INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING AGENDA

Driving Indiana's Economic Growth

February 28, 2007

MEMORANDUM

TO: Standards Committee

FROM: Dannie L. Smith, Secretary

RE: Agenda for the March 15, 2007 Standards Committee Meeting

A Standards Committee meeting is scheduled for 9:00 a.m. on March 15, 2007 in the N755 Bay Window Conference Room. Please enter the meeting through the double doors directly in front of the conference room. The following agenda items are listed for consideration.

New Business

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Item 18-15 Standard Drawings	Ms. Rearick 707-BEBP-01, 02 & 03	3/15/07	37
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cc: Committee Members (11)
FHWA (4)
ICA Representative (1)

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 110, BEGIN LINE 9, DELETE AND INSERT AS FOLLOWS:

110.02 Limitations

For the purpose of payment, the mobilization portion of this work will be limited to 5% of the original total contract price. The remainder of the work will be considered demobilization. The first progress estimate will include a percentage payment of the pay item for mobilization and demobilization that is ~~no more than~~ *equal to the lesser of* 5% of the original total contract price *or the contract lump sum price for the pay item mobilization and demobilization*. ~~The exact amount will be a portion of the lump sum price which is an even percentage of the pay item.~~ The balance of the lump sum price will be paid when the contract has been completed and accepted.

SECTION 110, BEGIN LINE 31, INSERT AS FOLLOWS:

The cost of all materials, equipment, tools, labor, transportation, operations, and incidentals *required for mobilization and demobilization* shall be included in the cost of this work.

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

Item No. 18-2
Mr. Kuchler
Date: 03/15/07

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 203, BEGIN LINE 15, DELETE AND INSERT AS FOLLOWS:

203.03 Rock Excavation

Rock excavation shall consist of igneous, metamorphic, and sedimentary rock which cannot be excavated without blasting~~; the use of a power shovel of not less than 1 cu yd (0.76 m^3) capacity, properly used, having adequate power and in satisfactory running condition; or the use of other equivalent powered equipment~~ *or using rippers. The District Geologist will be notified and will inspect the material to verify it meets the requirements set out herein. This verification must be received prior to the beginning of the removal operations*. Rock excavation shall also include all boulders or other detached stones each having a volume of ~~1/2 cu yd (0.4 m^3)~~ *2.5 cu yd (2 m^3)* or more.

Other sections containing specific cross references:

203.07, Pg 200-20
203.15, Pg 200-27

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

Item No. 18-3
Ms. Rearick
Date: 03/15/07

POLICY CHANGE

The following Design Memorandum establishes a procedure for rehabilitating a historic bridge on a local road.

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

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

FROM: **_____**

Anthony L. Uremovich
Design Resources Engineer
Production Management Division

SUBJECT: **Treatment of Historic Bridge on Low-Volume Local Road**

ADDS: ***Indiana Design Manual*** **Section 72-7.0**

EFFECTIVE: **_____, 2007, Start Plan Development Date**

I. INTRODUCTION

A historic bridge is one which was built prior to 1966, and is in, or is eligible for inclusion in, the National Register of Historic Places. The Department has developed a listing of all publicly-owned historic bridges that are National Register-eligible or -listed.

The purpose of this Section is to define standards to be used to determine if a historic bridge on a low-volume local road can be rehabilitated for continued vehicular use. A low-volume road is defined as having a design year ADT of less than or equal to 400.

A historic-bridge owner must first consider rehabilitating the bridge in accordance with this Section. The rehabilitation alternatives must include the option of a one-way pair that involves rehabilitating the existing bridge and constructing a new parallel bridge. If the bridge cannot be rehabilitated in accordance with one or more of the design criteria described in Section III below, the owner may request a Level One design exception(s).

II. TYPES OF HISTORIC BRIDGES

A historic bridge will be classified as either Select or Non-Select. The Department is in the process of determining each bridge's classification in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the Indiana Department of Transportation, the Indiana State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Management and Preservation of Indiana's Historic Bridges (PA)*. A listing of Select and Non-Select bridges will be issued by the Production Management Division's Services and Cultural Resources Team. Until that time, each historic bridge should be regarded as Select.

A. Select Bridge

A Select bridge has been identified as a historic bridge that is an excellent example of its structure type to be a suitable candidate for preservation. The intent of the *PA* is to preserve Select bridges in place for continued vehicular use. If rehabilitation alternatives are not in accordance with Section III below, and the owner is not granted a design exception or does not request one, the Select bridge must be bypassed or relocated for another use. See the *PA* for further guidance on bypassing and/or relocating the bridge.

B. Non-Select Bridge

A Non-Select bridge has been identified as a historic bridge that is not an excellent example of its structure type, nor is a suitable candidate for preservation. If the rehabilitation alternatives are not in accordance with Section III below, and the owner is not granted a design exception or does not request one, the Non-Select bridge must be marketed for re-use. In accordance with the *PA*, if no party steps forward to assume ownership of the bridge, the bridge may be demolished. See the *PA* for further guidance on marketing and/or demolishing the bridge.

III. DESIGN CRITERIA

A. Structural Capacity

The structural capacity should be in accordance with Figure 07-__A, Historic-Bridge Structural Capacity. The required capacity designations are those described in AASHTO *Standard Specifications for Highway Bridges*.

	Detour Length < 5 mi		5 mi ≤ Detour Length < 10 mi		Detour Length ≥ 10 mi	
Design Year ADT	< 100	100 ≤ ADT ≤ 400	< 100	100 ≤ ADT ≤ 400	< 100	100 ≤ ADT ≤ 400
AASHTO Loading	H-15	HS-15	HS-15	HS-15	HS-15	HS-20
Required Capacity	15 tons	27 tons	27 tons	27 tons	27 tons	36 tons

Notes:

1. *Detour length is defined as the total additional travel a through-bound vehicle would experience from closing the bridge. This is determined by the shortest route on which a vehicle with a loading of HS-20 (36 tons) is legally capable of traveling.*
2. *Vehicles that may use a bridge with AASHTO loading of H-15 (15 tons) or HS-15 (27 tons) include typical farm vehicle (15 tons), school bus*

carrying up to 84 passengers (15 tons), loaded garbage truck (27 tons), and single-unit fire engine (27 tons).

3. *Vehicles that may use a bridge with AASHTO loading of HS-20 (36 tons) include all of the H-15 and HS-15 vehicles, plus payloaded ready-mix-concrete truck (30 tons), and tractor-apparatus fire engine (36 tons).*
4. *A bridge on a dead-end road will be considered as having a detour length greater than 10 miles.*
5. *The annual traffic growth factor used in determining Design Year ADT must be justified.*

HISTORIC-BRIDGE STRUCTURAL CAPACITY
Figure 07-__A

B. Hydraulic Capacity

Improvements may consist of removal of sand bars or debris, channel clearing, or adding a supplemental structure. If a bridge is to remain in place and its approaches are realigned, the removal of existing roadway fill is an option toward improving the hydraulic capacity.

C. Bridge Width

The minimum bridge width should be in accordance with Figure 07-__B, Historic-Bridge Minimum Clear-Roadway Width.

Lanes on Bridge	Design Year ADT < 100	100 ≤ Design Year ADT ≤ 400
One [1]	15 ft	16 ft
Two	18 ft	20 ft

Notes:

1. *Use the given values for rehabilitation of a Select bridge in a one-way-pair or two-way configuration. Use the given values for rehabilitation of a Non-Select bridge in a one-way-pair configuration. For rehabilitation of a Non-Select bridge in a two-way configuration, the owner must obtain a design exception.*
2. *The minimum bridge width is defined as the most restrictive minimum distance between curbs, rails, or other obstructions on the bridge roadway.*
3. *The annual traffic growth factor used in determining Design Year ADT must be justified.*

HISTORIC-BRIDGE MINIMUM CLEAR-ROADWAY WIDTH
Figure 07-__B

D. Bridge Railing

Bridge railing may be left in place if there is no documented crash history or other evidence of crash history within the past 5 years such as damaged railing or concerns by local police agencies. If only slightly damaged, railing should be replaced in kind. If there is evidence of crash history within the past 5 years, the possible causes should be corrected, or new bridge railing provided as described in *Indiana Design Manual* Section 61-6.0.

E. Approach Guardrail

Approach guardrail, if in place, should remain. If not in place, it may be omitted if there is no documented crash history or other evidence of crash history within the last 5 years, such as vehicles hitting the ends of the bridge railing or vehicles leaving the roadway. Crash history, such as that regarding damaged ends of bridge railings, may be an indicator of the need for approach guardrail.

In addition to those guardrails which the Department has standardized, there are others which have passed NCHRP 350 crash tests for specified Test Levels. If one of these devices is desired to be used for a specific project, the documentation to be provided is as follows:

1. an acceptance letter from the FHWA that approves the device for use; and

2. complete details for the device as successfully crash tested.

F. Design Speed

The existing posted speed should be used as the design speed. If the road is not posted, an engineering speed study should be performed and the road should be posted between logical termini.

G. Approach Roadways (Horizontal and Vertical Alignment)

These should be analyzed within 300 ft of either side of the bridge in accordance with *Indiana Design Manual* Sections 55-4.02, 55-4.03, and 55-4.04.

IV. ECONOMIC AND OTHER CRITERIA

A. Select Bridge

To determine the appropriateness of rehabilitating a Select bridge, the cost effectiveness should be assessed as follows:

1. if the initial rehabilitation cost is less than 80% of the replacement cost, rehabilitation is warranted; or

2. if the initial rehabilitation cost is equal to or greater than 80% of the replacement cost, the owner may request further consultation with FHWA to determine rehabilitation eligibility.

A rehabilitation project should result in a 20-year design life for the rehabilitated bridge.

A Select bridge may be rehabilitated and left in place, and a new bridge and new approaches may be built adjacent to it. This effectively creates one bridge and approaches for each direction of travel. For this situation, the new bridge must meet all design standards for a new bridge. Where appropriate, the new 1-way bridge must be able to accommodate future widening to provide for 2-way travel.

