INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING

Driving Indiana's Economic Growth

AGENDA

June 18, 2009 Standards Committee Meeting

MEMORANDUM

June 01, 2009

TO: Standards Committee

FROM: Mike Milligan, Secretary

RE: Agenda for the June 18, 2009 Standards Committee Meeting

A Standards Committee meeting is scheduled for 9:00 a.m. on June 18, 2009 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.

Page No.

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. Approval of May 21, 2009 Minutes

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. Complete Rewrite on the Indiana Design Manual 3

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

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

Item No.01 06/18/09 (2010 SS)	Mr. Wright	4
Standard Drawings	615-SMON-01 thru 04	
615.04	Monuments	
615.09	Setting Monuments	
615.13	Method of Measurement	
615.14	Basis of Payment	
Item No.02 06/18/09 (2010 SS)	Ms. Rearick	14
Standard Drawing	707-BPBB-01	
707-B-xxx	ADJACENT PRESTRESSED-CONCRETE BOX BEAMS	

cc: Committee Members (11)
FHWA (2)

Mr. Wright
Date: 06/18/09

CONCEPTUAL PROPOSAL

1. Complete Rewrite on the Indiana Design Manual.

CONCEPTUAL

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Complete Rewrite on the Indiana Design Manual
Problem - Lack of Design Flexibility and Design Manual too large to maintain

PROPOSED SOLUTION: Complete Rewrite

APPLICABLE STANDARD SPECIFICATIONS: Unknown at this time

APPLICABLE STANDARD DRAWINGS: unknown at this time

APPLICABLE DESIGN MANUAL SECTION: All Chapters, except Chap. 52

APPLICABLE SECTION OF GIFE: unknown at this time

APPLICABLE RECURRING SPECIAL PROVISIONS: Unknown at this time

Submitted By: John Wright

Title: Manager of Roadway Services

Organization: INDOT

Phone Number: 232-5147

Date: 5/21/09

APPLICABLE SUB-COMMITTEE ENDORSEMENT? Yes, there will be 13 focus teams dividing up the Manual. Each focus team has INDOT Reps (both CO and District), Design Consultants and FHWA.

The focus teams are as follows;
1) Project Administration and Plan Development Procedures
2) Utility and Railroad Coordination
3) Hydrology and Hydraulics
4) Roadway Geometrics
5) Roadway Design Components
6) Structure Size & Type
7) Superstructure - Steel Structures and Other Structures
8) Superstructure - Reinforced Concrete Structures
9) Substructure Structural Elements and Retaining Walls
10) Bridge Rehabilitation
11) Traffic Design
12) Special Design Elements
13) Contract Delivery

The Rewrite time frame has been set at 2 years for completion. Chapters will be developed and implemented as completed.

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The Standard Specifications and Standard Drawings are contradictory regarding survey-monument-pin material.

The standard documents are silent regarding placement, method of measurement, and basis of payment for a "Survey Monument INDOT" sign, now detailed in the Standard Drawings.

The Standard Specifications regarding monuments have misplaced and twice-referenced requirements in the Materials and Construction Requirements sections.

The Standard Drawings regarding monuments require editorial corrections for consistency and clarity.

PROPOSED SOLUTION: Identify the monument-pin material only in the Standard Specifications. Develop a new standard drawing showing placement requirements for the "Survey Monument INDOT" sign. Move, delete, add materials-related and construction-related requirements in the proper Standard Specifications sections as required. Include method-of-measurement and basis-of-payment requirements for the survey-monument sign in the Standard Specifications. Develop a technical advisory which indicates to designers that the sign requirement should be shown on the plans. Show editorial corrections on all monument-related Standard Drawings. Re-identify them as one 615-SMON series.

APPLICABLE STANDARD SPECIFICATIONS: 615.04, 615.09, 615.14

APPLICABLE STANDARD DRAWINGS:
Current 615-SLMN-01 becomes new 615-SMON-01
The survey-monument-sign placement details become new 615-SMON-02
Current 615-SCMN-01 becomes new 615-SMON-03
Current 615-SLBM-01 becomes new 615-SMON-04.

APPLICABLE DESIGN MANUAL SECTION: 17-4.09(03)

APPLICABLE SECTION OF GIFE: Unknown

Submitted By: John Wright

Title: Manager, Office of Roadway Services

Organization: INDOT

Phone Number: 232-5147

Date: 3-17-09

Item No. 01 06/18/09 (2010 SS)
Mr. Wright
Date: 06/18/09

PROPOSED NEW STANDARD DRAWINGS

615-SMON-01 Survey-Line Monument
615-SMON-02 Survey-Monument Sign
615-SMON-03 Section-Corner Monument
615-SMON-04 Bench Mark Post

Other sections containing specific cross references:

Recurring Special Provisions affected:

Standard Sheets affected:

615-SMON-1
615-SMON-2
615-SMON-3
615-SMON-4

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised

___ 20__ Standard Specifications Book

___ Create RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

___ Revise RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

Standard Drawing Effective _____

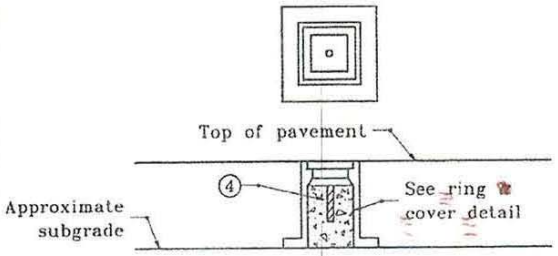
___ Create RPD (No. _____)
Effective _____Letting
___ Technical Advisory

GIFE Update Req'd.? Y___ N___
By - Addition or Revision

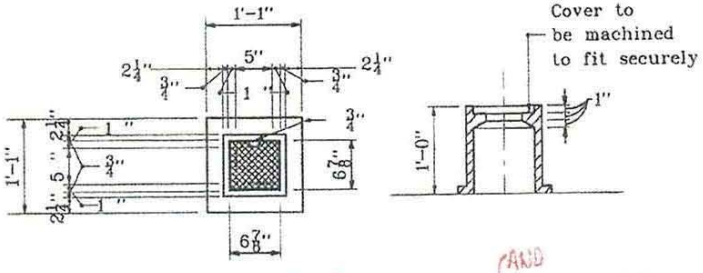
Frequency Manual Update Req'd? Y___ N___
By - Addition or Revision

Withdrawn ____

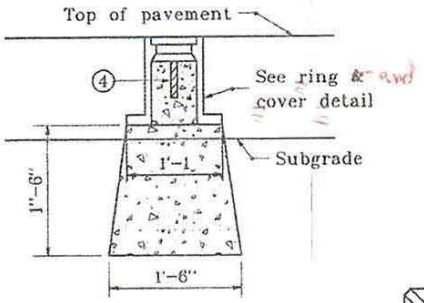
Received FHWA Approval? ____



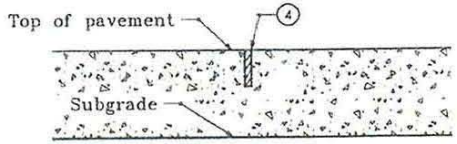
INSTALLATION FOR VITRIFIED BRICK OR BITUMINOUS SURFACE ON CONCRETE BASE (TYPE A)



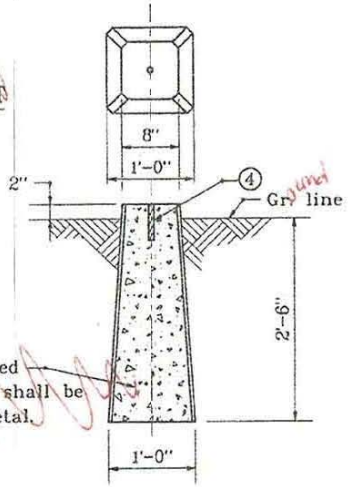
SURVEY LINE MONUMENT RING & COVER



INSTALLATION FOR FLEXIBLE PAVEMENT (TYPE B)

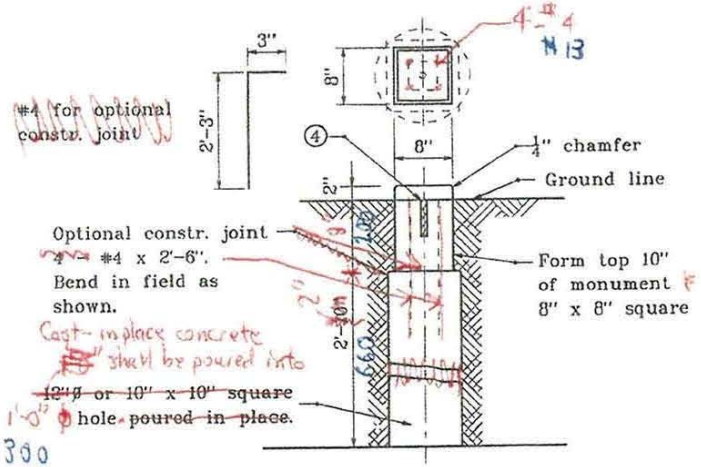


INSTALLATION FOR CONCRETE PAVEMENT (TYPE D)



Where monument is required inside of surfaced area it shall be set with the top below metal.

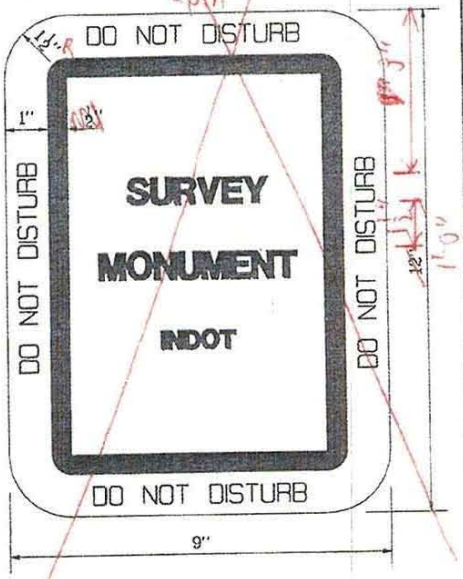
INSTALLATION OUTSIDE OF PAVEMENT (TYPE C)



