESS (IN.)	BOLT CIRCLE (IN.)
25	5	8	4.5	0.188	11 ½"
25	10	8	6	0.188	11 ½"
25	15	8	6	0.188	11 ½"
25	20	10	6	0.188	14 ½"
25	25	10	6	0.250	14 ½"
30	5	8	4.5	0.188	11 ½"
30	10	8	6	0.188	11 ½"
30	15	8	6	0.188	11 ½"
30	20	10	6	0.188	14 ½"
30	25	10	6	0.250	14 ½"
35	5	8	4.5	0.188	11 ½"
35	10	8	6	0.188	11 ½"
35	15	8	6	0.188	11 ½"
35	20	10	6	0.188	14 ½"
35	25	10	6	0.250	14 ½"
40	5	8	6	0.188	11 ½"
40	10	8	6	0.188	11 ½"
40	15	8	6	0.219	11 ½"
40	20	10	6	0.219	14 ½"
40	25	10	6	0.312	14 ½"
45	5	8	6	0.219	11 ½"
45	10	8	6	0.219	11 ½"
45	15	8	6	0.219	11 ½"
45	20	10	6	0.250	14 ½"
45	25	10	6	0.312	14 ½"

FOR BRIDGE DECK INSTALLATION (ANCHOR BASE)					
E.M.H. (FT.)	ARM LENGTH (FT.)	SHAFT			BASE PLATE
		BASE DIAMETER (IN.)	TOP DIAMETER (IN.)	THICKNESS (IN.)	BOLT CIRCLE (IN.)
25	5	8	4.5	0.188	11 ½"
25	5	8	6	0.188	11 ½"
30	5	8	4.5	0.188	11 ½"
30	5	8	6	0.188	11 ½"
35	5	8	4.5	0.188	11 ½"
35	5	8	6	0.188	11 ½"
40	5	8	6	0.188	11 ½"
40	5	8	6	0.219	11 ½"
45	5	8	6	0.219	11 ½"
45	5	8	6	0.250	11 ½"

GENERAL NOTES

1. The anchor bolt for roadway installation shall have a diameter of 1", a total length of 52", and a hook length of 4".
2. The washer with anchor bolt for roadway installation (Transformer Base) shall be galvanized flat washer 1 1/16" I.D. x 2 3/4" O.D. x 1/2" thick.
3. The anchor bolt for bridge deck installation shall have a diameter of 1", a total length of 44", and a hook length of 4".
4. Arm shall be truss type on bridge deck installation.

INDIANA DEPARTMENT OF TRANSPORTATION

ALUMINUM LIGHT POLE
WITH TRANSFORMER BASE

STANDARD DRAWING NO. E 807-LTST-02

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

BACKUP 01 EXISTING 807-LTST-02 ALUMINUM LIGHT POLE WITH TRANSFORMER BASE

FOR ROADWAY INSTALLATION (TRANSFORMER BASE)

E.M.H. (FT.)	ARM LENGTH (FT.)	SHAFT			BASE PLATE
		BASE DIAMETER (IN.)	TOP DIAMETER (IN.)	THICKNESS (IN.)	BOLT CIRCLE (IN.)
25	5	8	4.5	0.188	11½
25	10	8	6	0.188	11½
25	15	8	6	0.188	11½
25	20	10	6	0.188	14½
25	25	10	6	0.250	14½
30	5	8	4.5	0.188	11½
30	10	8	6	0.188	11½
30	15	8	6	0.188	11½
30	20	10	6	0.188	14½
30	25	10	6	0.250	14½
35	5	8	4.5	0.188	11½
35	10	8	6	0.188	11½
35	15	8	6	0.188	11½
35	20	10	6	0.188	14½
35	25	10	6	0.250	14½
40	5	8	6	0.188	11½
40	10	8	6	0.188	11½
40	15	8	6	0.219	11½
40	20	10	6	0.219	14½
40	25	10	6	0.312	14½
45	5	8	6	0.219	11½
45	10	8	6	0.219	11½
45	15	8	6	0.219	11½
45	20	10	6	0.250	14½
45	25	10	6	0.312	14½

