INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING AGENDA

Driving Indiana's Economic Growth

June 1, 2006

MEMORANDUM

TO: Standards Committee

FROM: Dannie L. Smith, Secretary

RE: Agenda for the June 22, 2006 Standards Committee Meeting

A Standards Committee meeting is scheduled for 9:00 a.m. on June 22, 2006 in the N955 Bay Window Conference Room. The following agenda items are listed for consideration.

Old Business

Item 11-2 305.03	Mr. Kuchler New PCC Base	6/22/06 300-8	3
Item 11-3 305.05	Mr. Kuchler Widening with PCC Base	6/22/06 300-10	4
Item 11-9 605.04(c)	Mr. Kuchler Proportioning and Placing	6/22/06 600-21	5
Item 11-12 715.12	Mr. Kuchler Pavement Replacement	6/22/06 700-112	6
Item 11-14 801.11	Mr. Kuchler Temporary Crossovers	6/22/06 800-11	7
Item 11-16 805.08	Mr. Kuchler Controller Cabinet, Signal Service, and Detector Housing Installation	6/22/06 800-40	8
Item 12-4 Standard Drawings	Mr. Wright AASHTO Type II, III, or IV I-Beams Indiana 54″ Bulb-Tees Indiana Bulb Tees Greater Than 54″ in Depth	6/22/06	9

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707.03	General Requirements	700-58	
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711.02	Materials	700-72	
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Item 12-8	Mr. Wright	6/22/06	23
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New Business

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506.05	Trial Batch	500-39	
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729	*PATCHING NON-DECK AREAS OF BRIDGE STRUCTURES*	700-158	
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908.02	Corrugated Steel Pipe and Pipe Arches	900-49	
Item 13-5	Mr. Wright	6/22/06	37
910.02(a)	Structural Steel	900-72	

cc: Committee Members (7)
Districts (36)
FHWA (4)
ICI Representative (1)
IMAA Representative (1)
APAI Representative (1)
ACEC Representative (1)
ADS Representative (1)
Mirich Representative
ACPA Representative (1)
Contech Representative (1)
IKO Representative (1)
Bridgetek Representative (1)
INDOT Toll Road (3)
Traffic Design (3)
Estimators (3)
Specification Writers (4)

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 305, BEGIN LINE 19, INSERT AS FOLLOWS:

305.03 New PCC Base

Construction of new PCC bases shall be in accordance with 502, except for 502.14, 502.20, *and the following. A CMDS shall be submitted to the Engineer for approval and is not required to be submitted to the DMTE. Utilization of the Department provided spreadsheet is not required*.

The surface shall be finished with wet burlap or by wood floats. Smoothness of the base will be controlled with a 16 ft (4.9 m) long straightedge longitudinally and a 10 ft (3 m) long straightedge transversely.

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 305, BEGIN LINE 119, DELETE AND INSERT AS FOLLOWS:

Materials and construction requirements shall be in accordance with the applicable requirements of 502, except the following~~.~~*:*

(a) coarse aggregate shall be Class A or higher;

(b) joints shall be sawed in one pass and not sealed. Transverse joints constructed in the widening shall be aligned with existing transverse joints or cracks;

(c) tining is not required;

(d) shoulder corrugations are not required; ~~and~~

(e) pavement smoothness shall be controlled by a 16 ft (4.9 m) straightedge~~.~~*; and*

(f) a CMDS shall be submitted to the Engineer for approval and is not required to be submitted to the DMTE. Utilization of the Department provided spreadsheet is not required.

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 605, BEGIN LNE 61, DELETE AND INSERT AS FOLLOWS:

(c) Proportioning and Placing

Concrete shall be proportioned, mixed, and placed in accordance with 502, *except a CMDS shall be submitted to the Engineer for approval and is not required to be submitted to the DMTE. Utilization of the Department provided spreadsheet is not required*. Where integral curb and gutter is specified, that portion of the curb below the upper surface elevation of the adjoining pavement shall be constructed by extending the pavement to the outer vertical plane of the curb at the time the pavement is placed. The concrete used in this extension shall be the same composition as that of the pavement.

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

Item No. 11-12
Mr. Kuchler
Date: 6/22/06

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 715, BEGIN LINE 362, INSERT AS FOLLOWS:

The pavement replacement areas in Portland Cement Concrete pavements shall be filled with PCCP in accordance with 502, *except a CMDS shall be submitted to the Engineer for approval and is not required to be submitted to the DMTE. Utilization of the Department provided spreadsheet is not required.*

Other sections containing specific cross references:

None

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Recurring Special Provisions potentially affected:

None

Standard Sheets potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 801, BEGIN LINE 500, INSERT AS FOLLOWS:

Temporary crossovers shall be either type A or type B as shown on the plans and shall be constructed in accordance with the applicable sections of 207, 402 or 502. *If applicable, a CMDS shall be submitted to the Engineer for approval and is not required to be submitted to the DMTE. Utilization of the Department provided spreadsheet is not required.* When required to maintain median drainage, a 15 in. (375 mm) diameter pipe shall be placed at the centerline of the median under the crossover. If the crossover is to remain in place for future construction, the pipe shall have appropriate grated box ends in accordance with 715.

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 805, BEGIN LINE 252, DELETE AND INSERT AS FOLLOWS:

A minimum of 12 in. (300 mm) and a maximum of 18 in. (450 mm) of loop wire duct will be permitted in the detector housing for each loop lead. Concrete used in the installation of detector housings shall be in accordance with 506, except *506.05 will not apply and a CMDS shall be submitted to the Engineer for approval and is not required to be submitted to the DMTE. Utilization of the Department provided spreadsheet is not required.* ~~where~~ *Where* a portion of the road is closed or where there is no vehicular traffic, then class A concrete in accordance with 702 may be used. The concrete shall be placed flush with existing surface and shall be covered with a steel plate during the setting time.