OPTIONAL INSTALLATION FOR TYPE C MONUMENT

GENERAL NOTES

1. Sign shall be white background with black copy.
2. One ~~steel~~ type A or 4" x 4" wood post required.
3. Letter height shall be as follows:
   Border: 2" series D
   Line 1: 1" series B
   Line 2: 1" series B
   Line 3: 1" series B
4. 1"Ø x 5" ~~steel rod~~



INDIANA DEPARTMENT OF TRANSPORTATION

SURVEY LINE MONUMENTS

SEPTEMBER 1997

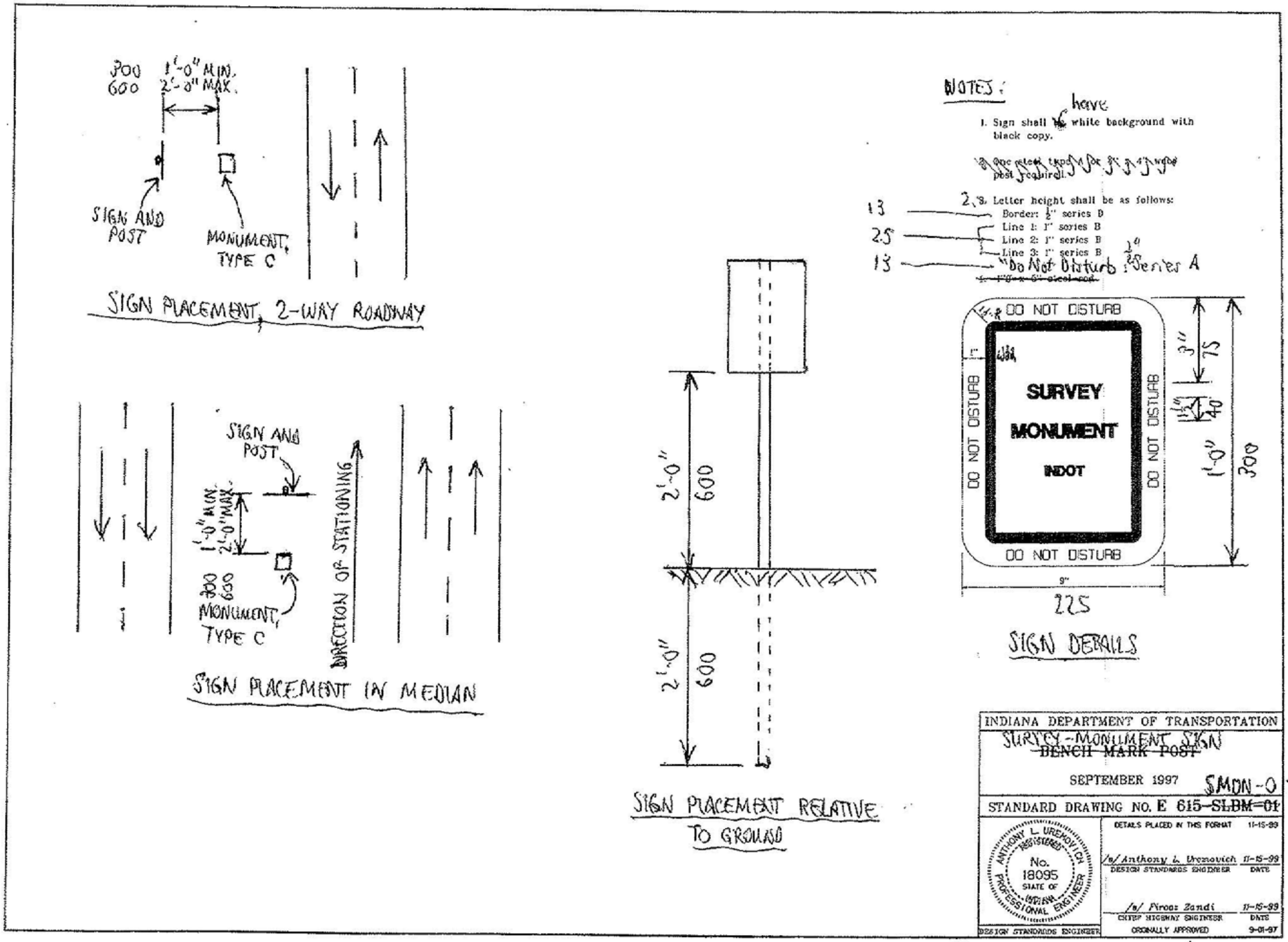
STANDARD DRAWING NO. E 615-SLMN-01

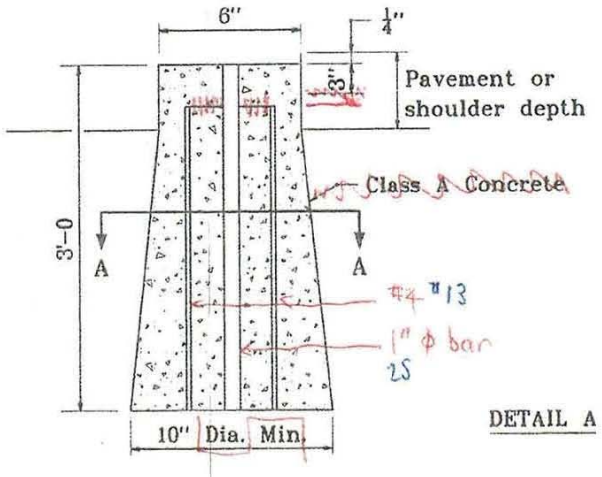
ANTHONY L. UREMOVICH REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

