

SPECIFICATION, SPECIAL PROVISIONS AND DRAWINGS  
REVISION TO STANDARD SPECIFICATIONS AND DRAWINGS

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PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: In the review of bridge standards several inconsistencies were found and many lacked clarity of the intent of the drawing.

PROPOSED SOLUTION: The bridge standard drawing sections 700 thru 706 have been revised to improve the intent of the drawing, eliminate errors and omissions and to promote a standard presentation.

APPLICABLE STANDARD SPECIFICATIONS: Sections 609, 704, and 706

APPLICABLE STANDARD DRAWINGS:

<u>Current Designation</u>	<u>Proposed Designation</u>
701-BPIL-02	701-BPIL-01
701-BPIL-04	701-BPIL-02
701-BPIL-05	701-BPIL-03 & 04
701-BPIL-06	701-BPIL-05
702-BCAW-01	Delete
702-CJTA-01	
703-BRST-01	
704-BDAF-01	704-BDCG-05
704-BDCG-01	704-BDCG-04
704-BDCG-02	704-BDCG-02
704-BDCG-03	704-BDCG-01
704-BDCG-04	704-BDCG-03
704-SBFD-01	
706-BRRW-01	706-MSRW-01
706-BRRW-02	706-MSRW-02
706-BRRW-03	706-MSRW-03
706-BRRW-04	706-MSRW-04
706-BRRW-05	706-MSRW-05
706-BRRW-06	706-MSRW-06
706-BRRW-07	706-MSRW-07
706-BRRW-08	706-MSRW-08
706-BRRW-09	706-MSRW-09

SPECIFICATION, SPECIAL PROVISIONS AND DRAWINGS  
REVISION TO STANDARD SPECIFICATIONS AND DRAWINGS

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(continued)

<u>Current Designation</u>	<u>Proposed Designation</u>
706-BRRW-10	706-MSRW-10
706-TASE-01	706-TBAE-01
706-TASE-02	706-TBAE-02
706-TASE-03	706-TBAE-03
706-TASE-04	Delete
706-TASE-05	706-TBAE-04

APPLICABLE DESIGN MANUAL SECTION: none

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: none

PAY ITEMS AFFECTED: none

Submitted By: Randy Strain

Title: Bridge Standard and Policy Engineer

Organization: INDOT

Phone Number: 317-232-3339

Date: Feb 14, 2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: none

REVISION TO STANDARD SPECIFICATIONS

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SECTION 609 - REINFORCED CONCRETE BRIDGE APPROACHES  
609.03 GENERAL REQUIREMENTS

The Standard Specifications are revised as follows:

SECTION 609, BEGIN LINE 22, INSERT AS FOLLOWS:

**609.03 General Requirements**

Subgrade shall be prepared in accordance with 207. Subbase shall be prepared in accordance with 302. *The RCBA extension shall be placed only where a concrete bridge-railing transition shall be located on the RCBA. If the transition shall be placed on the bridge, the RCBA shall be placed as shown on the plans.*

AGENDA ITEM 01

REVISION TO STANDARD SPECIFICATIONS

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SECTION 704 - CONCRETE FLOOR SLABS

704.02 MATERIALS

704.08 BASIS OF PAYMENT

SECTION 706 - BRIDGE RAILINGS

706.04 CONCRETE RAILING WITH REINFORCED CONCRETE MOMENT SLAB

The Standard Specifications are revised as follows:

SECTION 704, BEGIN LINE 09, INSERT AS FOLLOWS:

**704.02 Materials**

Materials shall be in accordance with the following:

Castings .....	910.05
Concrete, Class C .....	702
Joint Materials .....	910.05
<i>Profile Wall Polyvinyl Chloride Pipe</i> .....	<i>907.22</i>
Reinforcing Bars .....	910.01
<i>Smooth Wall Polyvinyl Chloride Pipe</i> .....	<i>907.23</i>

SECTION 704, BEGIN LINE 184, INSERT AS FOLLOWS:

The cost of forms, curing, finishing, preformed expansion joints within structure limits, *slab bridge floor drains*, and necessary incidentals shall be included in the cost of the pay items.