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

Item No. 12-4
Mr. Wright
Date: 6/22/06

STANDARD DRAWINGS

707-SDPC-01, AASHTO Type II, III, or IV I-Beams
707-SDPC-02, Indiana 54” Bulb-Tees
707-SDPC-03, Indiana Bulb Tees Greater Than 54” in Depth

Other sections containing specific cross references:

None

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Recurring Special Provisions potentially affected:

707-B-085

Standard Sheets potentially affected:

See Above

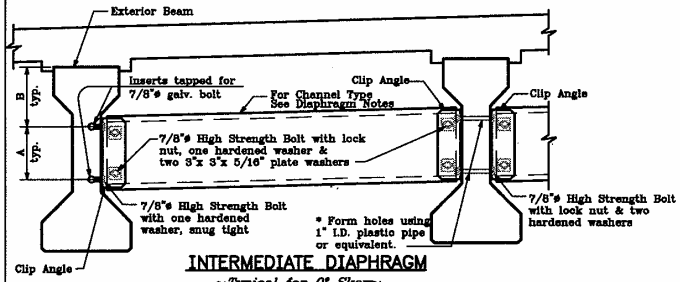
Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

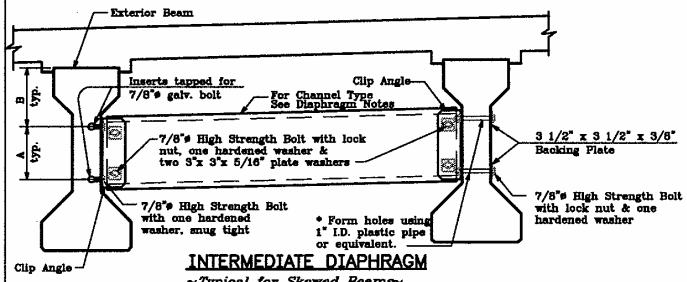
INTERMEDIATE STEEL DIAPHRAGMS



INTERMEDIATE DIAPHRAGM

~Typical for 0° Skew~

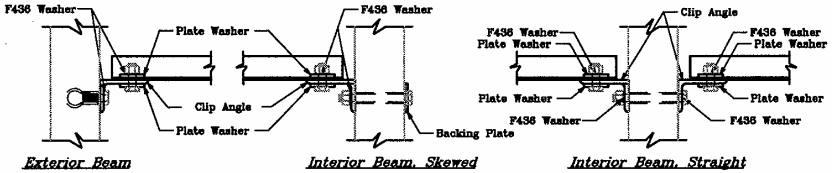
* High Strength Bolt option shown. Inserts may be substituted.



INTERMEDIATE DIAPHRAGM

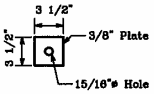
~Typical for Skewed Beams~

* High Strength Bolt option shown. Inserts may be substituted.



Exterior Beam *Interior Beam, Skewed* *Interior Beam, Straight*

CONNECTION DETAILS



BACKING PLATE

Skewed Spans, Only

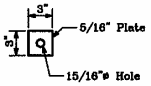
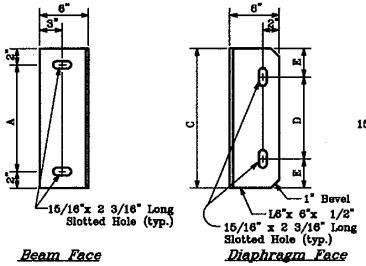
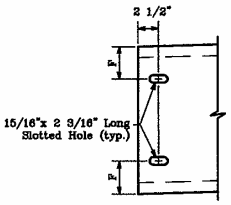


PLATE WASHER



Beam Face *Diaphragm Face*

CLIP ANGLE

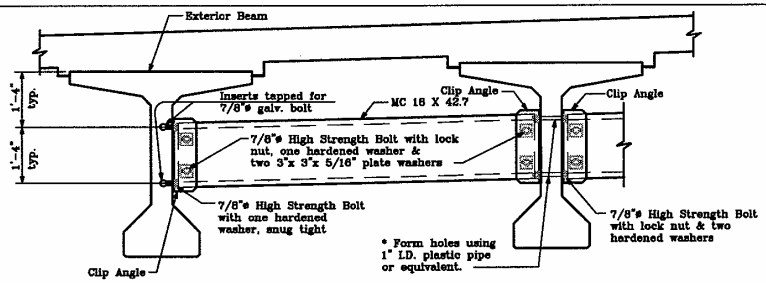


CHANNEL END

Diaphragm Notes							
Beam Type	Dimension						Channel Type
	A	B	C	D	E	F	
AASHTO Type II	9"	1'-0"	1'-1"	6"	3 1/2"	3"	C 12 x 20.7
AASHTO Type III	1'-1"	1'-2 1/2"	1'-5"	10"	3 1/2"	4"	MC 18 x 42.7
AASHTO Type IV	1'-4"	1'-5 1/2"	1'-8"	10"	5"	4"	MC 18 x 42.7

AASHTO TYPE II I-BEAMS
AASHTO TYPE III I-BEAMS
AASHTO TYPE IV I-BEAMS

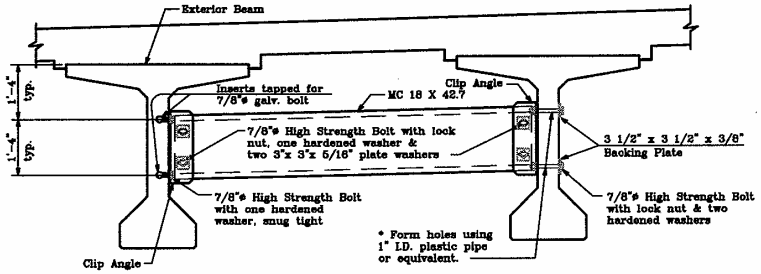
INTERMEDIATE STEEL DIAPHRAGMS



INTERMEDIATE DIAPHRAGM

~Typical for 0° Skew~

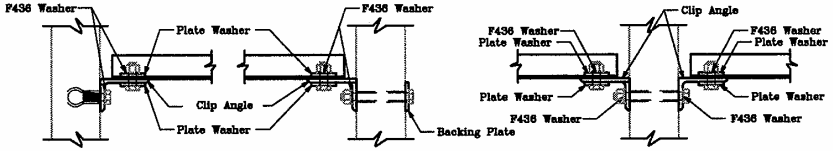
* High Strength Bolt option shown, Inserts may be substituted.