DETAILS PLACED IN THIS FORMAT 11-15-99

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

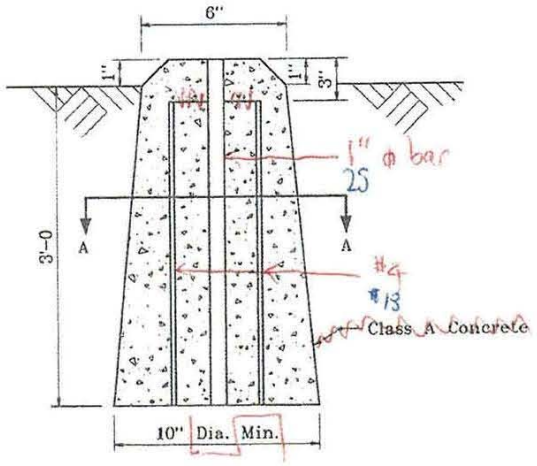
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 9-01-97


NOTES:
1. Sign shall have white background with black copy.
2. Letter height shall be as follows:
Border: ½" series D
Line 1: 1" series B
Line 2: 1" series B
Line 3: 1" series B
"Do Not Disturb" ½" Series A
13
25
13
DO NOT DISTURB
SURVEY
MONUMENT
INDOT
9"
225
3"
75
40
1'-0"
300
SIGN DETAILS
2'-0"
600
2'-0"
600
SIGN PLACEMENT RELATIVE TO GROUND
300
600
1'-0" MIN.
2'-0" MAX.
SIGN AND POST
MONUMENT, TYPE C
SIGN PLACEMENT, 2-WAY ROADWAY
SIGN AND POST
1'-0" MIN.
2'-0" MAX.
300
600
MONUMENT, TYPE C
DIRECTION OF STATIONING
SIGN PLACEMENT IN MEDIAN
INDIANA DEPARTMENT OF TRANSPORTATION
SURVEY-MONUMENT SIGN
BENCH MARK POST
SEPTEMBER 1997
SMON-02
STANDARD DRAWING NO. E 615-SLBM-01
DETAILS PLACED IN THIS FORMAT 11-15-99
/s/ Anthony L. Urenovich 11-15-99
DESIGN STANDARDS ENGINEER DATE
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE
ORIGINALLY APPROVED 9-01-97
DESIGN STANDARDS ENGINEER
ANTHONY L. UREMOVICH
REGISTERED
No. 18095
STATE OF INDIANA
PROFESSIONAL ENGINEER