B. Non-Select Bridge

To determine the appropriateness of rehabilitating a Non-Select bridge, the cost effectiveness and other criteria should be assessed as follows:

If the initial rehabilitation cost is greater than or equal to 40% of the replacement cost, or the bridge meets any two of the following criteria that cannot be economically corrected as part of a rehabilitation project, then replacement is warranted.

1. The bridge's waterway opening is inadequate (i.e., National Bridge Inventory Item 71 is rated 2 or 3).

2. The bridge has a documented history of catching debris due to inadequate freeboard or due to piers in the stream.

3. The bridge requires special inspection procedures (i.e., the first character of National Bridge Inventory Item 92A or 92C is Y).

4. The bridge is classified as scour-critical (i.e., National Bridge Inventory Item 113 is rated 0, 1, 2, or 3.

5. A fatigue analysis conducted in accordance with *Indiana Design Manual* Section 72-2.03(04) indicates the bridge has fatigue-prone welded details that are either expected to reach the end of their service lives within the next 20 years.

6. The bridge has a Sufficiency Rating of lower than 35.

A rehabilitation project should result in a 20-year design life for the rehabilitated bridge.

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Lack of clear procedure for rehabilitating a historic bridge on a local road.

PROPOSED SOLUTION: New procedure identifies, for bridge owners, which local-road bridges are historic, and for designers, what design criteria for rehabilitation will apply. This procedure has been endorsed by FHWA, specifically Keith Hoernschemeyer. A procedure for treating a historic bridge on a road other than a local road has not yet been developed.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: new section in Part VI, Structureal Design 72-7.0, Treatment of Historic Bridge on Low-Volumne Local Road.

APPLICABLE SECTION OF GIFE: None

Submitted By: Anne Rearick

Title: Structural Services Office Manager

Organization: INDOT

Phone Number: 2-5152

Date: 2-20-07

Item No. 18-4
Mr. Heustis
Date: 03/15/07

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 501, BEGIN LINE 202, DELETE AS FOLLOWS:

501.12 Placement

Placement of PCCP shall be by the slipformed or formed methods with equipment specified in 508.04. The subgrade or subbase shall be uniformly moist at the time of PCCP placement. Excessively dry subgrade or subbase shall be sprinkled with water. ~~Dowel bars shall be coated with a bond breaking material and the coating shall be evident at the time of placement.~~

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Format of Sections 501, 502 & 503 relating to dowel bar assemblies

PROPOSED SOLUTION: Propose to eliminate duplicate language in 501.12 & 502.09 since dowel bar specs exist in 503. (See attached revision)

APPLICABLE STANDARD SPECIFICATIONS: 501, 502, 503

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

Submitted By: R. Heustis

Title: Manager, Office of Construction Tech Supportt

Organization: INDOT

Phone Number: 317-234-2777

Date: 02/15/07

Item No. 18-5
Mr. Heustis
Date: 03/15/07

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 501, BEGIN LINE 396, DELETE AND INSERT AS FOLLOWS:

When the profilograph is ~~being~~ used, the pavement variations shall be corrected ~~to a profile index of 12.0 in./0.1 mi (30 mm/0.16 km) or less~~ *in accordance with 501.28(d).* In addition to the requirements for the profile index, all areas having a high or low points deviation in excess of 0.3 in. (8 mm) shall be corrected. Verifying profilograph measurements will be taken only in the 0.1 mi (0.16 km) length where corrections have been performed.

Other sections containing specific cross references:

502.20, Pg 500-24
507.06, Pg 500-46

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:

500-R-529

Standard Sheets potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 501, BEGIN LINE 542, DELETE AND INSERT AS FOLLOWS:

(c) Thickness

When test results for pavement thickness do not meet the specified thickness, a pay factor will be assessed as follows:

Sublot Pay Factors For Thickness	
Average Core depth (ACD) Design Depth (DD)	
ACD Minus DD	Pay Factor
> + 0.5 in. (> + 13 mm)	1.05
+ 0.3 in. to 0.5 in. (+ 7 mm to + 13 mm)	1.02
± 0.2 in. (6 mm)	1.00
- 0.3 in. to - 0.5 in. (- ~~6~~ *7* mm to - 13 mm)	0.96
- 0.6 in. to - 0.7 in. (- 14 mm to - 19 mm)	0.90
- 0.8 in. to - 1.0 in. - 20 mm to - 25 mm)	0.80
< - 1.00 in. (< - 25 mm)	*

* The PCCP will be adjudicated as a failed material in accordance with normal Department practice as listed in 105.03. The PCCP may be subject to removal and replacement or left in place with reduced or no payment.

Other sections containing specific cross references:

109.05.1, Pg 100-94
501.27(c), Pg 500-10
501.27(d), Pg 500-10

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

Item No. 18-7
Mr. Heustis
Date: 03/15/07

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 502, BEGIN LINE 172, DELETE AS FOLLOWS:

502.09 Placement

Placement of PCCP shall be by the slipformed or formed methods with equipment specified in 508.04. The subgrade or subbase shall be uniformly moist at the time of PCCP placement. Excessively dry subgrade or subbase shall be sprinkled with water. ~~Dowel bars shall be coated with a bond breaking material and the coating shall be evident at the time of placement.~~

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

Item No. 18-8
Mr. Heustis
Date: 03/15/07

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 503, BEGIN LINE 3, DELETE AND INSERT AS FOLLOWS:

503.01 Description

~~The construction of PCCP joints, dowel bar assemblies, and joint sealing operations shall be in accordance with the following.~~ *This work shall consist of the construction of joints in PCC pavements, placing dowel bar assemblies and joint sealing operations in accordance with 105.03.*

SECTION 503, LINE 11, INSERT AS FOLLOWS:

Chemical Anchor *System* 901.05

SECTION 503, BEGIN LINE 138, INSERT AS FOLLOWS:

(g) After the dowel bar assembly is securely in place, all tie wires which parallel the dowel bars, and are welded to the two continuous parallel spacer bars, shall be cut near the center of the tie. *Dowel bars shall be coated with a bond breaking material and the coating shall be evident at the time of placement of the PCCP.*

SECTION 503, BEGIN LINE 217, DELETE AND INSERT AS FOLLOWS:

503.07 Method of Measurement

D-1 contraction joints and terminal joints will be measured by the linear foot (meter) *as measured perpendicularly across*. ~~The pay length for terminal joints will equal~~ the width of the PCCP.

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

Item No. 18-9
Mr. Heustis
Date: 03/15/07

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 506, BEGIN LINE 247, DELETE AS FOLLOWS:

random crack. Patches greater than 18 ft (5.5 m) shall have type D-1 contraction joints in accordance with 503.~~03(a).~~

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

POLICY CHANGE

EMBEDMENT OF W-BEAM GUARDRAIL POST ON GRADED SHOULDER

DESIGN MEMORANDUM No. 06-XX
POLICY CHANGE

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

FROM: **Richard L. VanCleave**
Design Policy Engineer
Office of Roadway Engineering Services

SUBJECT: **Embedment of W-Beam Guardrail Post on Graded Shoulder**

EFFECTIVE: **XXXXX, 2007 Letting**

REPLACES: **Design Manual Section 49-05(04)**

The policy relating to required guardrail post embedment length on a graded shoulder has been changed. An 8′-0″ long W-Beam guardrail post is required for certain situations where inadequate foundation support behind the standard 7′-0″ long post will exist after initial post placement.

Design Memorandum 06-XX Technical Advisory regarding the use of a standard 7′-0″ long or an 8′-0″ long W-Beam guardrail post has been prepared. An interim design procedure to replace Section 49-5.01(04) of the Indiana Design Manual and the affected standard drawings that required appropriate revisions have been attached to the above technical advisory.

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: See Item 18-11
Motion: M Second: M Ayes: Nays:	Action: Passed as submitted; revised Effective: _____ Letting ____ 2008 Standards Specifications Book ____ 2008 Standards Edition Withdrawn ____ Received FHWA Approval? ____

DESIGN MEMORANDUM No. 06-XX
TECHNICAL ADVISORY

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

FROM: **Richard L. VanCleave**
Design Policy Engineer
Office of Roadway Engineering Services

SUBJECT: **Embedment of W-Beam Guardrail Post on Graded Shoulder**

EFFECTIVE: **XXXXXX, 200X Letting**

The following Standard Drawings, both metric and English, for W-Beam guardrail were revised to incorporate additional information to aid designers in selecting an appropriate W-Beam guardrail post length where the distance from the back face of the guardrail post to the slope break point on a graded shoulder is less than the desirable 0.6 m (2′-0″):

601-WBGA-01
601-WBGC-03

A proposed Design Manual change for Section 49-05.01(04) and the above mentioned Standard Drawings are attached to this technical advisory. Designers are instructed to follow the attached interim procedure to determine the appropriate guardrail post length and the required post embedment depth for the site conditions.

The Standard Specifications have been revised to incorporate this concept change beginning with the XXXXX XX.

The new code number, pay item and pay units for W-Beam guardrail 8 ft (2440 mm) posts are as follows:

601-XXXXX Guardrail Post, W-Beam 8 ft (2440 mm), EACH.

49-5.01(04) Guardrail and Embankment Slopes

The shoulder slope to the front face of a semi-rigid barrier should desirably be between 10:1 and 20:1; however, in no case, should that slope be steeper than 6:1.

The W-Beam guardrail post embedment length must be appropriate either in cohesive or cohesionless soil. The INDOT Standard Drawings present the criteria for location of the guardrail post and the required post embedment length for the corresponding location of the post on a graded shoulder. A 0.6 m (2′-0″) distance on the graded shoulder before the shoulder slope break point, as measured from the back face of the guardrail post, is desirable for adequate soil foundation support. Where site conditions dictate a graded shoulder width behind the back face of the post less than 0.6 m (2′-0″), the guardrail post length should be 2.13 m (7′-0″). Where site conditions dictate that the front face of the guardrail post must be located at or beyond the shoulder break point, the guardrail post length should be increased to 2.43 m (8′-0″) to compensate for the reduced soil foundation support.