INTERMEDIATE DIAPHRAGM

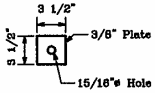
~Typical for Skewed Beams~

* High Strength Bolt option shown, Inserts may be substituted.



Exterior Beam *Interior Beam, Skewed* *Interior Beam, Straight*

CONNECTION DETAILS



BACKING PLATE

Skewed Spans, Only

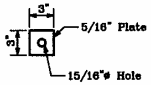
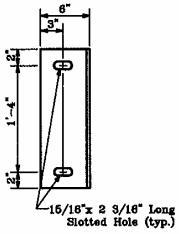
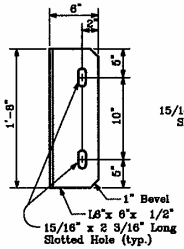


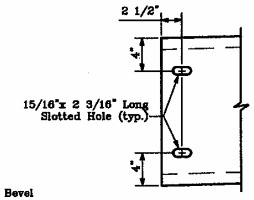
PLATE WASHER



Beam Face



Diaphragm Face

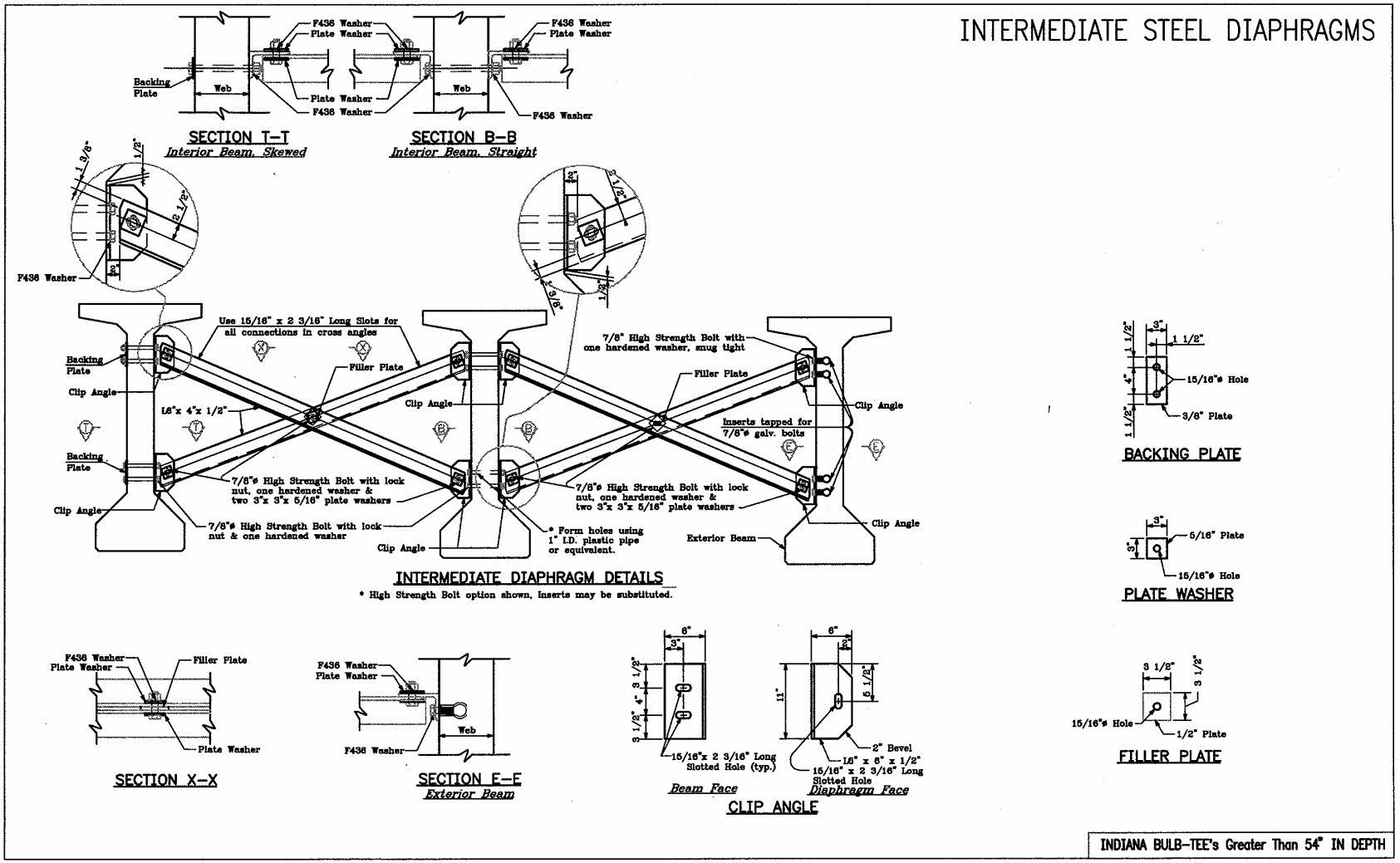


CHANNEL END

CLIP ANGLE

INDIANA 54" BULB-TEES

INTERMEDIATE STEEL DIAPHRAGMS



INDIANA BULB-TEE's Greater Than 54" IN DEPTH

INDIANA DEPARTMENT OF TRANSPORTATION

Indianapolis, Indiana 46204-2249

INTER-DEPARTMENT COMMUNICATION

September 14, 2005

MEMORANDUM:

To: Robert Cales

Attention: Dan Smith

From; John Jordan JEJ
Anne Rearick ARR
Tom Seeman THS
Niranjan Shah NBS
John Wright JW

In recent past Division of Design has received several requests to replace concrete diaphragms with steel diaphragms for prestressed concrete beam structures.