FOR BRIDGE DECK INSTALLATION (ANCHOR BASE)

E.M.H. (FT.)	ARM LENGTH (FT.)	SHAFT			BASE PLATE
		BASE DIAMETER (IN.)	TOP DIAMETER (IN.)	THICKNESS (IN.)	BOLT CIRCLE (IN.)
25	5	8	4.5	0.188	11 1/2
25	5	8	6	0.188	11 1/2
30	5	8	4.5	0.188	11 1/2
30	5	8	6	0.188	11 1/2
35	5	8	4.5	0.188	11 1/2
35	5	8	6	0.188	11 1/2
40	5	8	6	0.188	11 1/2
40	5	8	6	0.219	11 1/2
45	5	8	6	0.219	11 1/2
45	5	8	8	0.250	11 1/2

NOTES:

1. The anchor bolt for roadway installation shall have a diameter of 1", a total length of 52", and a hook length of 4".
2. The anchor bolt for bridge deck installation shall have a diameter of 1", a total length of 44" and a hook length of 4".
3. Arm shall be truss type on bridge deck installation.

INDIANA DEPARTMENT OF TRANSPORTATION

ALUMINUM LIGHT POLE WITH TRANSFORMER BASE

SEPTEMBER 2002

STANDARD DRAWING NO. E 807-LTST-02

RICHARD L. VONCANNON REGISTERED No. 9750 STATE OF Indiana PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

/s/ Richard L VonCannon 9-03-02
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Snyder 9-03-02
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

BACKUP 02 IMAGES NO. 01 THROUGH 04 FROM VARIOUS WORKSITES

No. 01

No. 02

No. 03

No.04

COMMENTS AND ACTION

807-LTST-02 ALUMINUM LIGHT POLE WITH TRANSFORMER BASE

Motion:
Second:
Ayes:
Nays:

Action:
____ Passed as Submitted
____ Passed as Revised
____ Withdrawn

Standard Specifications Sections affected:

NONE

Recurring Special Provision affected:

NONE

Standard Sheets affected:

807-LTST-02 ALUMINUM LIGHT POLE WITH TRANSFORMER BASE

Design Manual Sections affected:

NONE

GIFE Sections cross-references:

NONE

____ 20__ Standard Specifications Book
____ Revise Pay Items List

____ Create RSP (No.____)
Effective ____Letting
RSP Sunset Date: ____

____ Revise RSP (No.____)
Effective ____Letting
RSP Sunset Date: ____

Standard Drawing Effective ____
____ Create RPD (No. ____)
Effective ____Letting
____ Technical Advisory

GIFE Update Req'd.? Y ___ N ___
By ____ Addition or ____ Revision

Frequency Manual Update Req'd? Y___N___
By ____ Addition or ____ Revision

Received FHWA Approval? ____

Mr. Strain
Date: 11/16/11

SPECIFICATION REVISIONS

REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The Department has developed wide flange bulb tee beams for use in bridge construction. The standard bulb tee elastomeric bearings can not be used for these beam types. The designer was designing a unique bearing for each design.

PROPOSED SOLUTION: A Standard is needed for the wide flange bulb tee beams. These elastomeric bearing pads are designed specifically for the wide flange bulb tee beams.

APPLICABLE STANDARD SPECIFICATIONS: 707, 726, 915.04, and 915.05

APPLICABLE STANDARD DRAWINGS: E726-BEBP-03, 04, 05

APPLICABLE DESIGN MANUAL SECTION: Chapter 406

APPLICABLE SECTION OF GIFE: N.A.

APPLICABLE RECURRING SPECIAL PROVISIONS: N.A.