Where guardrail posts must be placed on steep shoulder slopes (1:1 or 2:1, etc.) or in aggregate shoulder wedges greater than 75 mm (3″) thick adjacent to the edge of the effective usable (paved) shoulder, the 2.43 m (8′-0″) post discussed above should be used to provide adequate foundation support for the guardrail post.

Item No. 18-11
Mr. Wright
Date: 03/15/07

STANDARD DRAWINGS

The following Standard Drawings are being revised:

601-WBGA-01, W-Beam Guardrail Assemblies
601-WBGC-03, W-Beam Guardrail Components

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:

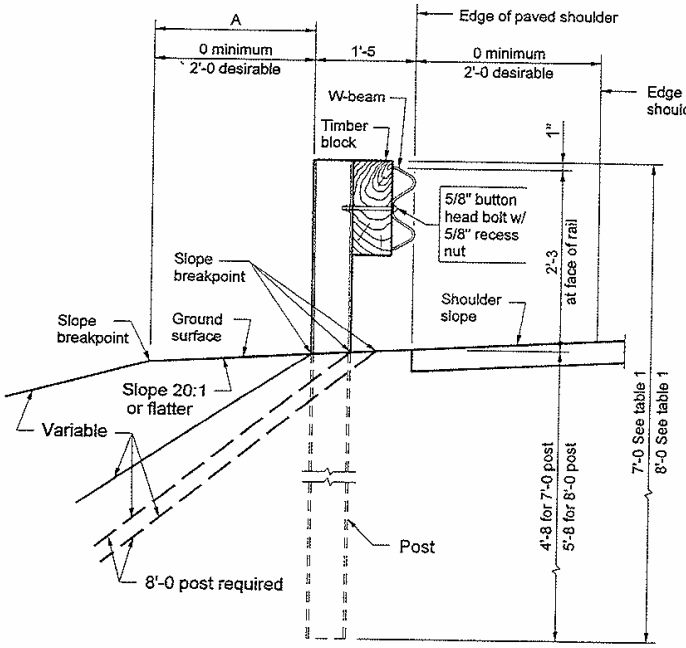
See Above

Motion: M
Second: M
Ayes:
Nays:

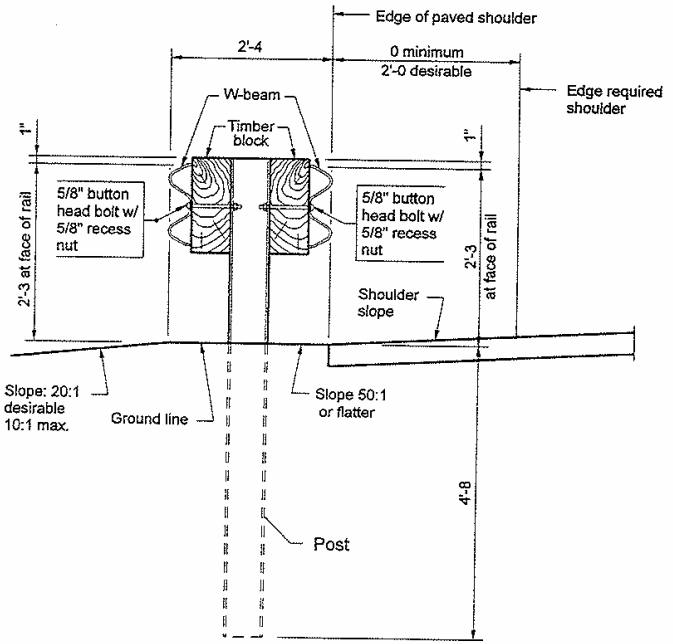
Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____



TYPICAL W-BEAM INSTALLATION AT SHOULDERS



TYPICAL DOUBLE FACED W-BEAM INSTALLATION AT MEDIANS

*TABLE 1
Guardrail Post Length Selection for Installation at shoulders

Distance A	Post Length	Embedment Length
A = 0'-0 to 2'-0	7'-0	4'-8
Shoulder break point at or in front of the front face of guardrail post	8'-0	5'-8
On steep shoulder slopes 1:1 or 2:1	8'-0	5'-8
In aggregate wedges adjacent to the edge of the effective usable shoulder. 3" thick or greater	8'-0	5'-8

*NOTES:

1. For new projects or where the distance A is known, the appropriate embedment length shall be used for the selected post length.

INDIANA DEPARTMENT OF TRANSPORTATION

W-BEAM GUARDRAIL ASSEMBLIES

MARCH 2007

STANDARD DRAWING NO. E 601-WBGA-01

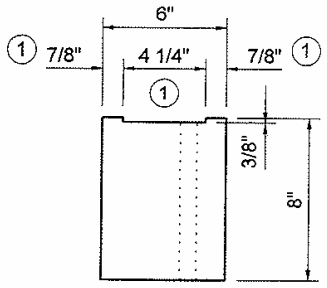
RICHARD L. VanCleave REGISTERED PROFESSIONAL ENGINEER STATE OF INDIANA 9720 DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 3-01-07
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-07
CHIEF HIGHWAY ENGINEER DATE

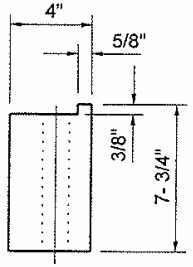
NOTES:

1. These dimensions shall be adjusted as required to accommodate steel post flange.
2. Timber blocks shown in either Detail A or Detail B may be used.

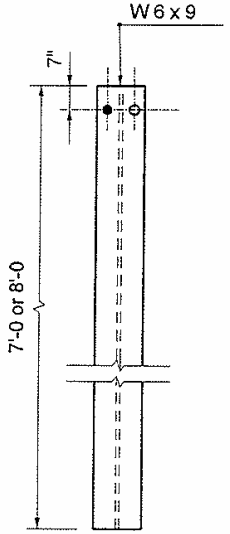


TOP VIEW

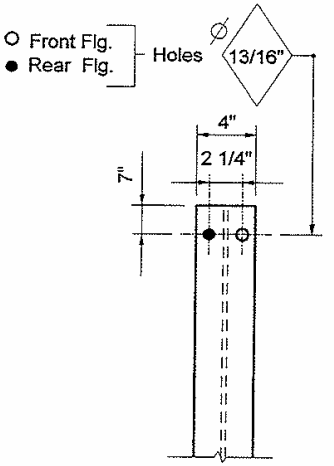
FRONT VIEW



TOP VIEW

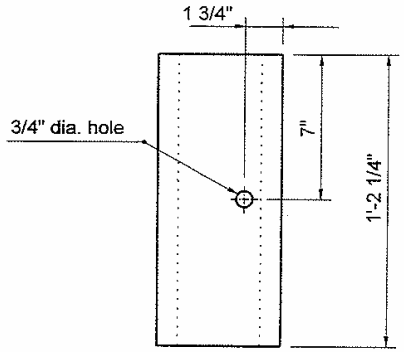


FRONT VIEW



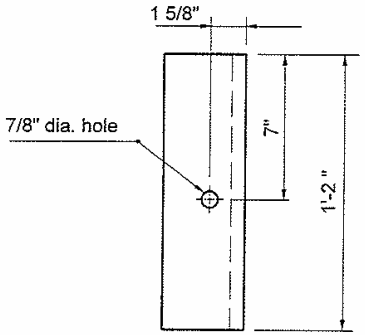
FRONT VIEW

HOLE PATTERN



FRONT VIEW

TIMBER BLOCK DETAIL A



FRONT VIEW

TIMBER BLOCK DETAIL B

STEEL POST DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION

W - BEAM
GUARDRAIL COMPONENTS

MARCH 2007

STANDARD DRAWING NO. E 601-WBGC-03

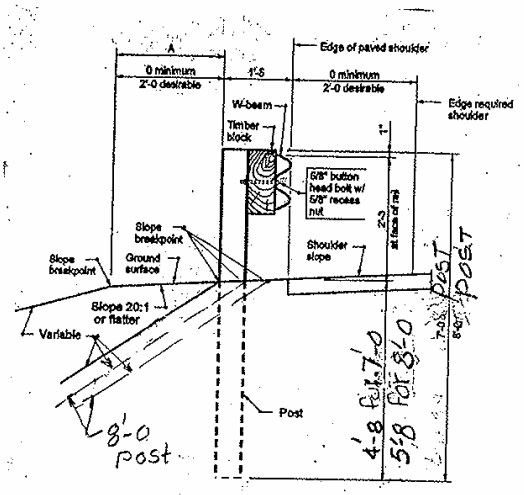
RICHARD L. VanCleave REGISTERED NO. 9 0 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Richard L VanCleave — DESIGN STANDARDS ENGINEER — 3-01-07 DATE

/s/ Richard K Smutzer — CHIEF HIGHWAY ENGINEER — 3-01-07 DATE

GUARDRAIL POST AND EMBEDMENT LENGTH COMPARISION WITH OTHER DOTs



TYPICAL W-BEAM INSTALLATION AT SHOULDERS

DOT	Distance A	Post Length	Embedment Length
INDOT Current	A = 0' min. 2'-0 desirable	7'-0	4'-8
INDOT Proposed	A = 0'- 0 to 2'-0 Shoulder break point at or in front of GR post. On steep shoulder slopes In aggregate wedges	7'-0 8'-0 8'-0 8'-0	4'-8 5'-8 5'-8 5'-8
OHIO	A ≥ 2'-0 A < 2'-0	6'-0 7'-9	3'-8 5'-5
MICHIGAN	A = 2'-0 min. required if A = 0' (at shoulder break point)	6'-0 8'-0	3'-8 5'-8

F:\yadu\COMPARISION GUARDRAIL POST AND EMBEDMENT LENGTH.doc

Item No. 18-12
Mr. Wright
Date: 03/15/07

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 601, BEGIN LINE 52, INSERT AS FOLLOWS:

7 ft (2130 mm) posts, 6 ft (1830 mm) posts may be substituted when approved. *Where shown on the plans or as directed, 8 ft (2440 mm) guardrail posts shall be installed.*

SECTION 601, AFTER LINE 252, INSERT AS FOLLOWS:

Eight foot (2440 mm) W-beam guardrail posts will be measured per each installed.