ASCE-INDOT Structural Subcommittee has considered and approved the use of the steel diaphragms. We have also attached a letter from Mr. Greg Kisinski, Design/Build Project Manager and an e-mail from Mr. Derek Merida, contractor on I-465 and 71st and 86th Street project, explaining need and benefits of such diaphragms.

Division of Design desires to create a set of standard drawings and special provisions for the use of steel interior diaphragms for concrete beam structures.

Attached is a CD containing drawings provided by Mr. Mike McCool of Beam, Longest and Neff, Consulting Engineers.

Please do not hesitate to contact Mr. Shah if you need further information.

Thank you.

INDIANA DEPARTMENT OF TRANSPORTATION
Contracts & Construction Division
Special Projects Section
100 North Senate Avenue
Room N601
Indianapolis, Indiana 46204-2216
(317) 233-3699 *FAX: (317) 233-4929*
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Joseph E. Kernan, Governor
J. BRYAN NICOL, Commissioner

Writer's Direct Line
317-234-1534

August 25, 2004

Mr. Niru Shah,

Last winter a design/build contractor requested the opinion of the structural committee on the use of steel cross frames in place of the standard concrete diaphragms that are traditionally used in the State of Indiana. The opinion was offered that the steel cross frames could be used in our case.

From a constructability point of view, the use of the galvanized steel cross frames offered a number of advantages over concrete diaphragms.

Time Savings:

Due to the fact that concrete diaphragms must be cast in place, many hours of labor are spent forming each one. This must be accomplished after the beams are set but before the decking forms or the deck reinforcement can be placed at the location of the diaphragm. This includes time for three separate operations, form, pour and strip forms. This adds days to the time it takes to construct each bridge depending on the number of diaphragms in the structure.

Steel cross frames are placed while the beams are being set adding very little if any time to the beam setting operation. This actually aids in setting the beams by helping to set the proper beam spacing. It also provides instant beam stability.

Safety:

Although I do not know of any injuries directly due the construction of concrete diaphragms, there is inherent danger in their construction due to working many hours in between the beams over the ground, traffic or water.

Much less time is spent in the position while installing steel cross frames.

When working over an open roadway, each line of concrete diaphragms requires a minimum of three lane closures. Over Interstates such as the Borman Expressway, this must me done a night due to lane closure policies. A lane must be taken (two if a center lane) for each operation, form, pour and stripping forms. Each lane closure adds expense, causes delays to traffic and adds increased potential for crashes in the backups.

Since steel diaphragms are set along with the beams, there are not additional lane closures required.

Cost Savings:

Due to the fact that these were used on a design/build contract, I can not say exactly what the direct cost savings were by using steel cross frames. However, the contractor estimated that he saved approximately $1000 per diaphragm location. This contract had three bridges with 16 diaphragm locations per bridge. In addition, there were savings due to not having to set up multiple lane closures. There were savings due to a shorter construction time on each bridge. There was savings to the road user by eliminating some traffic delays.

Greg Kicinski, Design/Build Project Manager

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 707, AFTER LINE 22, INSERT AS FOLLOWS:

Structural steel for steel intermediate diaphragms shall be in accordance with 910.02(a) and shall be galvanized in accordance with ASTM A 123 after cutting, bending, and welding. Bolts for steel intermediate diaphragms shall be 7/8 in. (22 mm) and in accordance with 910.02(e)1, except they shall be type 1. All bolts, nuts, washers, and similar threaded fasteners shall be galvanized in accordance with ASTM A 123 or may be mechanically zinc coated in accordance with ASTM B 695, class 50.

SECTION 707, AFTER LINE 29, INSERT AS FOLLOWS:

Structural steel diaphragms shall be fabricated and erected in accordance with 711. Steel diaphragms shall include all connection angles, plates, and associated hardware required for a complete installation. The Contractor shall replace, re-galvanize, or repair all damaged galvanized material at the discretion of the Engineer.

SECTION 707, BEGIN LINE 333, INSERT AS FOLLOWS:

707.11 Method of Measurement

Precast or prestressed concrete structural members will be measured by the linear foot (meter) along the top of each member or by the square foot (square meter) of top surface of each member. Railing will be measured in accordance with 706.05 if specified as a pay item. *Structural steel for intermediate diaphragms will not be measured.*

SECTION 707, AFTER LINE 367, INSERT AS FOLLOWS:

The cost of all materials, including galvanizing, labor, and equipment for furnishing and installing steel intermediate diaphragms shall be included in the cost of structural member, concrete of the type and size specified.