PAY ITEMS AFFECTED: None

Submitted By: Randy Strain

Title: Bridge Standard Engineer

Organization: INDOT

Phone Number: 317-232-3339

Date: 10-18-11

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

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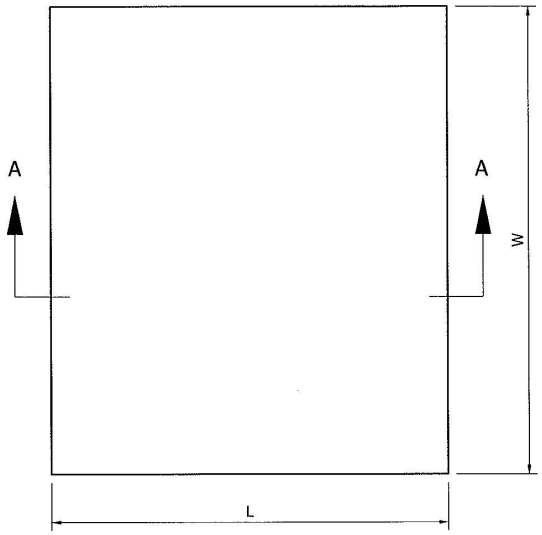
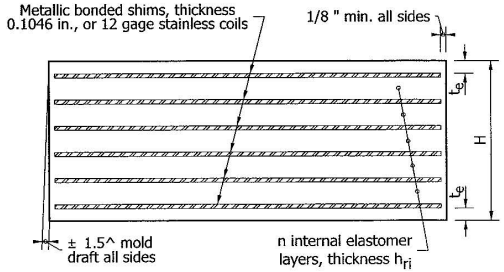
REVISION TO STANDARD DRAWINGS

PROPOSED NEW 726-BEBP-03 BRIDGE ELASTOMERIC BEARING PADS TYPE TH1-TH4 FOR PRESTRESSED WIDE-FLANGE BULB-TEE BEAMS



ELASTOMERIC BEARING PAD
PLAN



SECTION A - A

NOTES:

1. The rectangular Elastomeric Bearing Pad shall be placed with L dimension parallel to longitudinal bridge axis.
2. h_{rt} is defined as the summation of all internal elastomer thickness plus the two external layers thickness.
3. The Contractor shall check that the bearing seat is level. Grinding may be required to obtain a level seat.
4. The bridge seat shall be finished level at the time concrete is placed. Finished concrete shall be ground if necessary to ensure full and level contact between the seat and the bearing pads when the beams are set.

TABLE OF DIMENSIONS

Bearing Designation	Bearing Width W	Bearing Length L	Internal Elastomer Thickness h_{ri}	Number of Internal Elastomer Layers n	External Elastomer Thickness t_e	h_{rt}	Number of Steel Shims n_s	Bearing Total Thickness H
TH1	36"	12"	1/2"	5	9/32"	3 1/16"	6	3 11/16"
TH2	36"	14"	1/2"	6	9/32"	3 9/16"	7	4 5/16"
TH3	36"	17"	19/32"	7	5/16"	4 25/32"	8	5 5/8"
TH4	36"	19"	19/32"	8	5/16"	5 3/8"	9	6 5/16"

INDIANA DEPARTMENT OF TRANSPORTATION

BRIDGE ELASTOMERIC BEARING PADS
TYPE TH1 - TH4 FOR PRESTRESSED
WIDE-FLANGE BULB-TEE BEAMS

NOVEMBER 2011

STANDARD DRAWING NO. E 726-BEBP-03

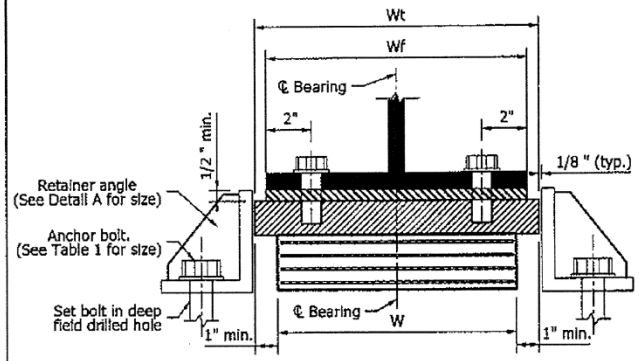
DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