SECTION 706, BEGIN LINE 81, INSERT AS FOLLOWS:

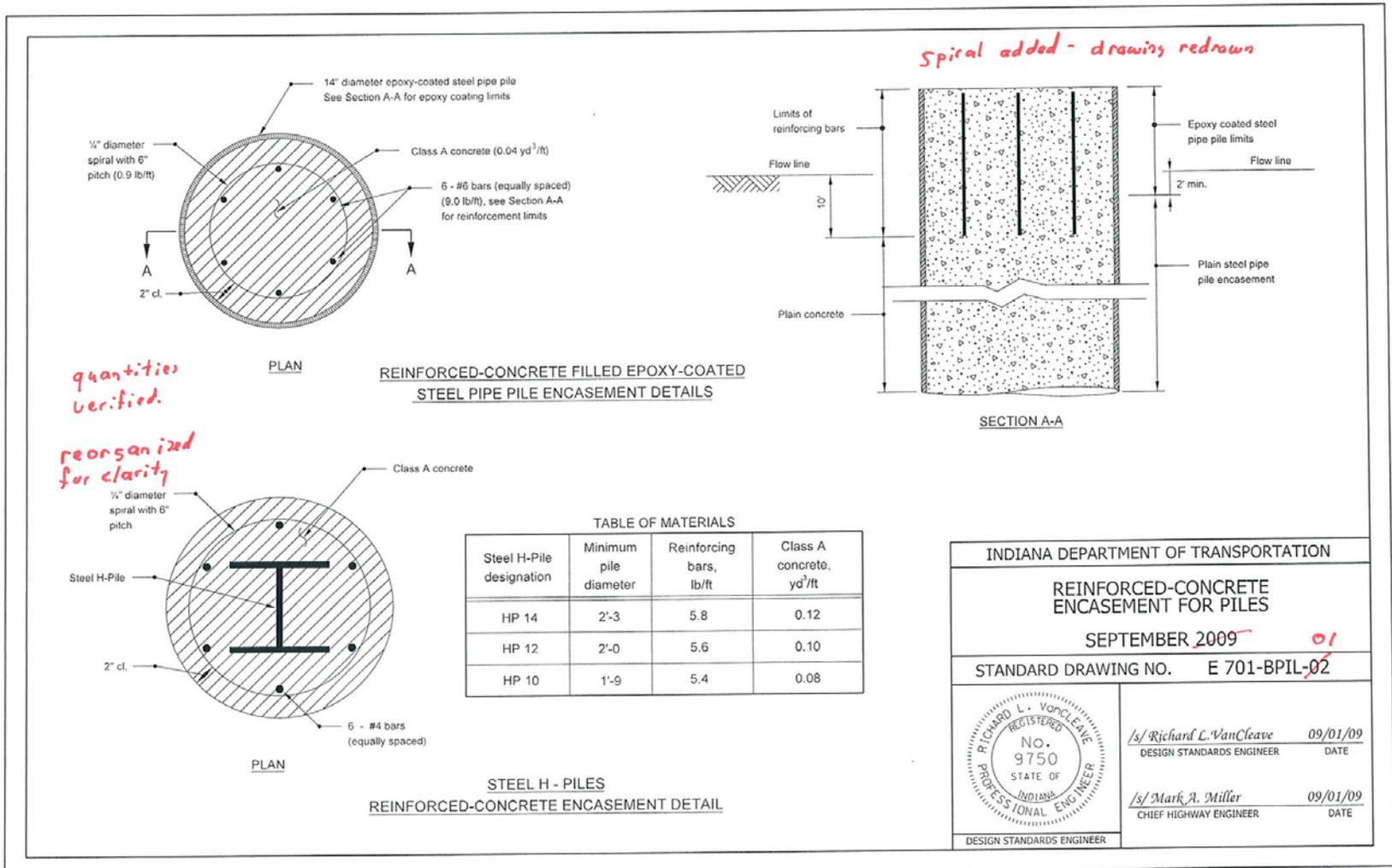
Moment slabs shall be formed with either steel or wood forms in accordance with 508.04(c)1 or 508.04(c)2. Vibration of the concrete shall be in accordance with 702.20(c). *The thickness of the moment slab shall match that of the adjoining PCCP, but it shall not be less than 12 in.*