SECTION 601, AFTER LINE 277, INSERT AS FOLLOWS:

Eight foot (2440 mm) W-beam guardrail posts will be paid for at the contract unit price per each.

SECTION 601, AFTER LINE 286, INSERT AS FOLLOWS:

Guardrail Posts, W-Beam, 8 ft (2440 mm) ..... EACH

Other sections containing specific cross references:

801.17, Pg 800-17
801.18, Pg 800-19

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:

See Item 18-11

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

Item No. 18-13
Mr. Wright
Date: 03/15/07

STANDARD DRAWINGS

The following are proposed new standard drawings:

614-RRGC-01, Railroad Crossing Details, HMA Header
614-RRGC-02, Railroad Crossing Details, RC Header
614-RRGC-03, Railroad Crossing Details, HMA Inter-Track Header
614-RRGC-04, Railroad Crossing Details, RC Inter-Track Header
614-RRGC-05, Railroad Crossing Details, Crown-Out Diagram

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:

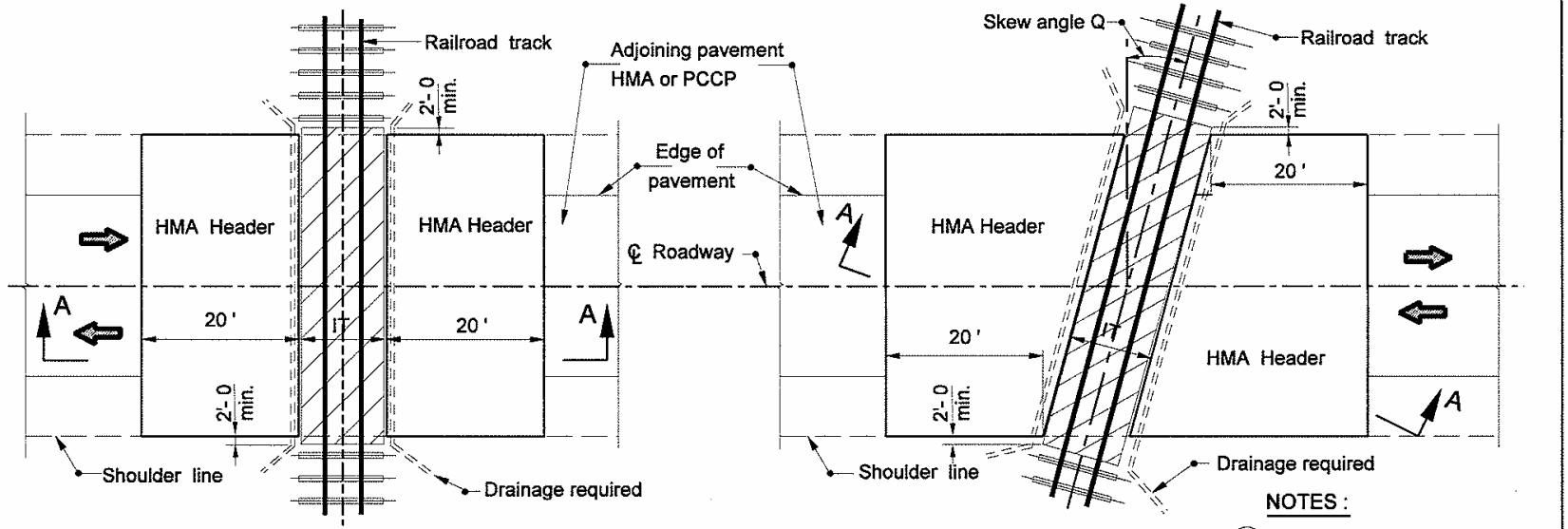
See Above

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

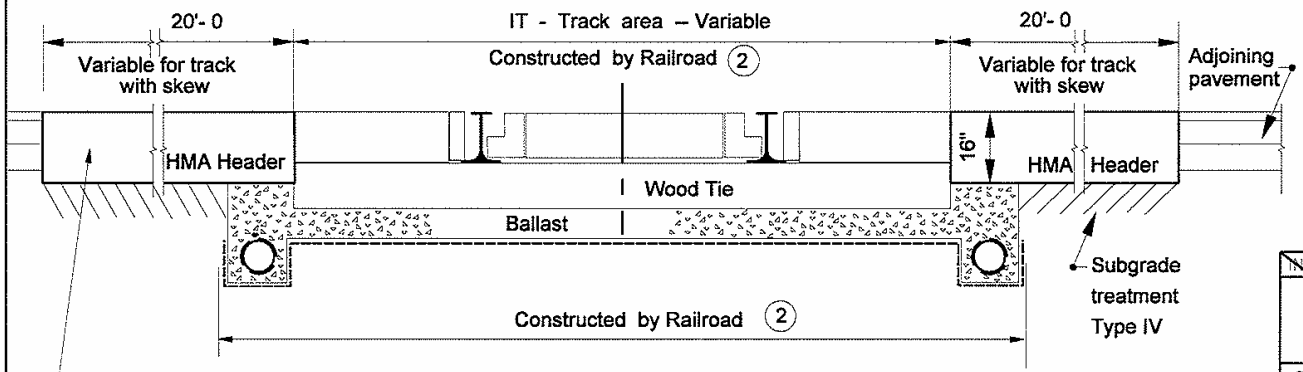
Withdrawn ____

Received FHWA Approval? ____



PLAN - SQUARE TRACK

PLAN - SKEWED TRACK



SECTION A - A

HMA Header Section : (1)
165# / syd HMA, Type_, Surface on
330# / syd HMA, Type_, Intermediate on
1265# / syd HMA, Type_, Base on
Subgrade treatment Type IV

NOTES :

(1) The HMA Type _ shall match that of the adjoining pavement. The HMA Type _ shall be according to existing AADT when the adjoining pavement is PCCP.

(2) Construction between headers to be executed by the railroad company in accordance with details as provided for in the crossing agreement.

INDIANA DEPARTMENT OF TRANSPORTATION

RAILROAD CROSSING DETAILS
HMA HEADER
SEPTEMBER XXXX

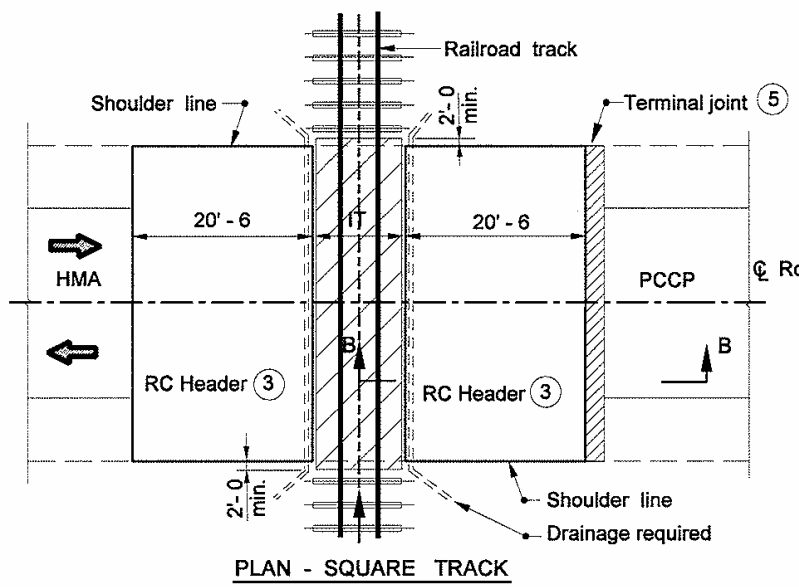
STANDARD DRAWING NO. E 614-RRGC-01

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

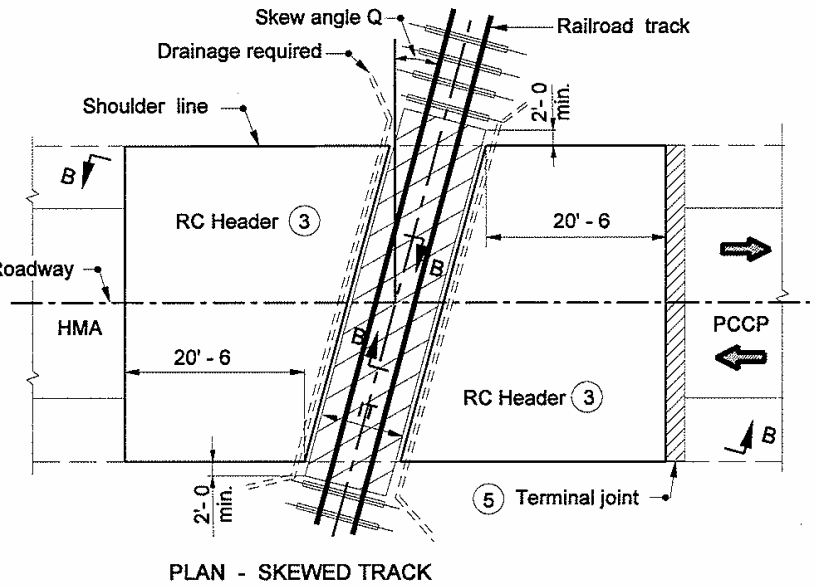
DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

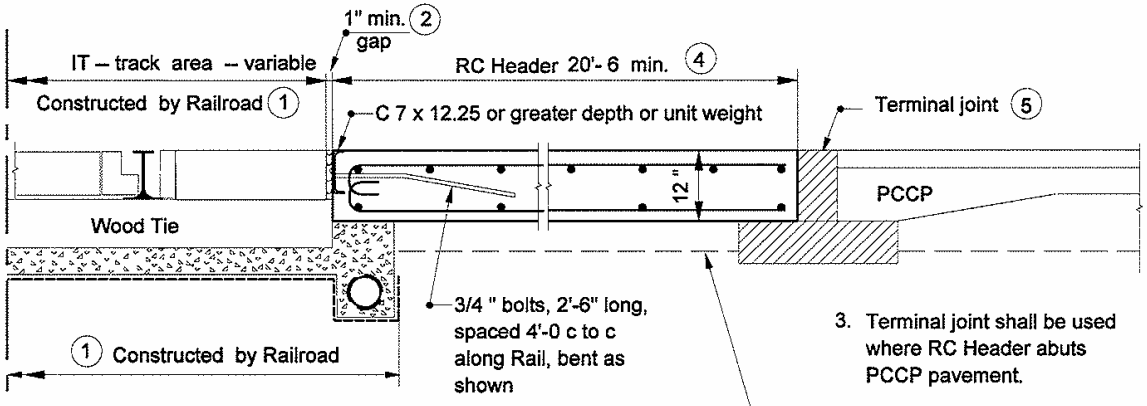
CHIEF HIGHWAY ENGINEER DATE



PLAN - SQUARE TRACK



PLAN - SKEWED TRACK



HALF SECTION B - B

NOTES :

(1) Construction between headers to be executed by the railroad company in accordance with details as provided for in the crossing agreement.