Other sections containing specific cross references:

707.03
707.10 Pg 700-64

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

See Item 12-4

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

INDIANA DEPARTMENT OF TRANSPORTATION

INTER-DEPARTMENT COMMUNICATION

Standards Section – Room N642

Writer's Direct Line
232-6775

May 24, 2006 DRAFT

DESIGN MEMORANDUM No. 06-__
TECHNICAL ADVISORY

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

FROM: **_____**
Anthony L. Uremovich
Design Policy Engineer
Contracts and Construction Division

SUBJECT: **Interior Diaphragms with Prestressed-Concrete Members**

REVISES: ***Indiana Design Manual* Section 63-7.02**

EFFECTIVE: **_____, 2006, Letting**

I. Structural-Steel Interior Diaphragms

Structural-steel interior diaphragms should be specified if interior diaphragms are required for a prestressed-concrete-members bridge. This use of structural steel instead of concrete does not affect the bridge design. Structural-steel interior diaphragms should be detailed on the plans. Steel interior diaphragms are not a separate pay item. Their cost should be included in that of the concrete structural members. However, the quantities of pounds (kilograms) should be shown in the superstructure bill of materials and on the Bridge Summary sheet.

II. Reinforced-Concrete Interior Diaphragms

If the designer determines that cast-in-place concrete interior diaphragms should be used for a particular bridge, he or she should provide the Production Management Division's Structural Services manager with a written justification for the concrete diaphragms. Once the Structural Services manager concurs in the justification, such diaphragms should be detailed on the plans. The required quantities of concrete and reinforcing steel should be incorporated into those for the bridge deck.

Recurring Special Provision 707-B-___, attached hereto, should be called for beginning with the _____, 2006, letting, if concrete diaphragms are to be used.

III. Reinforced-Concrete Interior Diaphragms Detailed, Structural-Steel Interior Diaphragms Permitted

For a structure with completely-developed plans that show details for concrete interior diaphragms, and the designer has determined that steel diaphragms are acceptable, the diaphragm details should not be changed. The contractor will be permitted to substitute steel diaphragms for the concrete diaphragms. The substitution does not affect the bridge design.

Recurring Special Provision 707-B-___, and Recurring Plan Detail 707-B-___d, also attached hereto, should be called for beginning with the _____, 2006, letting, and through the _____, 2007, letting. Beginning with the September __, 2007, letting, all recurring special provisions will be incorporated into the INDOT *Standard Specifications*, and the recurring plan detail will be incorporated into the INDOT *Standard Drawings*. The provision and detail will then no longer be required to be called for in specific contracts.

Item No. 12-6
Mr. Wright
Date: 6/22/06

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 15, INSERT AS FOLLOWS:

Where grade HPS 70W (HPS 485W) or grade HPS 50W (HPS 345W) steel is shown on the plans, the high performance steel shall be in accordance with 910.02(a).

This item has been revised and item 13-3 has been added to place the material specifications in 910.02.

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
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By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

~~Indiana is in temperature zone designation 2, minimum service temperature -18°C to -34°C with~~ respect to Charpy V-notch impact requirements.

64-1.08 Other Design Considerations

At stress limit states, a beam should be designed for the sum of the steel and concrete slab dead loads acting on the beam alone, plus the superimposed dead load and live load acting on the composite section. Shrinkage need only be considered for a very long span or unusual configurations. At strength limit states for a compact section, large-scale inelastic activity is presumed to rearrange stress distributions in a section such that the history of stress build-up need not be considered. At a non-compact section where the factored flexural resistance is limited to the yield stress, the history of stress build-up must be considered.

An appendix to Section 6 has been provided in the *LRFD Specifications*. Appendix D provides formulas for computing the plastic moment for both positive and negative moment sections. It also explains procedures for determining the yield moment of a composite section. Appendix C provides a step-by-step approach for the design of a steel bridge superstructure. Appendix C is a convenient starting point for the design process after the entire *LRFD Specifications* have been ~~mastered.~~

64-2.0 MATERIALS

Reference: Article 6.4

64-2.01 Structural Steels

64-2.01(01) Selection

The most cost-effective choice of steel grade is unpainted ASTM A 709M Grade 345W weathering steel. Its initial cost advantage compared to painted high-strength steel (e.g., A 709M Grade 345) can range up to 15%. When compared to painted ASTM A 709M Grade 250 steel, the cost advantage is approximately 20%. If future repainting costs are considered, the cost advantage is more substantial. This reflects, for example, environmental considerations in the removal of paint, which can make the use of painted steel prohibitive.

Except for long spans, the use of steel grades higher than Grade 345 may not be cost effective. In the traditional span ranges of 45 m to 60 m, optimization studies have demonstrated that the higher strength ASTM A 709M Grade HPS 485W often carries a cost premium of approximately

20% compared to Grade 345W. The use of Grade HPS 485W, when compared to Grade 345W, typically incurs the disadvantages as follows:

1. The material cost is approximately 15% higher.
2. Lighter sections with higher strength result in increased fatigue stress ranges with no offsetting increase in nominal fatigue resistance.
3. Lighter compression flanges near supports may increase the lateral bracing requirements.
4. Although seldom used for a typical design, moment redistribution and inelastic analysis procedures are not permitted with Grade HPS 485W.

Approval to use Grade HPS 485W steel will be made by the Design Division Chief for each INDOT-route structure. The economic analysis prepared at the structure type and size stage will serve as the basis for this decision. For a local public agency structure, the designer must obtain the written approval of an elected official of the agency.

Despite its cost advantage, the use of weathering steel is not appropriate in all environments and at all locations. The application of weathering steel and its potential problems are discussed in depth in FHWA *Technical Advisory: Uncoated Weathering Steel in Structures*, October 3, 1989. Also the proceedings of the Weathering Steel Forum, July 1989, are available from the FHWA Office of Implementation, HRT-10. Weathering steel should not be used where any of the following adverse conditions exist.

1. Environment. Weathering steel should not be used in an industrial area where concentrated chemical fumes may drift onto the structure. If in doubt, its suitability should be determined by a corrosion consultant.

2. Location. Weathering steel should not be used at a grade separation in a "tunnel" condition, which is produced by a depressed roadway section with narrow shoulders between vertical retaining walls, with a shallow vertical clearance, and with deep abutments adjacent to the shoulders. This "tunnel" effect prevents roadway spray from being dissipated and spread by air currents. Note that there is no evidence of salt spray corrosion where the longitudinal extent of the vertical walls is limited to the abutment itself, and roadway spray can be dissipated on both approaches.