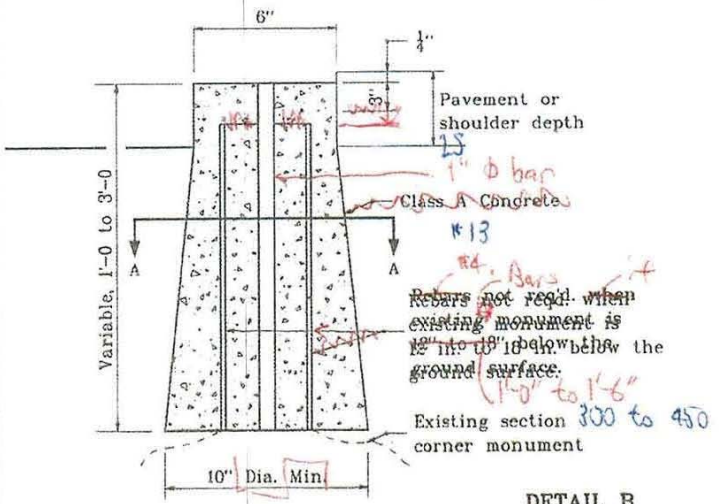
DETAIL A

INSIDE PAVEMENT OR SHOULDER AREA



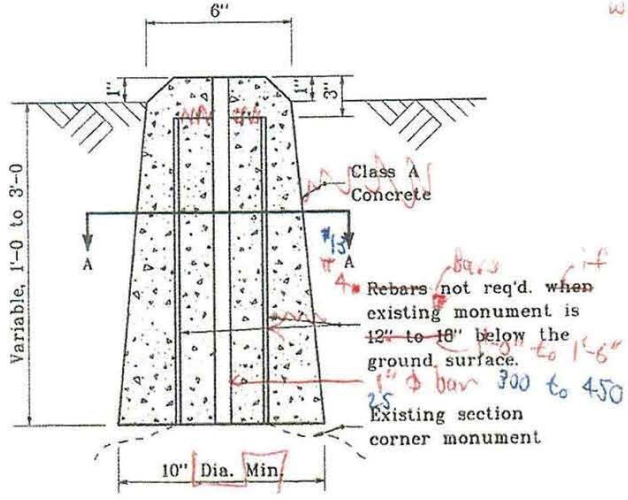
OUTSIDE PAVEMENT OR SHOULDER AREA

NEW SECTION CORNER MONUMENT INSTALLATION



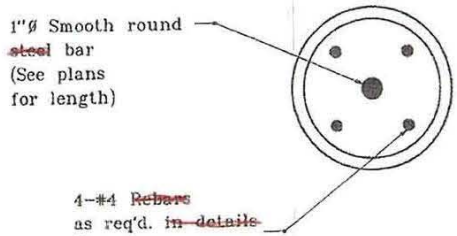
DETAIL B

INSIDE PAVEMENT OR SHOULDER AREA



OUTSIDE PAVEMENT OR SHOULDER AREA

EXTENSION OF EXISTING SECTION CORNER MONUMENT



SECTION A-A

NOTES

1. If the existing section corner monument is 0 to 1 ft below the surface, it shall be removed and replaced as shown in Detail A.

2. If the existing section corner monument is over 1 ft to 3 ft below the surface, the county surveyor shall determine whether it shall remain in place or be replaced. If the monument is to be replaced, the installation shall be as shown in Detail A. If the existing monument is to remain in place, it shall be extended as shown in Detail A.

INDIANA DEPARTMENT OF TRANSPORTATION

SECTION CORNER MONUMENTS

APRIL 1995

STANDARD DRAWING NO. E 615-SCMN-01

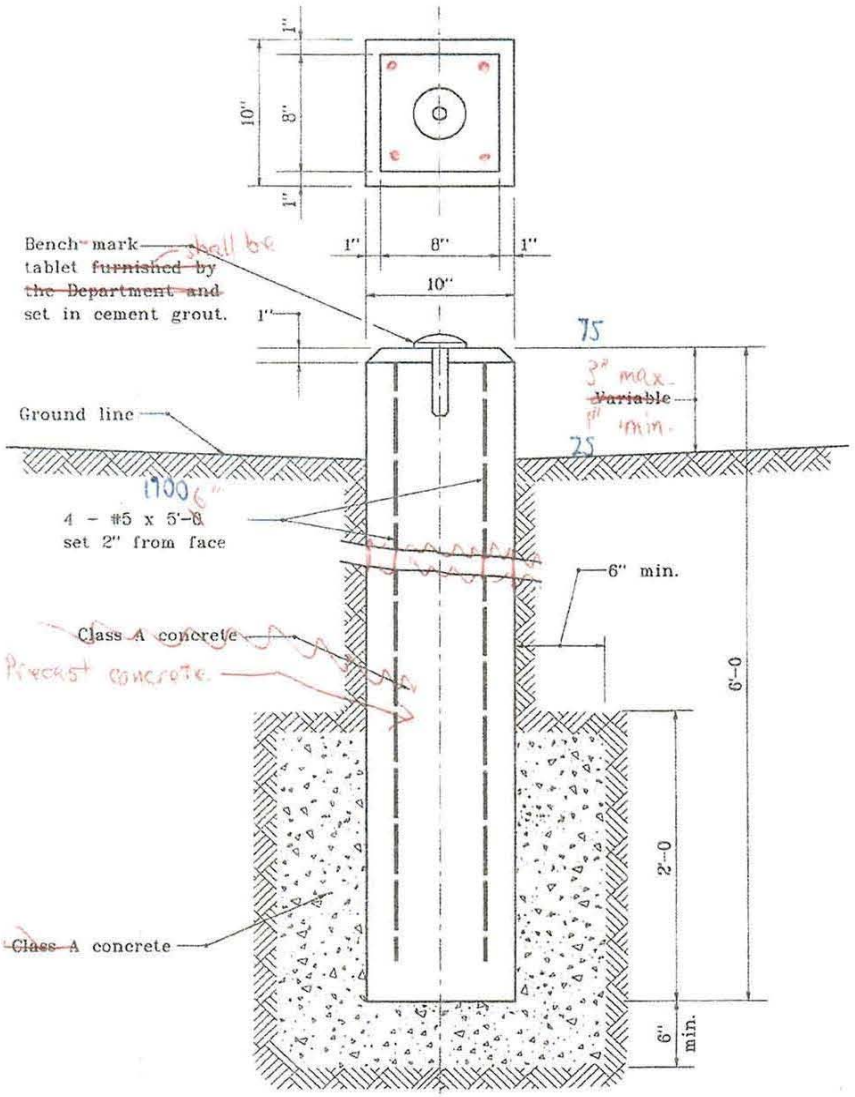
ANTHONY L. UREMOVICH REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

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 4-03-95



BENCH MARK POST

INDIANA DEPARTMENT OF TRANSPORTATION

BENCH ~~MARK~~ POST

SEPTEMBER 1997 SMON-014

STANDARD DRAWING NO. E 615-~~SLBM-01~~

DETAILS PLACED IN THIS FORMAT 11-15-99

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

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

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

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 9-01-97

REVISION TO 2010 STANDARD SPECIFICATIONS

SECTION 615, BEGIN LINE 45, DELETE AND INSERT AS FOLLOWS:

615.04 Monuments

~~Monuments shall be of the type specified in the Proposal book, the details of which are shown on the plans. Any portion extending above the ground shall be finished in accordance with 702.21.~~

Where concrete is required, it shall be class A in accordance with 702. ~~When placed in the forms it shall be tamped in layers until mortar covers the outer surface. The tops of the monument shall be floated smooth. Monuments may be cast in place or cast outside and then set.~~

~~The pin shall be set perpendicular to and flush with the top of the monument while the concrete is plastic and left undisturbed until the concrete has set.~~ The pin shall be ~~copper~~ *steel in accordance with 910.01(b)10.* ~~and shall be 1 in. (25 mm) in diameter and 5 in. (125 mm) long. If for type D monuments, the hole shall be drilled in the center with a 1/8 in. (3 mm) drill for a depth of 1.5 in. (38 mm). The hole shall be filled with lead flush with the end of the pin. Castings for protected monuments~~ *Monument rings and covers* shall be in accordance with 910.05(a).

The backing material for "Survey Monument INDOT" signs shall be in accordance with 919.01(a)1. Sheeting shall be in accordance with 919.01(b)2. The posts shall be type A in accordance with 910.14(a), or wood in accordance with 911.02(e).

SECTION 615, BEGIN LINE 99, DELETE AND INSERT AS FOLLOWS:

615.09 Setting Monuments

A monument may be precast or cast in place, then set. Once concrete is placed in the forms, it shall be tamped in layers until mortar covers the outer surface. The top of the monument shall be floated smooth. The portion extending above the ground shall be finished in accordance with 702.21.

The pin shall be set perpendicular to and flush with the top of the monument while the monument or pavement concrete is plastic. The pin shall be left undisturbed until the concrete has set.

~~If the location of a monument falls within the limits of a cement concrete pavement, a copper pin, the details of which are shown on the plans, shall be set perpendicular to and flush with the top of the finished pavement. It shall be placed just before the concrete takes initial set and then left undisturbed until the concrete has set. Other monuments shall be of the type shown on the plans, depending on the type or surface of the pavement in which they are to be placed or if they are to be placed outside of pavement.~~ Necessary excavation shall be to the required depth. The bottom of the excavation shall be firm and true to *the* line and grades ~~given~~ *shown on the plans*. After a monument is in place, the remaining excavated areas shall be backfilled with suitable material firmly tamped in layers. The monument shall not be disturbed.

REVISION TO 2010 STANDARD SPECIFICATIONS

SECTION 615, BEGIN LINE 153, INSERT AS FOLLOWS:

615.13 Method of Measurement

Right-of-way markers, reset right-of-way markers, monuments, re-established monuments, castings adjusted to grade monuments, bench mark posts, and reset bench mark posts will be measured by the number of units installed. Parking barriers will be measured by the number of units installed. *"Survey Monument INDOT" signs and posts will not be measured for payment.*

SECTION 615, BEGIN LINE 159, DELETE AND INSERT AS FOLLOWS:

615.14 Basis of Payment

The acceptable quantities of right-of-way markers, reset right-of-way markers, monuments, re-established monuments, ~~castings~~ *monument rings and covers* adjusted to grade ~~monuments~~, bench mark posts, ~~and~~ reset bench mark posts, and parking barriers will be paid for at the contract unit price per each complete in place.

SECTION 615, BEGIN LINE 179, INSERT AS FOLLOWS:

The cost of setting tablets in structures or bench mark posts, extensions for monuments, adjustment castings, re-establishing disturbed existing monuments, *"Survey Monument INDOT" signs and posts*, and other necessary incidentals shall be included in the cost of the pay items.

REVISION TO 2010 STANDARD SPECIFICATIONS

SECTION 615, CONTINUED.

Other sections containing specific cross references:

None

Recurring Special Provisions affected:

Standard Sheets affected:

615-SMON-01
615-SMON-02
615-SMON-03
615-SMON-04

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised

___ 20__ Standard Specifications Book

___ Create RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

___ Revise RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

Standard Drawing Effective _____

___ Create RPD (No. _____)
Effective _____Letting
___ Technical Advisory

GIFE Update Req'd.? Y___ N___
By - Addition or Revision

Frequency Manual Update Req'd? Y___ N___
By - Addition or Revision

Withdrawn ____

Received FHWA Approval? ____

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. 09-__
Technical Advisory

March 17, 2009 DRAFT

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

FROM: **_____**
Anthony L. Uremovich
Design Resources Engineer
Production Management Division

SUBJECT **Survey-Line Monuments**

REVISES: ***Indiana Design Manual*** **Section 17-4.09(03)**

EFFECTIVE: **_____, Letting**

Survey-line monument type C will require a "Survey Monument INDOT" sign to be placed near the monument. The sign and placement details are shown on the INDOT *Standard Drawings*. The identification to be shown on the Plan and Profile sheet should read, *Monument Type C and Survey-Monument Sign Required*. If monument types and locations are summarized in a table, the requirement for the sign should be included.

No pay item is required, as payment for the sign is included in that for the monument.

alu

SPECIFICATION REVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Design Manual Figure 63-8C for Adjacent Box Beam Details is considered to be a standard detail.