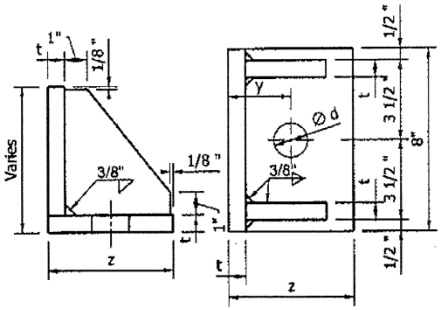
DESIGN STANDARDS ENGINEER

REVISION TO STANDARD DRAWINGS

REVISION TO 726-BEBP-0~~3~~4 BRIDGE ELASTOMERIC BEARING PADS TYPE S - FOR STEEL BEAMS



CROSS SECTION THROUGH ASSEMBLY



DETAIL A ③

NOTES:

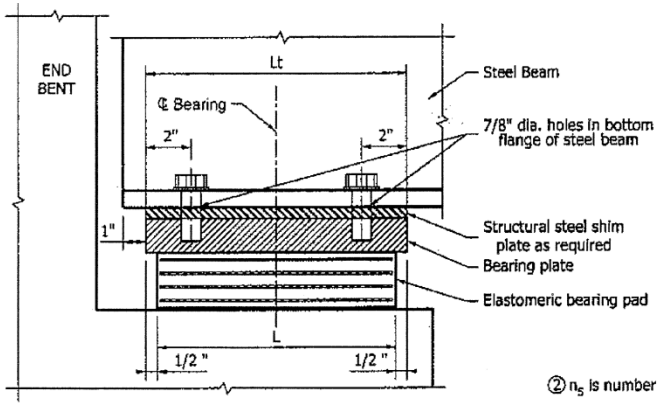
1. The bearing plate size shall be calculated as follows:
   Lt = L + 1" Wt = Wf + 2" or Wt = W + 2" whichever is greater.
② The shim thickness is 0.1046 in., which corresponds to 12 gage stainless coils.
③ Equivalent rolled angle shape with stiffeners may be used in lieu of welded plates.
④ Minimum dimension required is 1 1/2 " + flange thickness + 1/3" (for shim plate).
⑤ Minimum thickness 1 1/2" -05
6. See standard drawing E-726-BEBP-~~X~~ for Table of Dimensions.

TABLE 1

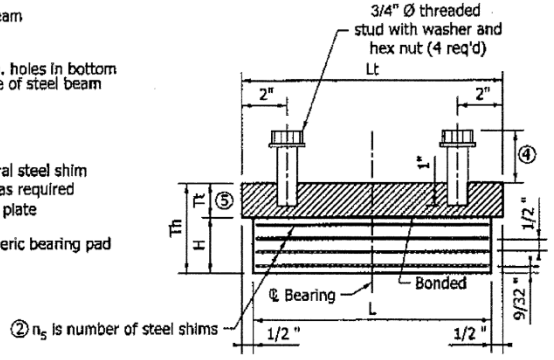
ANCHOR BOLT SIZE		
BEARING SIZE		BOLT SIZE
S1	11" x 8"	1" x 12"
S2	12" x 9"	1" x 12"
S3	13" x 10"	1" x 12"
S4	15" x 11"	1 1/4" x 15"
S5	16" x 12"	1 1/4" x 15"
S6	20" x 13"	1 1/2" x 18"
S7	20" x 15"	1 1/2" x 18"

TABLE 2

BOLT DIA.	y	z	t	d
1"	2 1/8"	4"	1/2"	1 1/8"
1 1/4"	2 1/4"	4 3/4"	1/2"	1 3/8"
1 1/2"	2 3/4"	5 1/2"	3/4"	1 5/8"