3. Low-Level Water Crossing. Sufficient clearance over a body of water should be maintained so that water vapor condensation does not result in prolonged periods of wetness on the steel. For weathering steel, clearance to the bottom flange should be at least 3.0 m over sheltered, stagnant water and at least 2.5 m above average low water levels for running streams.

Where unpainted weathering steel is inappropriate, and a concrete-members alternative is not feasible, the most economical painted steel is ASTM A 709M Grade 345 steel in both webs and flanges.

The FHWA *Technical Advisory: Uncoated Weathering Steel in Structures* is an excellent source of information, but its recommendation for partial painting of the steel in the vicinity of deck joints should not be considered the first choice. The best solution is to eliminate deck joints. In a shorter bridge, the end joint is replaced by an integral end bent (see Chapter Sixty-seven).

64-2.01(02) Hybrid Girders

Grade HPS 485W flanges and Grade 345W webs or Grade 345 flanges and Grade 250 webs are permitted.

~~64-2.01(03) Details for Unpainted Weathering Steel~~

The following drainage treatments should be considered to avoid premature deterioration.

1. A drip bead should be provided at the end of each deck overhang.

2. The number of bridge deck drains should be minimized, the drainage pipes should be generous in size, and they should extend below the steel soffit as specified in Chapter Thirty-three.

3. Eliminate details that serve as water and debris traps. Seal or paint overlapping surfaces exposed to water. This applies to non-slip-critical bolted joints. Slip-critical bolted joints or splices should not produce rust-pack where the bolts are spaced according to the *LRFD Specifications* and, therefore, do not require special protection.

4. Consider protecting pier caps and abutment walls to minimize staining.

5. Consider wrapping the piers and abutments during construction to minimize staining while the steel is exposed to rainfall.

6. If an expansion joint is used, paint the superstructure steel within 3 m of the joint.

~~64-2.02 Bolts~~

~~Reference: Article 6.4.3~~

Item No. 12-7
Mr. Wright
Date: 6/22/06

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 48,INSERT AS FOLLOWS:

Fabrication of high performance steel shall be in accordance with the AASHTO Guide Specifications for Highway Bridge Fabrication with HPS 70W Steel, an addendum to ANSI/AASHTO/AWS D1.5M/D1.5:2002, except as modified herein.

Other sections containing specific cross references:

724.03(a) Pg 700-151
724.03(c) Pg 700-151

General Instructions to Field Employees
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Update Required? Y___ N___
By - Addition or Revision

Recurring Special Provisions potentially affected:

None

Standard Sheets potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

Item No. 12-8
Mr. Wright
Date: 6/22/06

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 48, INSERT AS FOLLOWS:

Only fabricators meeting the requirements of the AISC Quality Certification Program, "Major Steel Bridges (Cbr)" with "Fracture Critical Members Endorsement (F)", or approved equal, may be used to fabricate using high performance steel. Prior to approval for fabrication, the results of the latest AISC certification review shall be made available to the Engineer to determine if items critical to successful fabrication meet the needs of the specific work.

Other sections containing specific cross references:

None

General Instructions to Field Employees
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Update Required? Y___ N___
By - Addition or Revision

Recurring Special Provisions potentially affected:

None

Standard Sheets potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, BEGIN LINE 91,DELETE AND INSERT AS FOLLOWS:

711.08 Mill Test Reports

Prior to, or concurrent with, the fabrication, ~~four copies~~ *a copy* of *the* mill test report~~s~~ shall be furnished. If the manufacturer's mill test reports are not available, tests shall be made

Other sections containing specific cross references:

910.02(c) Pg 900-72
910.02(d) Pg 900-73

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

Item No. 12-10
Mr. Wright
Date: 6/22/06

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 138, INSERT AS FOLLOWS:

Short term application of heat to high performance steel for purposes of heat curving, heat straightening, camber and sweep adjustment, or other reasons is limited and not to exceed 1100°F (590°C). All applications of heating shall be done by procedures approved by the Department.

Other sections containing specific cross references:

711.59 Pg 700-87

General Instructions to Field Employees
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Update Required? Y___ N___
By - Addition or Revision

Recurring Special Provisions potentially affected:

None

Standard Sheets potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

SECTION 711, AFTER LINE 399, INSERT AS FOLLOWS:

(c) Welding of High Performance Steel

All welding on high performance steel shall be in accordance with the ANSI/AASHTO/AWS D1.5M/D1.5 Bridge Welding Code, hereinafter referred to as the Bridge Welding Code, except as modified herein and by the AASHTO Guide Specifications for Highway Bridge Fabrication with HPS 70W Steel, an addendum to the 2002 Edition of the Bridge Welding Code.

Only submerged arc welding, SAW, and shielded metal arc welding, SMAW, processes will be permitted. Consumable handling requirements shall be in accordance with the Bridge Welding Code, Section 12.6.5 and 12.6.6, when using reduced preheat as described in Table 3 of the Guide, except that SAW consumables for matching weld metal shall meet the hydrogen control level of H4 in accordance with Section 12, Article 12.6.2. Consumable handling requirements shall meet the provisions of The Bridge Welding Code, Section 4, when using the preheat requirements of Table 4.4, except that the diffusible hydrogen level must never exceed H8. SMAW consumables may meet diffusible hydrogen levels of either H4 or H8 except the higher preheat and interpass temperatures as noted in Table 3 of the AASHTO Guide Specifications for Highway Bridge Fabrication with HPS 70W Steel shall apply to H8 conditions.