PROPOSED SOLUTION: Make this design manual figure into a standard drawing and take the specification-type notes off of this drawing and insert them into the SS.

APPLICABLE STANDARD SPECIFICATIONS: 707

APPLICABLE STANDARD DRAWINGS: new 707 drawing (707-BPBB-01)

APPLICABLE DESIGN MANUAL SECTION: chapter 63

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: New 707 RSP needs to be created

Submitted By: Anne Rearick

Title: Manager, Office of Structural Services

Organization: INDOT

Phone Number: 2-5152

Date: May 13, 2009

APPLICABLE SUB-COMMITTEE ENDORSEMENT? None. Change considered to be minor.

Item No. 01 06/18/09 (2010 SS)
Mr. Wright
Date: 06/18/09

PROPOSED NEW STANDARD DRAWING

707-BPBB-01 Adjacent Prestressed Concrete Box Beam Details

Other sections containing specific cross references:

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised

Recurring Special Provisions affected:

___ 20__ Standard Specifications Book

___ Create RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

___ Revise RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

Standard Sheets affected:

Standard Drawing Effective _____

___ Create RPD (No. _____)
Effective _____Letting
___ Technical Advisory

GIFE Update Req'd.? Y___ N___
By - Addition or Revision

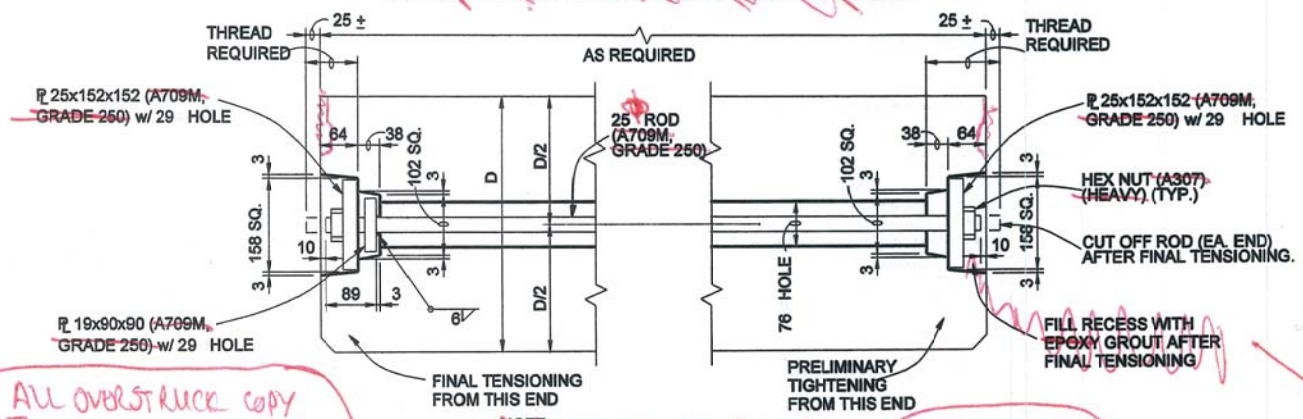
Frequency Manual Update Req'd? Y___ N___
By - Addition or Revision

Withdrawn ____

Received FHWA Approval? ____

TO STD SPEC – CONST.

TRANSVERSE TENSIONING RODS: AFTER THE BEAMS ARE IN PLACE, PERFORM A PRELIMINARY TIGHTENING TO THE TRANSVERSE TENSIONING RODS. PERFORM FINAL TENSIONING THAT YIELDS 138 MPa AS DEVELOPED BY A TORQUE OF 271 N·m. PROVIDE TRANSVERSE TENSIONING RODS AND PLATES CONFORMING TO ASTM A709M GRADE 250 WITH HEAVY HEX NUTS CONFORMING TO ASTIM A307.



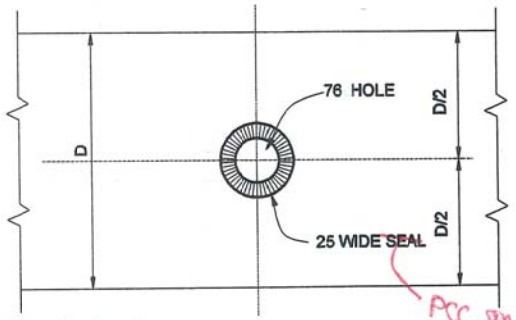
ALL OVERSTRUCK COPY TO STD SPEC – MATLS

NOTE:
FINAL TENSIONING SHALL YIELD 138 MPa AS DEVELOPED BY A TORQUE OF 271 N·m.

DUPLICATED IN NOTE ABOVE

TO STD SPEC – CONST.