(2) 1 in. min. joint filler

3. Terminal joint shall be used where RC Header abuts PCCP pavement.

(4) For reinforcement details see Standard Drawing E 609-RCBA-01 and E 609-RCBA-03 to -06

(5) For Terminal joint details see Standard Drawing E 609-RCBA-02.

INDIANA DEPARTMENT OF TRANSPORTATION

RAILROAD CROSSING DETAILS
RC HEADER
SEPTEMBER XXXX

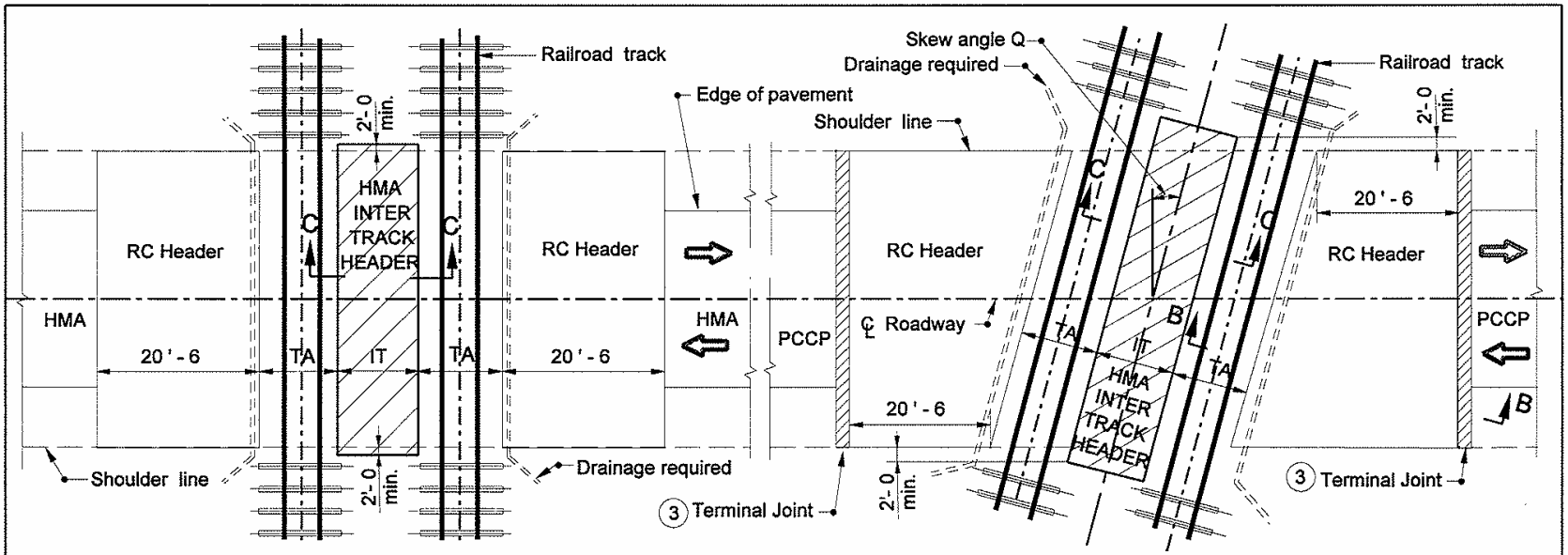
STANDARD DRAWING NO. E 614-RRGC-02

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

DESIGN STANDARDS ENGINEER

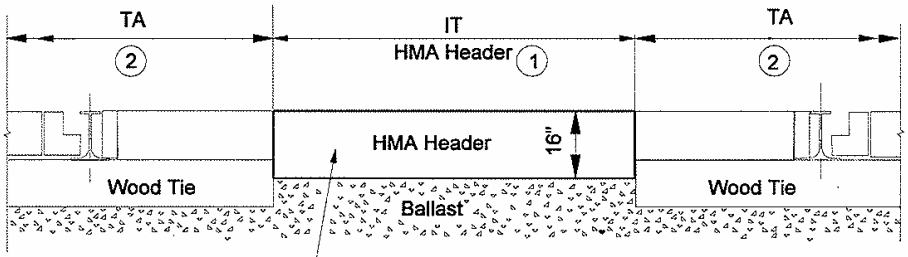
DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE



LEGEND:

IT - INTER TRACK HEADER
TA - track area
Terminal joint - see Standard Drawing E 609-RCBA-02



SECTION C - C

HMA Header Section : (5)
165# / syd HMA, Type_, Surface on
330# / syd HMA, Type_, Intermediate on
1265# / syd HMA, Type_, Base on
Subgrade treatment Type IV

NOTES :

(1) See Standard Drawing E 614-RRGC-04 for RC INTER TRACK HEADER.

(2) Construction between headers as indicated on the drawing to be executed by the railroad company in accordance with details as provided for in the crossing agreement.

(3) Teminal joint shall be used where RC Header abuts PCCP pavement.

4. See Standard Drawing E 614-RRGC-02 for the details of RC Header and Section B - B.

(5) The HMA Type_ shall match that of the adjoining asphalt pavement.
HMA Type_ shall be according to existing AADT when the adjoining pavement is PCCP.

INDIANA DEPARTMENT OF TRANSPORTATION

RAILROAD CROSSING DETAILS
HMA INTER TRACK HEADER

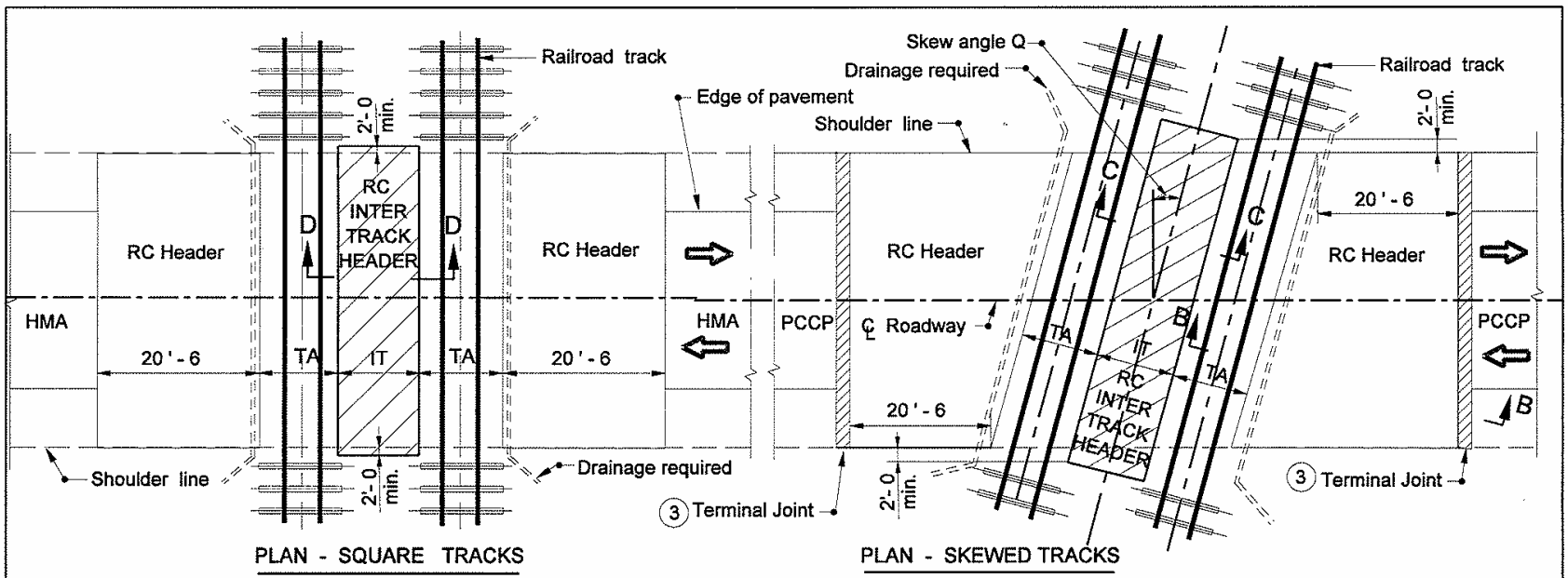
SEPTEMBER XXXX

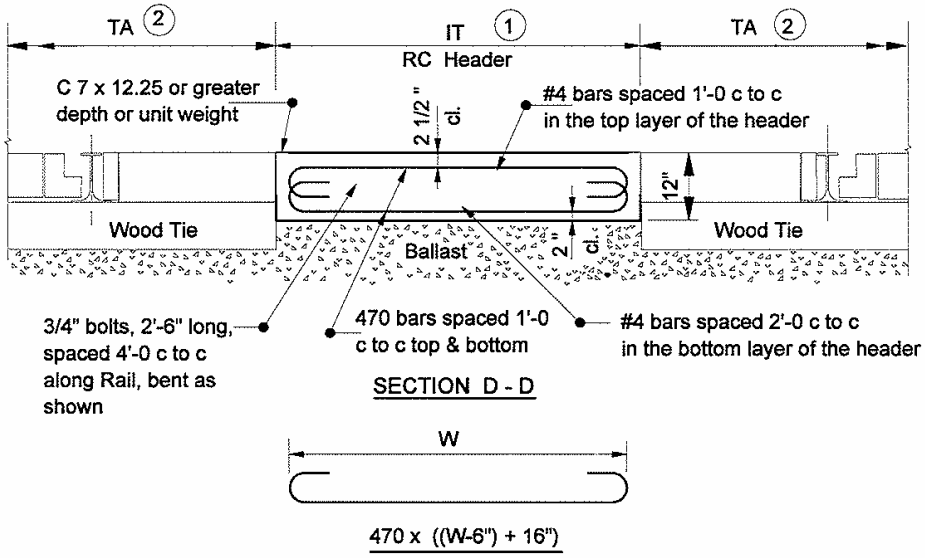
STANDARD DRAWING NO. E 614-RRGC-03

RICHARD L. VONCILE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE





SECTION D - D

470 x ((W-6") + 16")

NOTES :

1. See Standard Drawing E 614-RRGC-03 for details of HMA INTER TRACK HEADER.
2. Construction between headers as indicated on the drawing to be executed by the railroad company in accordance with details as provided for in the crossing agreement.
3. Teminal joint shall be used where RC Header abuts PCCP pavement.
4. See Standard Drawing E 614-RRGC-02 for details of RC Header and Section B - B.