Filler metals used to make single pass fillet welds for web to flange applications which join HPS 70W steel plates, HPS 70W to grade 50W plates and for attaching stiffeners and connection plates to grade HPS 70W (HPS 485W) webs and flanges, shall be in accordance with the Bridge Welding Code, Table 4.1 for ASTM A 709, grade 50W (ASTM A 709M, grade 345W) base metal. Filler metals for single pass 5/16" fillet welds need not meet the requirements for exposed bare applications.

Filler metals used for all complete penetration groove welds joining grade HPS 70W (grade HPS 485W) plate to ASTM A 709, grade HPS 50W (A 709M, grade HPS 345W) or grade 50W (grade 345W) plate shall conform to the requirements for welding Grade 50W base metal.

Filler metals used for all complete penetration groove welds joining grade HPS 70W (grade HPS 485W) plates to grade HPS 70W (grade HPS 485W) plates shall conform to the requirements for HPS 70W (HPS 485W) base metal as follows:

1. *Submerged Arc Welding process:*

   Wire - LA85 by Lincoln Electric Company
   Flux - MIL800HPNi by Lincoln Electric Company

2. *Shielded Metal Arc Welding process*

   *Matching - E9018MR**
   *Undermatching - E7018MR**

* *The designator 'MR', for moisture resistant coating, is required for all SMAW electrodes used for welding HPS 70W [HPS 485W] steels.*

The Contractor may request approval of alternate consumables for matching strength welds in lieu of the above filler metals for SAW. The request for approval shall include documentation of successful welding and shall also include diffusible hydrogen tests, both in accordance with the Bridge Welding Code.

All welding procedures shall be qualified in accordance with the Bridge Welding Code Section 5, Qualification. In general, the provisions of Article 5.12 shall apply. Qualification tests shall measure strength, toughness and ductility, with results evaluated in accordance with Article 5.19. If specified on the plans, additional tests shall measure the Charpy V-notch toughness of the coarse grained area of the heat affected zone, HAZ. The notch in the specimens shall be carefully located in the coarse grained area of the HAZ, as determined by macro-etching the specimens prior to machining and testing. The toughness requirement for the HAZ shall be the same as the weld metal.

All procedure qualification tests shall be ultrasonically tested in accordance with the requirements of the Bridge Welding Code, Section 6, Part C. Evaluation shall be in accordance with Table 6.3, UT Acceptance – Rejection Criteria – Tensile Stress. Indications found at the interface of the backing bar may be disregarded regardless of the defect rating.

A representative of the Department must witness all welding procedure specification qualification tests.

Results of the welding procedure specification qualification tests and final welding procedure specifications shall be submitted to the Engineer for review and approval.

In general, post weld heat treatment will not be required. The use of such post weld heat treatment will require additional qualification testing.

Wherever magnetic particle testing is done, only the yoke technique will be allowed, as described in Section 6.7.6.2 of the Bridge Welding Code, modified to test using alternating current only.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, CONTINUED.

Other sections containing specific cross references:

None

General Instructions to Field Employees
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Update Required? Y___ N___
By - Addition or Revision

Recurring Special Provisions potentially affected:

None

Standard Sheets potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, BEGIN LINE 978,DELETE AND INSERT AS FOLLOWS:

711.72 Method of Measurement

~~Plain~~ *High performance steel, plain* structural steel shapes, fabricated steel, steel castings, iron castings, bolts, pins, rollers, rockers, anchor bolts, and threaded rods will be measured by the pound (kilogram). If the Schedule of Pay Items includes a lump sum item for structural steel, all

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

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By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, BEGIN LINE 1000, INSERT AS FOLLOWS:

711.73 Basis of Payment

The accepted quantities of *high performance steel*, plain structural steel shapes, fabricated steel, steel castings, iron castings, bolts, pins, rollers, rockers, anchor bolts, and threaded rods will be paid for at a contract lump sum price if the Schedule of Pay Items includes a lump sum pay item for structural steel. Changes from the estimated quantities shall be in accordance

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

Item No. 13-1
Mr. Kuchler
Date: 6/22/06

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 506, BEGIN LINE 113, INSERT AS FOLLOWS:

The trial batch shall be of sufficient quantity to allow the Engineer to perform all required tests from the same batch. Trial batch concrete shall not be used for more than one test.

A trial batch will not be required when the total quantity of partial depth patching or full depth patching will require less than 10 cyd (8 m^3) of material per contract.

Other sections containing specific cross references:

506.03 Pg 500-38

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
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Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

Item No. 13-2
Mr. Kuchler
Date: 6/22/06

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 610, BEGIN LINE 30, INSERT AS FOLLOWS:

Dense graded subbase shall be constructed in accordance with 302. PCCP for approaches shall be constructed in accordance with 502, *except the following. The CMDS shall be submitted to the Engineer for approval and is not required to be submitted to the DMTE. Utilization of the Department provided spreadsheet is not required.*

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

SECTION 729, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 729 – PATCHING NON-DECK AREAS OF BRIDGE STRUCTURES

729.01 Description

This work shall consist of the removal of existing concrete from outside the deck area of a bridge structure and replacing such concrete with new mortar or concrete in accordance with 105.03.

729.02 Materials

Materials shall be in accordance with the following:

Concrete, Class A.....702.02
Epoxy Resin Adhesive 909.11

The cement shall be portland cement type I.

Mortar shall consist of one part portland cement to two parts No. 23 sand.

An epoxy resin adhesive shall be selected from the Department's list of approved Non-Vapor Barrier Type Bonding Agents.