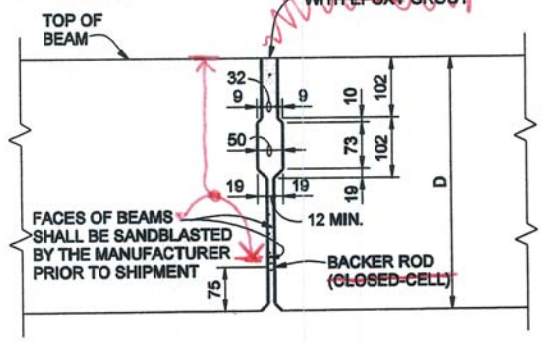
SECTION SHOWING TRANSVERSE TENSIONING ROD



NOTE:
SEAL TO BE PLACED ON EACH FACE ON BEAM AT HOLE LOCATION

SECTION AT FACE OF BEAM

PCC SEALER/HEALER



SECTION SHOWING JOINT BETWEEN BEAMS

ADJACENT BOX BEAM DETAILS

~~Figure 63-8C~~

TRANSVERSE TENSIONING ROD

TO NEW STD. DWG. 707-BP BB-01

BRIDGE PRESTRESSED BOX BEAM

PROPOSED RECURRING SPECIAL PROVISION

707-B-xxx ADJACENT PRESTRESSED-CONCRETE BOX BEAMS

(Adopted xx-xx-09)

The Standard Specifications are revised as follows:

SECTION 707, BEGIN LINE 10, INSERT AS FOLLOWS:

707.02 Materials

Materials shall be in accordance with the following:

Admixture for Concrete	912.03
Backer Rod	*906.02(b)*
Coarse Aggregates, Class A or Higher, Size No. 91	904
Concrete Curing Materials	912
Concrete Sealers	909.09, 909.10
Elastomeric Bearings	915.04
Fine Aggregates, Size No. 23	904
Fly Ash	901.02
PCC Sealer/Healer	*901.06*
Portland Cement	901.01(b)
Prestressing Strand	910.01(b)7
Reinforcing Bars	910.01

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(f), 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.

Tensioning rods and steel plates used with adjacent prestressed-concrete box beams shall be in accordance with ASTM A 706, Grade 36 (A 706M, Grade 250). Nuts used with such tensioning rods shall be heavy hex in accordance with ASTM A 563 (A 563M). Grout used with such beams shall be non-shrink in accordance with ASTM C 1107.

SECTION 707, AFTER LINE 364, INSERT AS FOLLOWS:

After adjacent prestressed-concrete box beams are in place, the transverse tensioning rods shall be preliminarily tightened where shown on the plans. The rods shall be final tensioned where shown on the plans. The final tensioning shall yield 20,000 psi (138 MPa) as developed by means of a torque of 19 lb-ft (271 N-m). The tensioning-rod recesses and longitudinal joints between beams shall be filled with grout.

PROPOSED RECURRING SPECIAL PROVISION

SECTION 707, CONTINUED.

Other sections containing specific cross references:

Recurring Special Provisions affected:

Standard Sheets affected:

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised

___ 20__ Standard Specifications Book

___ Create RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

___ Revise RSP (No. _____)
Effective _____Letting
RSP Sunset Date: _____

Standard Drawing Effective _____

___ Create RPD (No. _____)
Effective _____Letting
___ Technical Advisory

GIFE Update Req'd.? Y___ N___
By - Addition or Revision

Frequency Manual Update Req'd? Y___ N___
By - Addition or Revision

Withdrawn ____

Received FHWA Approval? ____

DESIGN MANUAL

63-8.0 TRANSVERSE CONNECTION OF PRECAST BOX BEAMS

Adjacent, precast, prestressed box-beam bridge superstructures have been used extensively. The shear keys in this type of superstructure tend to crack and leak with a thin concrete deck placed composite with the beams. Research indicates that these cracks are due to thermal forces and not due to the live load of a vehicle moving across the bridge.

Research has shown that the following method is effective to minimize cracking in the shear keys between the beams.

1. Use epoxy grout due to its high bond strength.

2. Use a full-depth shear key to stop the joint from performing like a hinge to prevent the joint from opening. In past designs, the area below the key was open and free to rotate. With this area grouted, the movement of the joint will be reduced.

3. Apply compression across the joint by means of transverse tensioning rods. This will help prevent opening of the joint.

Figures 63-8A, 63-8B, and 63-8C illustrate methods to minimize cracking in this type of structure. and the use of transverse tensioning rods. Tensioning-rod details are shown on the INDOT Standard Drawings.

The joints between the beam shear keys, and the recesses for the transverse tensioning rods on the exterior face of the beam, should be grouted with an epoxy grout as shown in the details.

After the joints between the beams are grouted, a preliminary tightening of the transverse tensioning rods should be performed. Once this is completed, a final tensioning of the rods should be performed to yield 138 MPa as developed by a torque of 271 N-m.

63-9.0 SEGMENTAL CONSTRUCTION

Designers are continually being challenged to design structures with long spans and low initial cost. Long spans are used to reduce the number of piers required for a water crossing, and for the elimination of piers adjacent to roadway shoulders at an overpass bridge.

Prestressed-concrete-beam lengths in the range of 30 m to 40 m are common. For a continuous structure, the girders are fabricated in lengths to span from support to support. A closure pour is then made over the piers to provide continuity for live load and superimposed dead loads. This type of construction is cost effective because the girders can be erected in one piece without falsework. However, if girders are too long or too heavy to be shipped in lengths to accommodate the spans, spliced girders or segmental construction are options. Construction