The underdrains for MSE walls layer shall be compacted in accordance with 302.06(b). *The MSE-wall coping may be precast or cast in place.*

Type D-1 contraction joints and dowel bar assemblies shall be in accordance with 503. *The locations of the transverse joints in the moment slab and the railing shall be the same.*

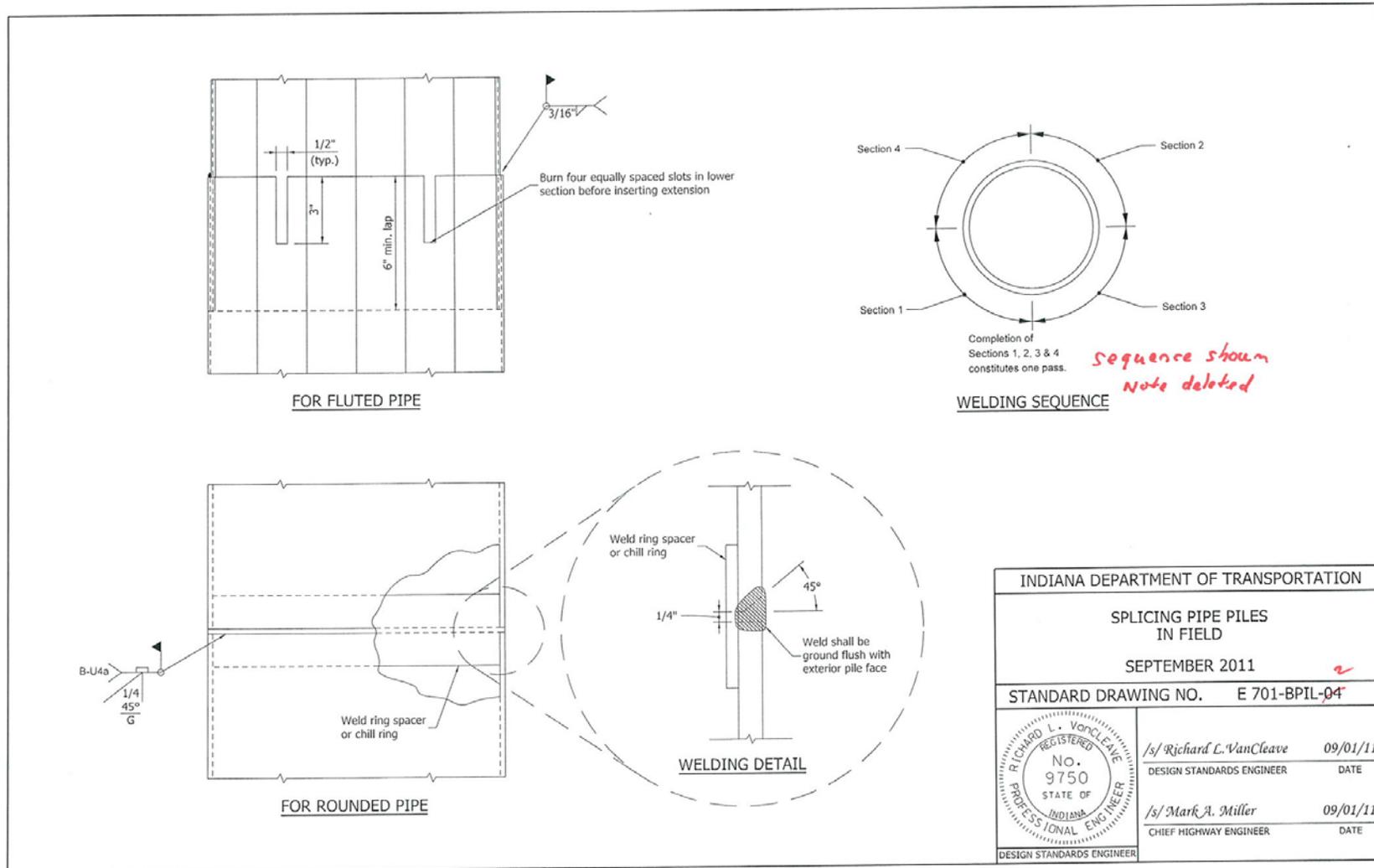
REVISION TO STANDARD DRAWINGS

EXISTING 701-BPIL-02 REINFORCED-CONCRETE ENCASEMENT FOR PILES (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

EXISTING 701-BPIL-04 SPLICING PIPE PILES IN FIELD (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

EXISTING 701-BPIL-05 STEEL H-PILE SPLICE PROCEDURE (WITH MARKUPS)

**PROCEDURE FOR SPLICING PARTIALLY DRIVEN PILING**

**WEB VIEWS (this column)**

**FLANGE VIEWS (this column)**

1. **Upper Section**  
Prepare outside of both flanges and one side of web by beveling to a 45 deg angle. Grind all surfaces to be welded.
2. **Lower Section**  
Prepare top of pile to be extended by squaring all surfaces. Grind all surfaces to be welded, extending 1/2" beyond weld area(s).
3. **Upper Section**  
Fillet weld web splice plate to upper section at 2 locations.  
*See Detail A* **190° view added**
4. **Lower Section**  
Tack weld two backer plates to inside of flange.
5. **Combine Sections**  