CONSTRUCTION REQUIREMENTS

729.03 Construction Requirements

(a) Concrete Removal

Areas of unsound concrete to be removed will be marked by the Engineer. Removal of the unsound concrete shall be performed by handchipping. Handchipping tools may be hand or mechanically driven. Jack hammers shall not be heavier than nominal 45 lb (20.5 kg) class and chipping hammers shall not be heavier than nominal 15 lb (6.8 kg) class. Only handchipping tools shall be used when removing concrete within 1 in. (25 mm) of reinforcing steel. Mechanically driven tools shall be operated at a maximum angle of 45 degrees from the concrete surface. Power-driven hand tools for removal by hand chipping will be permitted, as set out above.

Regardless of the method of removal, the removal operation shall be stopped if it is determined that sound concrete is being removed. Appropriate recalibration, or changes in equipment and methods shall be performed prior to resuming the removal operation.

Where the bond between the existing concrete and reinforcing steel has been destroyed, the concrete adjacent to the steel shall be removed to a minimum clearance of 1 in. (25 mm) around the entire periphery of the exposed steel. Exposed reinforcing steel shall not be damaged by the removal operation. All damaged reinforcing steel shall be replaced or repaired as directed.

A vertical cut shall be made at least 1 in. (25 mm) outside the spalled area before the mortar or concrete is placed. The cut shall be a minimum 1 in. (25 mm) deep or to the top of reinforcing steel, whichever is less.

(b) Patching

After the concrete removal operation is completed and just prior to placing the patches, all patch areas shall be heavily sandblasted to expose fine and coarse aggregates and to remove unsound concrete or laitance layers from the surface. Exposed reinforcing steel and the concrete under and around the exposed steel shall be thoroughly cleaned by sandblasting. The surface shall be then cleaned free of all dust, chips, water, and foreign material to the extent necessary to produce a firm, solid surface for adherence of the new concrete. The final surface shall be free of oil, grease and water. The air lines for sandblasting and air cleaning shall be equipped with oil traps.

The surfaces of the prepared cavities and all the exposed reinforcing steel within the cavities shall be coated with an epoxy resin adhesive in accordance with 722.06(a)1 prior to placement of the patching materials.

Cavities of 1/2 in. (13 mm) in depth or greater shall be filled with concrete. Cavities less than 1/2 in. (13 mm) in depth, shall be filled with mortar.

The concrete patches shall be finished to closely match the texture and finish of the abutting existing concrete.

The concrete patches shall be cured in accordance with 702.22.

729.04 Method of Measurement

Patching of non-deck areas of bridges will be measured by the square foot (square meter). Individual patches of 0.5 to 1.0 ft^2 (0.5 to 1.0 m^2) will be measured as 1 ft^2 (1 m^2). Individual patches of less than 0.5 ft^2 (0.5 m^2) will not be measured for payment. All faces of a multi-faced patch will be measured accordingly for payment.

729.05 Basis of Payment

This work will be paid for at the contract unit price per square foot (square meter) for concrete, A, patching.

Payment will be made under:

Pay Item	***Pay Unit Symbol***
Concrete, A, Patching	*SFT (m^2)*

The areas where the patching exceeds an average of 4 in. (100 mm) in depth will be paid for at a price to be determined by multiplying the contract unit price for concrete, A, patching by the following factors:

(a) For portions thereof whose average depth is greater than 4 in. (100 mm) but not more than 6 in. (150 mm) 1.25

SECTION 729, CONTINUED.

(b) For portions thereof whose average depth is greater than 6 in. (150 mm) but not more than 8 in. (200 mm) 1.50

(c) For portions thereof whose average depth is greater than 8 in. (200 mm) but not more than 10 in. (250 mm) 1.75

(d) For portions thereof whose average depth is greater than 10 in. (250 mm) but not more than 12 in. (300 mm) 2.00

(e) For all portions thereof whose average depth is greater than 12 in. (300 mm), the work shall be done as extra work. Payment will be made in accordance with 104.03.

The cost of removing the existing concrete, furnishing, hauling, and placing all materials, preparing the surface, individual patches of less than 0.5 ft^2 (0.5 m^2), and all necessary incidentals shall be included in the cost of concrete, A, patching.

The cost of replacing or repairing damaged reinforcing steel shall be included in the cost of concrete, A, patching.

Other sections containing specific cross references:

None

Recurring Special Provisions potentially affected:

729-B-009

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
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Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 908, BEGIN LINE 18, DELETE AND INSERT AS FOLLOWS:

Band couplers for type I and type II pipe shall have corrugations that mesh with the corrugations of the pipe~~s~~ sections being joined or the ~~annuar~~ *annular* rerolled ends of those pipe sections. *Band couplers with projections (dimples) may be used with pipe with either annular or helical corrugations.* Band couplers for type IA and IIA pipe shall have corrugations that mesh with the corrugations of the pipe or shall be gasketed flat bands.

Other sections containing specific cross references:

715.02(a) Pg 700-106
715.02(e) Pg 700-107
908.04 Pg 900-50
908.06 Pg 900-50
908.07 Pg 900-51
908.08 Pg 900-52
908.09(a) Pg 900-52
908.09(b) Pg 900-52

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 171, INSERT AS FOLLOWS:

(a) Structural Steel

Unless otherwise specified, structural steel shall be in accordance with *ASTM* A 709, grade 36 (A 709M, grade 250).

High performance steel, HPS, shall be in accordance with ASTM A 709 (A 709M). In addition to the conditions listed in Section 6.7 of ASTM A 709 (A 709M), high performance steel may be furnished as hybrid/mixed design structural components using high performance steel plates in combination with high strength, low alloy steel plates and shapes, for welded or bolted applications in bridge construction.

The impact testing requirements for HPS in accordance with 10.1 and 10.2 of ASTM A 709 (A 709M) shall meet temperature zone 2.

Other sections containing specific cross references:

910.14(c) Pg 900-86

Recurring Special Provisions potentially affected:

None

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Addition or Revision
Frequency Manual
Update Required? Y___ N___
By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn ____

Received FHWA Approval? ____