INDIANA DEPARTMENT OF TRANSPORTATION

RAILROAD CROSSING DETAILS
RC INTER TRACK HEADER

SEPTEMBER XXXX

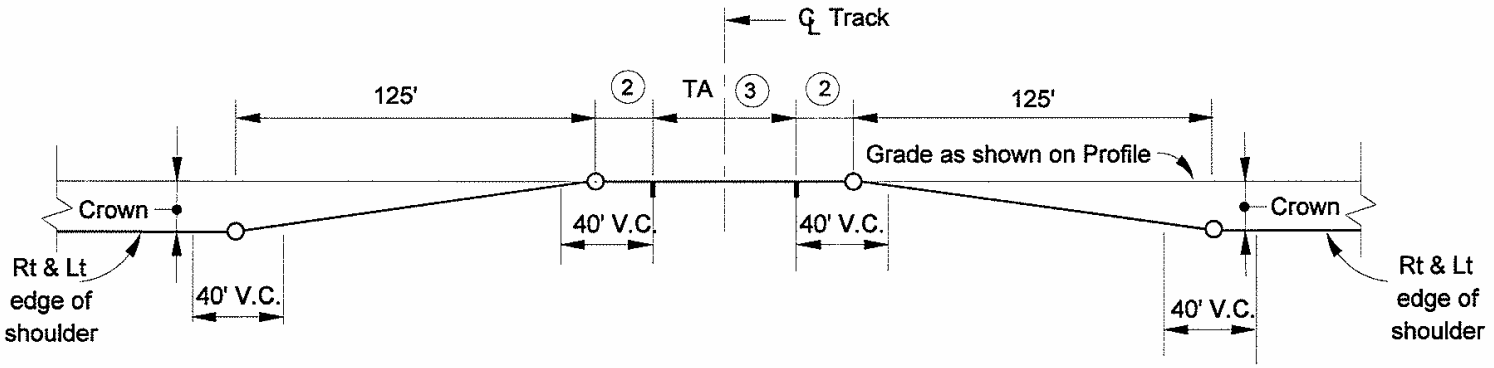
STANDARD DRAWING NO. E 614-RRGC-04

RICHARD L. VOIGHT REGISTERED NO. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE



NOTES :

1. Crown shall be taken out of pavement at each railroad crossing.
2. 20 ft or as required due to track skew.
3. TA is a track area to be constructed by railroad company.

INDIANA DEPARTMENT OF TRANSPORTATION

RAILROAD CROSSING DETAILS
CROWN-OUT DIAGRAM
SEPTEMBER 200X

STANDARD DRAWING NO. E 614-RRGC-05

ANTHONY L. UREMOVIC REGISTERED NO. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 614, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 614 – ~~CONCRETE~~ HEADERS

614.01 Description

This work shall consist of the construction or reconstruction of ~~PCC~~ headers adjacent to railroad tracks~~, bridges, and similar locations~~ in accordance with 105.03.

MATERIALS

614.02 Materials

Materials shall be in accordance with the following:

Concrete, *Class C* 702
Curing Materials *912.01*
Dense Graded Subbase *302*
HMA *402.02*
Reinforcing Steel, *Epoxy Coated* ..... 910.01*(b)9*

~~If the header is adjacent to cement concrete base or pavement, the header concrete shall be the same composition as that of the base or pavement header constructed monolithic with the base or pavement. If the adjacent base or pavement is thickened, that portion forming the thickening shall be considered as part of the header.~~

~~If the header is adjacent to asphalt pavement, the concrete shall be class A in accordance with 702 using class AP coarse aggregate.~~

CONSTRUCTION REQUIREMENTS

614.03 *General*

Construction of headers shall not begin until after the railroad has completed its work. Care shall be taken so as to not damage the railroad's work. The elevation of the headers shall match the elevation of the portion constructed by the railroad. Terminal joints shall be constructed in accordance with 503.

~~614.03~~ *614.04* PCC Header*s*

Construction shall be in accordance with the applicable provisions of ~~702~~ *302*, *609*, and ~~with~~ these requirements.

Welding shall be in accordance with 711.32.

~~Headers at railroad crossings shall be as shown on the plans.~~

614.05 ~~Method of Measurement~~ *HMA Headers*

Construction of HMA headers shall be in accordance with 402.

~~614.06 Reconstructed Cement Concrete Header~~

~~This work shall be in accordance with the plans. Round plug welds or rectangular shaped plug welds may be used to weld the steel angle to the existing steel edge protection. Round plug welds shall be a minimum of 1 in. (25 mm) diameter.~~

~~Welding shall be in accordance with 711.32.~~

~~614.05~~ *614.06* Method of Measurement

Cement concrete header ~~and reconstructed cement concrete header~~ will be measured by the ~~linear foot (meter)~~ *square yard (square meter). HMA surface, intermediate, and base will be measured by the ton (megagram) in accordance with 402.19. Dense graded subbase will be measured by the cubic yard (cubic meter) in accordance with 302.08. Terminal joints will be measured by the linear foot (meter) in accordance with 503.07.*

~~614.06~~ *614.07* Basis of Payment

~~The accepted quantities of this work~~ *Cement concrete headers* will be paid for at the contract unit price per ~~linear foot (meter)~~ *square yard (square meter)* for header, cement concrete~~, of the type specified, or header, cement concrete, reconstruct,~~ complete in place. *HMA surface, intermediate, and base will be paid for in accordance with 402.20. Dense graded subbase will be paid for in accordance with 302.09. Terminal joints will be paid for in accordance with 503.08.*

Payment will be made under:

Pay Item	Pay Unit Symbol
Header, Cement Concrete, ~~_____~~ ~~Type~~	~~LFT (m)~~ *SYS (m2)*
~~Header, Cement Concrete, Reconstruct~~	~~LFT (m)~~

The cost of *reinforcing steel,* edge protection, metal chairs, excavation, and necessary incidentals shall be included in the cost of ~~the pay items~~ *header, cement concrete or in the cost of the HMA surface, intermediate, and base.*

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:

See Item 18-13

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

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: **Railroad Headers**

REVISES: ***Indiana Design Manual*** **Section 17-3.01**

EFFECTIVE: **_____, 2007, Letting**

Details for both PCCP and HMA railroad headers and approach-roadway pavement-crown treatments have been standardized. The designer should contact the Production Management Division's Real Estate Office's railroads engineer to determine which pavement material should be used for each highway-railway grade crossing's headers.

If HMA headers are to be used with HMA approach pavement, their HMA type should match that of the approach pavement. If HMA headers are to be used with PCC approach pavement, their HMA type should be determined from Figure 06-__A, HMA Types for Railroad Headers, and shown on the plans.

Construction-Year AADT	HMA Type
< 200	A
200 ≤ AADT < 2000	B
2000 ≤ AADT < 7000	C
≥ 7000	D

HMA TYPES FOR RAILROAD HEADERS

Figure 06-__A

Pavement-materials quantities for headers should be determined based on attached Recurring Special Provision 614-R-___. Pavement-materials quantities for HMA headers should be incorporated into the project's total HMA pavement quantities. The new pay item for concrete header is 614-_____, Header, Cement Concrete, pay unit square yard (square meter).

Recurring Special Provision 614-R-___, and Recurring Plan Detail 614-R-___d, both attached hereto, should be called for beginning with the _____, 2007, letting, and through the _____, 2007, letting. Beginning with the September __, 2007, letting, the recurring special provision 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. 18-15
Ms. Rearick
Date: 03/15/07

REVISION TO STANDARD DRAWINGS

707-BEBP-01, Elastomeric Bearing Pads, Type 1 & 2
707-BEBP-02, Elastomeric Bearing Pads, Type 3 & 4
707-BEBP-03, Elastomeric Bearing Pads, Type 5, 6 & 7

The revisions removes a conflict between the Standard Drawings and the Specifications.