Lift and hold upper section into place, maintaining 1/4" gap between upper and lower pile sections by using the remaining two backer plates as a guide. Plumb the pile. Tack weld the untacked side of the two backer plates to the inside upper flange. Remove the backer plate spacers and tack weld them to the inside flange portion of the upper and lower sections of the pile. Fillet weld the remaining two sides of the web splice plate to the lower section.
6. **Combined Section**  
Complete Joint Penetration (CJP) weld the web.
7. **Combined Section**  
Complete Joint Penetration (CJP) weld both flanges. Grind weld smooth with the pile.
8. **Combined Section**  
Fillet weld the flange splice plates to the flanges.

**END VIEW**

**DETAIL A**

**COMPLETED SPLICE ISOMETRIC (backer plates not shown)**

**COMPLETED SPLICE END VIEW**

**DETAIL B**

**NOTES:** *notes added.*

1. Steel H piling may be spliced in a horizontal position prior to driving using splice plates and web and flange penetration welds as shown below.
2. Use 3/8 in. thick square splice plates and 1/4 in. fillet welds. All fillet welds shall be single pass. *Added to table*
3. Use 1/4 in. thick backer plates. *Added to table*

**SPLICE PLATE AND BACKER PLATE DIMENSIONS AND PLACEMENT**

**SPLICE PLATE AND BACKER PLATE DIMENSIONS**

H-PILE SIZE	HP 10	HP 12	HP 14
FLANGE, F	7"	8 1/4"	10 1/4"
WEB, W	5 3/8"	6 3/4"	8"
LENGTH, L	4 1/8"	5"	6 1/4"