LONGITUDINAL SECTION THROUGH ASSEMBLY



BEARING ASSEMBLY

INDIANA DEPARTMENT OF TRANSPORTATION

BRIDGE ELASTOMERIC BEARING PADS
TYPE S - FOR STEEL BEAMS

SEPTEMBER 2009 -04

STANDARD DRAWING NO. E 726-BEBP-~~X~~

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

DESIGN STANDARDS ENGINEER

/s/ Richard L.VanCleave 09/01/09
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/09
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

REVISION TO 726-BEBP-045 ELASTOMERIC BEARING PADS TYPE S

TABLE OF DIMENSIONS - TYPE S BEARINGS FOR STEEL BEAMS

Bearing Designation	Bearing Width W	Bearing Length L	Number of Internal Elastomer Layers n	h_{rt} ①	Number of Steel Shims n_s	Bearing Total Thickness H
S1-A	11"	8"	2	1 9/16"	3	1 27/32"
S1-B	11"	8"	3	2 1/16"	4	2 7/16"
S2-A	12"	9"	2	1 9/16"	3	1 27/32"
S2-B	12"	9"	3	2 1/16"	4	2 7/16"
S3-A	13"	10"	3	2 1/16"	4	2 7/16"
S3-B	13"	10"	4	2 9/16"	5	3 1/32"
S4-A	15"	11"	4	2 9/16"	5	3 1/32"
S4-B	15"	11"	5	3 1/16"	6	3 5/8"
S5-A	16"	12"	4	2 9/16"	5	3 1/32"
S5-B	16"	12"	5	3 1/16"	6	3 5/8"
S6-A	20"	13"	5	3 1/16"	6	3 5/8"
S6-B	20"	13"	6	3 9/16"	7	4 7/32"
S7-A	20"	15"	6	3 9/16"	7	4 7/32"
S7-B	20"	15"	7	4 1/16"	8	4 13/16"

NOTES:

① h_{rt} is defined as the summation of all internal elastomer thicknesses plus the external elastomer thicknesses.

2. See Standard Drawing E 726-BEBP-~~04~~ -05 for Type S bearing assembly details.

INDIANA DEPARTMENT OF TRANSPORTATION

ELASTOMERIC BEARING PADS
TYPE S

SEPTEMBER 2009 -05

STANDARD DRAWING NO. E 726-BEBP-~~04~~

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

DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 09/01/09
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/09
CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

REVISION TO 726-BEBP-04~~4~~5 ELASTOMERIC BEARING PADS TYPE S

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Mr. Strain
Date: 11/16/11

COMMENTS AND ACTION

726-BEBP-03 BRIDGE ELASTOMERIC BEARING PADS TYPE TH1-TH4 FOR PRESTRESSED WIDE-FLANGE BULB-TEE BEAMS
726-BEBP-0~~3~~*4* BRIDGE ELASTOMERIC BEARING PADS TYPE S – FOR STEEL BEAMS
726-BEBP-0~~4~~*5* ELASTOMERIC BEARING PADS TYPE S

Motion:
Second:
Ayes:
Nays:

Action:
____ Passed as Submitted
____ Passed as Revised
____ Withdrawn

Standard Specifications Sections references:

707 pg 538, 539 and 541;
726 pg 670; 915.04 pg 940;
915.05 pg 945.

Recurring Special Provision affected:

NONE

Standard Sheets affected:

726-BEBP-03, 04, 05

Design Manual Sections affected:

Section 406

GIFE Sections cross-references:

NONE

____ 20__ Standard Specifications Book
____ Revise Pay Items List

____ Create RSP (No.____)
Effective ____Letting
RSP Sunset Date: ____

____ Revise RSP (No.____)
Effective ____Letting
RSP Sunset Date: ____

Standard Drawing Effective ____
____ Create RPD (No. ____)
Effective ____Letting
____ Technical Advisory

GIFE Update Req'd.? Y ___ N ___
By _____ Addition or _____ Revision

Frequency Manual Update Req'd? Y__N__
By _____ Addition or _____ Revision

Received FHWA Approval? _____