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:

726-B-044

Standard Sheets potentially affected:

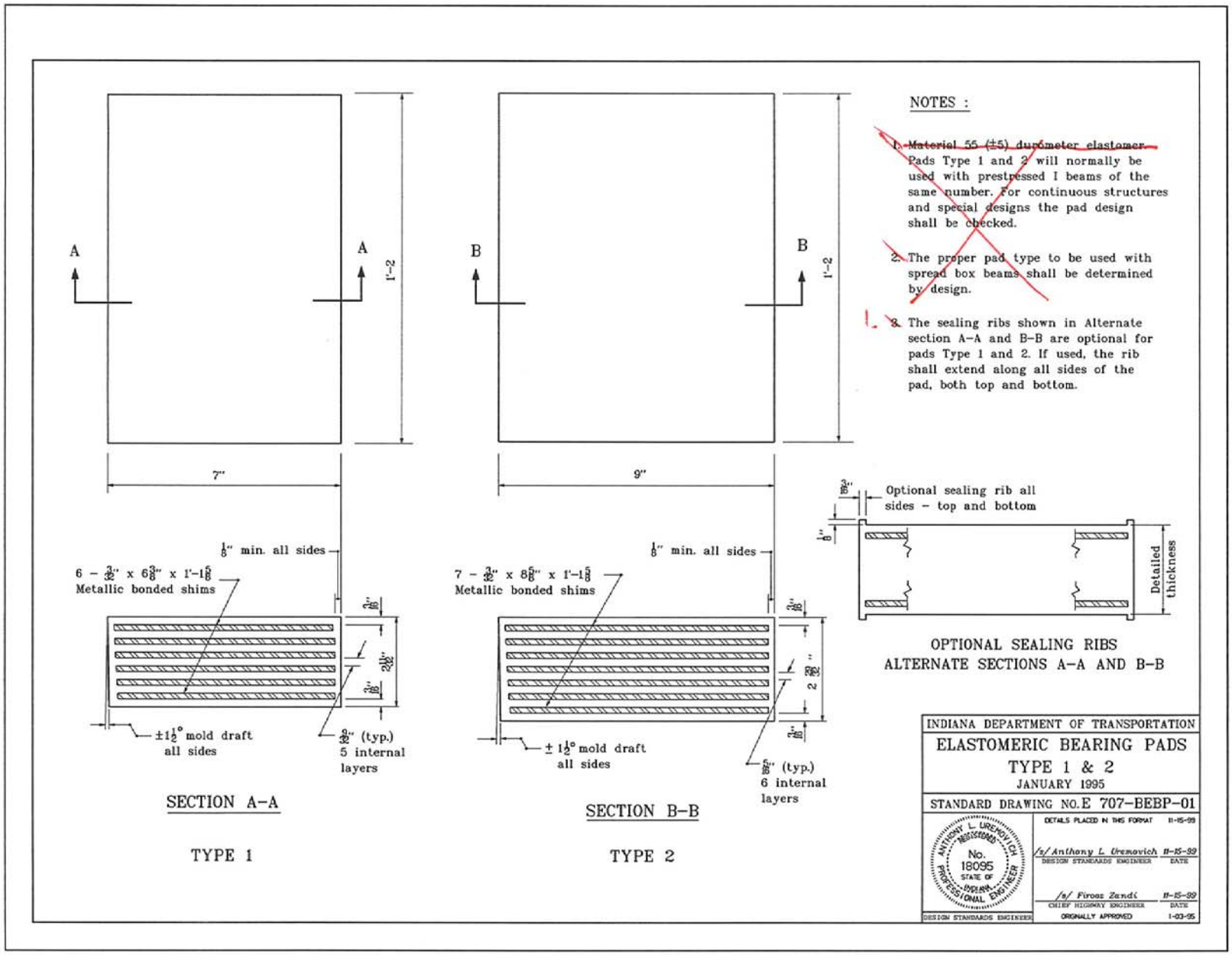
See Above

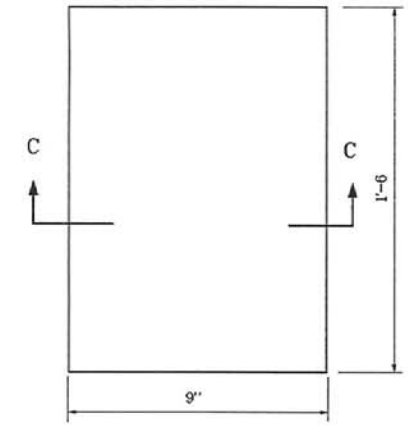
Motion: M
Second: M
Ayes:
Nays:

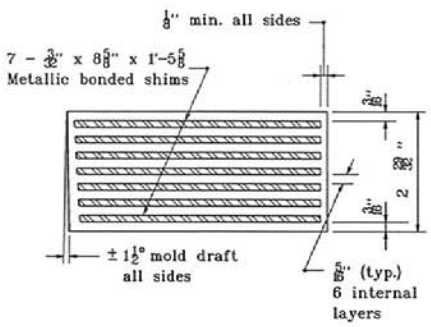
Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

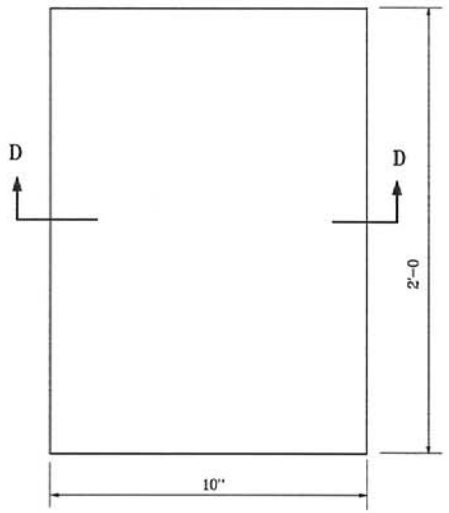
Received FHWA Approval? ____

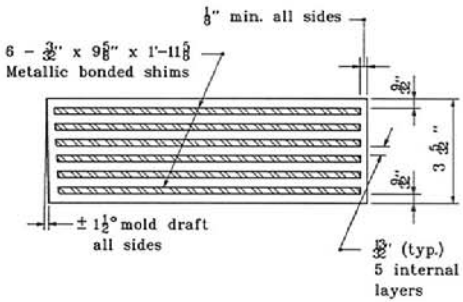

A
A
1'-2
7"
1/8" min. all sides
6 – 3/32" x 6 3/8" x 1'-1 5/8
Metallic bonded shims
3/16"
2 1/2"
3/16"
±1 1/2° mold draft
all sides
3/32" (typ.)
5 internal
layers
SECTION A–A
TYPE 1
B
B
1'-2
9"
1/8" min. all sides
7 – 3/32" x 8 5/8" x 1'-1 5/8
Metallic bonded shims
3/16"
2 5/16"
3/16"
± 1 1/2° mold draft
all sides
5/32" (typ.)
6 internal
layers
SECTION B–B
TYPE 2
NOTES :
1. Material 55 (±5) durometer elastomer. Pads Type 1 and 2 will normally be used with prestressed I beams of the same number. For continuous structures and special designs the pad design shall be checked.
2. The proper pad type to be used with spread box beams shall be determined by design.
3. The sealing ribs shown in Alternate section A–A and B–B are optional for pads Type 1 and 2. If used, the rib shall extend along all sides of the pad, both top and bottom.
3/16"
Optional sealing rib all
sides – top and bottom
1/8"
Detailed
thickness
OPTIONAL SEALING RIBS
ALTERNATE SECTIONS A–A AND B–B
INDIANA DEPARTMENT OF TRANSPORTATION
ELASTOMERIC BEARING PADS
TYPE 1 & 2
JANUARY 1995
STANDARD DRAWING NO. E 707–BEBP–01
ANTHONY L. UREMOVICH
REGISTERED
No. 18095
STATE OF INDIANA
PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER
DETAILS PLACED IN THIS FORMAT 11-15-99
/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 1-03-95





SECTION C–C





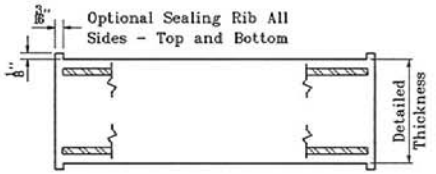
SECTION D–D

TYPE 3

TYPE 4

NOTES :

1. Material: 55 (±5) durometer elastomer. Pads Type 3 and 4 will normally be used with prestressed I beams of the same number. For continuous structures and special designs the pad design shall be checked.
2. The proper pad type to be used with spread box beams shall be determined by design.
3. The sealing ribs shown in Alternate Section C–C and D–D are optional for pads Type 3 and 4. If used, the rib shall extend along all sides of the pad both top and bottom.



OPTIONAL SEALING RIBS
ALTERNATE SECTIONS C–C AND D–D

INDIANA DEPARTMENT OF TRANSPORTATION

ELASTOMERIC BEARING PADS
TYPE 3 & 4
JANUARY 1995

STANDARD DRAWING NO. E 707–BEBP–02

ANTHONY L. UREMOVICH REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

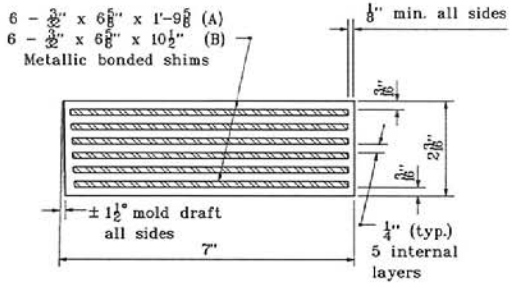
DESIGN STANDARDS ENGINEER

DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

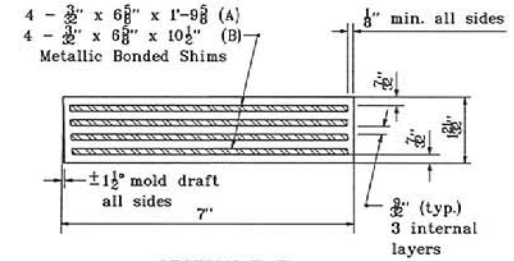
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

ORIGINALLY APPROVED 1-00-95



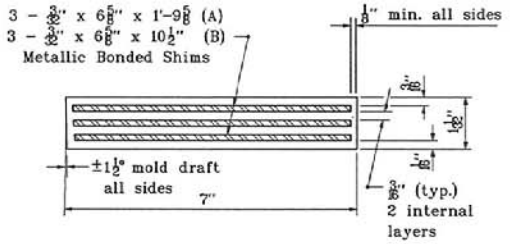
SECTION E–E

TYPE 5



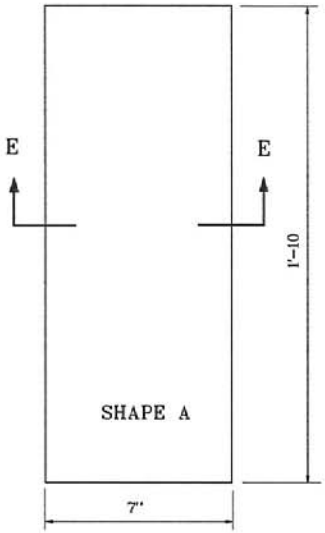
SECTION E–E

TYPE 6

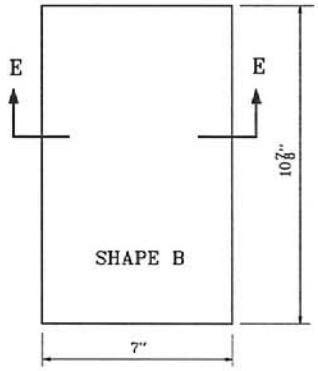


SECTION E–E

TYPE 7



TYPE 5A, 6A, & 7A



TYPE 5B, 6B, & 7B

NOTES :

1. Material: 55 (±5) durometer elastomer. Pads Type 5, 6, & 7 (shapes A & B) are to be used with prestressed box beams. Select type by suitable design. Use shape A under adjacent box beams and shape B under outside edge of exterior box beam. Pads to be designated as Type 5A, 5B, etc.
2. The proper pad type to be used with spread box beams shall be determined by design.

INDIANA DEPARTMENT OF TRANSPORTATION

ELASTOMERIC BEARING PADS
TYPE 5, 6 & 7
JANUARY 1995

STANDARD DRAWING NO.E 707-BEBP-03

ANTHONY L. UREMOVICH — No. 18095 — STATE OF INDIANA — PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER — DATE

/s/ Firoz Zaidi 11-15-99
CHIEF HIGHWAY ENGINEER — DATE

ORIGINALLY APPROVED 1-03-95

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 710, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 710 – *PATCHING CONCRETE STRUCTURES AND* REPOINTING MASONRY IN STRUCTURES

710.01 Description

This work ~~shall~~ consists of *patching concrete piers, endbents, abutments, wingwalls, retaining walls, concrete structure surfaces other than bridge decks, patching concrete drainage structures and* repointing ~~concrete~~, rubble, dressed stone, or brick masonry structures ~~with mortar~~ in accordance with 105.03.

Bridge deck patching shall be in accordance with 722.

710.02 Materials

Materials shall be in accordance with the following:

Coarse Aggregate, Class A or Higher, Size No. 11 .....*904*
Concrete, Class A.....*701.02*
Curing Compound.....*912.01*
Epoxy Resin Adhesive *909.11*
Fine Aggregate.....904.01
Hydrated Lime 913.04
Masonry Cement .....901.01(c)
Portland Cement.....901.01(b)
Reinforcing Steel.....*910.01*

CONSTRUCTION REQUIREMENTS

710.03 ~~Repointing Concrete Masonry~~ *Patching Concrete Structures*

~~All honeycombed, weathered, or disintegrated areas in the concrete shall be cut out and thoroughly cleaned of all loose concrete, dirt, or other foreign material to a depth and over the area necessary to produce a firm and solid connecting surface for the adherence of the new mortar. This prepared surface shall be coated with epoxy resin adhesive in accordance with AASHTO M 235, class I, filled with mortar well driven in, and finished to meet approval. Where the surface is to be cleaned out to such depth and area that the new mortar does not stay in place without support, a form shall be placed over the area and the space so enclosed filled with well-consolidated mortar. After the forms are removed the mortar shall be protected in accordance with 708.07.~~

(a) Concrete Removal

Areas of unsound concrete to be removed will be marked by the Engineer.

A saw cut shall be made perpendicular to the existing concrete surface a minimum of 1 in. (25 mm) outside marked areas. The cut shall be a minimum 1 in. (25 mm) deep or to the top of reinforcing steel, whichever is less.

Removal of unsound concrete shall not exceed 6 in. (150 mm) in depth and 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 chipping hammers 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 to concrete surfaces.

Where reinforcing steel has been exposed, 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 removal operations. Reinforcing steel damaged by the Contractor shall be replaced.

Regardless of the method of removal, removal operations shall cease if sound concrete is being removed beyond the limits approved by the Engineer. Removal methods shall be adjusted to prevent unnecessary removal of sound concrete prior to resuming removal operations.

(b) Replacement of Reinforcing Steel

Existing reinforcing steel that has lost 50% or more of its original cross sectional area shall be removed and replaced with new reinforcing steel of the diameter of the original steel. Replacement reinforcing steel shall be lapped a minimum of 3 in. (75 mm) along existing reinforcing steel.

(c) Patching

After concrete removal operations are completed and just prior to placing patches, all patch areas shall be sandblasted to expose aggregates in concrete surfaces and to remove rust, residual concrete and laitance layers from reinforcing steel surfaces. All surfaces shall be free of dust, chips, water and foreign material to produce a firm, solid surface for adherence of patching concrete. Air lines for sandblasting and air cleaning shall be equipped with oil and water traps.

Surfaces of prepared cavities and all exposed reinforcing steel within the cavities shall be coated with epoxy resin adhesive in accordance with 722.06(a)1.

For patched areas that require forms, forms may be removed after 24 hr and surfaces cured in accordance with 702.22 or the forms may be left in place for 72 hr and no additional curing will be required. Patched areas that do not require forms shall be cured in accordance with 702.22.

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

710.04 Repointing Rubble Masonry

Joints in rubble masonry shall be cleaned of all loose mortar and foreign material. All spaces around the rubble aggregate, after being cleaned, shall be ~~well~~ filled with mortar *and trowel finished*. ~~If any of the~~ *All loose* rubble ~~is loose, it~~ shall be settled into place before the mortar has set.

710.05 Repointing Dressed Stone and Brick Masonry

~~The joints~~ *Joints* in ~~the~~ masonry shall be cleaned of all loose mortar and foreign material for a depth of at least twice the width of the joint. ~~The joints~~ *Joints* shall ~~then~~ be filled with mortar ~~well driven in~~ and ~~neatly~~ *trowel* finished.

710.06 Method of Measurement

~~Repointing~~ *Patching concrete structures and repointing rubble, dressed stone and brick* masonry in structures will be measured by the square foot (square meter) of actual surface area of ~~masonry repointed~~ *patching or repointing*. Individual ~~patches~~ *areas* of less than 1 ~~sq~~ ft^2 (0.1 m^2) in area will be considered as 1 ~~sq~~ ft^2 (0.1 m^2). *Areas greater than 1 ft^2 (0.1 m^2) will be recorded as the actual measurement of the repaired area to the nearest 0.1 ft^2 (0.01 m^2).*

710.07 Basis of Payment

The accepted quantities of ~~repointing~~ *patching concrete structures will be paid for at the contract unit price per square foot (square meter) complete in place. Repointing rubble, dressed stone, and brick* masonry in structures will be paid for at the contract unit price per square foot (square meter) of ~~repointed~~ *repointing* masonry complete in place.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
Patching Concrete Structures	*SFT (m2)*
Repointing Masonry in Structures	SFT (m2)

Areas where *patching concrete structures or* repointing *rubble, dressed stone, or brick* masonry in structures exceeds an average of 4 in. (100 mm) in depth~~, the work shall be completed as extra work~~ *will be paid for at a price calculated by multiplying the contract unit price by 1.25*. ~~Payment will be made in accordance with 104.03.~~

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

The cost of replacing damaged reinforcing steel shall be included in the cost of patching concrete structures.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 710, CONTINUED.

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:

206-B-113
729-B-009

Standard Sheets potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 722, BEGIN LINE 105, DELETE AND INSERT AS FOLLOWS:

2. Bridge Floor

Following the clean up from the surface removal operation, areas of unsound concrete to be removed will be marked. Removal of the unsound concrete shall be performed by handchipping or hydrodemolition. 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~~ *chipping hammers* 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 bridge floor surface.

SECTION 722, BEGIN LINE 128, INSERT AS FOLLOWS:

Where *reinforcing steel has been exposed or* 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. If the concrete is unsound down to the top layer of bottom reinforcing steel, all of the concrete within the marked area shall be removed and the cavity shall require full depth patching in accordance with 722.06(a). Prepared cavities which are deeper than the level of the adjacent prepared deck surface, but are not full depth, shall require partial depth patching in accordance with 722.06(b). Prepared partial depth cavities shall be made full depth when directed. Exposed reinforcing steel shall not be damaged by the removal operation. Any damaged reinforcing steel shall be repaired as directed with no additional payment.

SECTION 722, BEGIN LINE 146, DELETE AND INSERT AS FOLLOWS:

(b) Cleaning

After the concrete removal operation is completed and just prior to placing the *patches or the* overlay, the entire deck 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, ~~and~~ 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.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 722, CONTINUED.

Other sections containing specific cross references:

202.03(b), Pg 200-8
722.07, Pg 700-141
722.13(d), Pg 700-146

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: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standards Edition

Withdrawn ____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 801, BEGIN LINE 311, DELETE AND INSERT AS FOLLOWS:

801.10 Temporary Traffic Barriers

Temporary traffic barrier shall be one of the following four types as shown on the plans.

Type 1

Type 1 temporary traffic barriers shall be used to separate two-way traffic and shall be precast concrete in accordance with applicable requirements of 707 and 602 and as shown on the plans. Type 1 barriers may also be used to separate traffic from the work zone. The surfaces of individual precast units shall vary no more than 0.25 in. (6 mm) in 10 ft (3 m) from the specified cross section, as measured from a longitudinal straightedge. The maximum variation in the vertical and horizontal alignment of adjacent units shall be 0.25 in. (6 mm) across the joint, as measured from a 10 ft (3 m) longitudinal straightedge. Sections that have obvious defects or visual cracks shall not be used. Sections that develop any of these conditions during the contract shall be repaired with concrete or replaced within a reasonable amount of time.

Type 1 barrier units precast prior to 2003 shall not be used after January 1, 2012. Units precast after March 1, 2003 shall be clearly marked with the name or trademark of the manufacturer, the year of manufacture, and "INDOT". The markings shall be indented on an end or on the top of each barrier section. ~~Units precast prior to 2003 shall not be used after January 1, 2012.~~ *Units precast after January 1, 2007 shall be from the Department's list of Certified Precast Concrete Producers.*

Other sections containing specific cross references:

801.10(e), Pg 800-10

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:

801-T-163

Standard Sheets potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
____ 2008 Standards Specifications Book
____ 2008 Standard Edition

Withdrawn ____

Received FHWA Approval? ____