INDIANA DEPARTMENT OF TRANSPORTATION

STEEL H-PILE SPLICE PROCEDURE

SEPTEMBER 2011 *03*

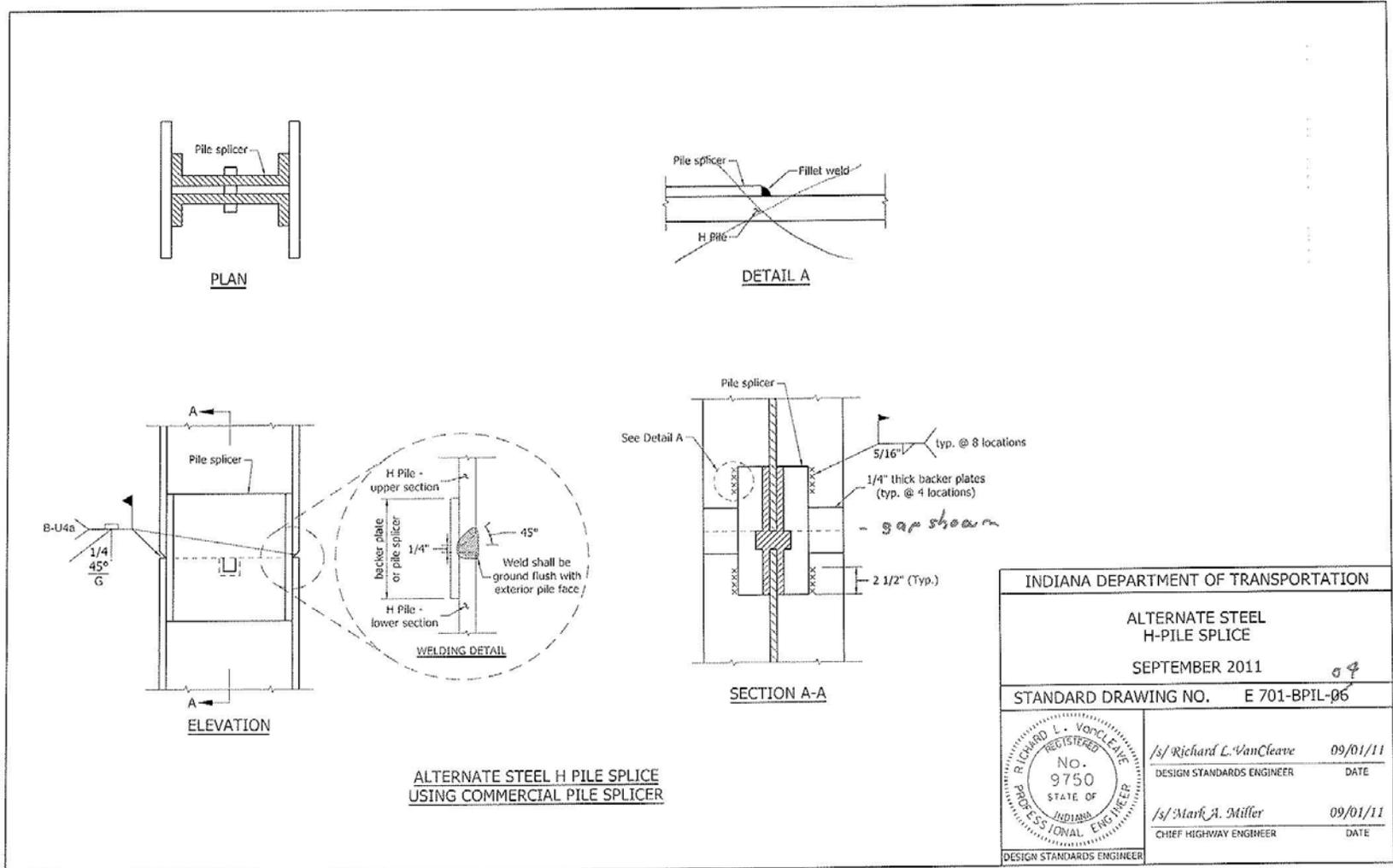
STANDARD DRAWING NO. E 701-BPIL-05

	/s/ Richard L. VanCleave	09/01/11
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	09/01/11
DESIGN STANDARDS ENGINEER	CHIEF HIGHWAY ENGINEER	DATE

*details for procedure shown in 03 & 04*

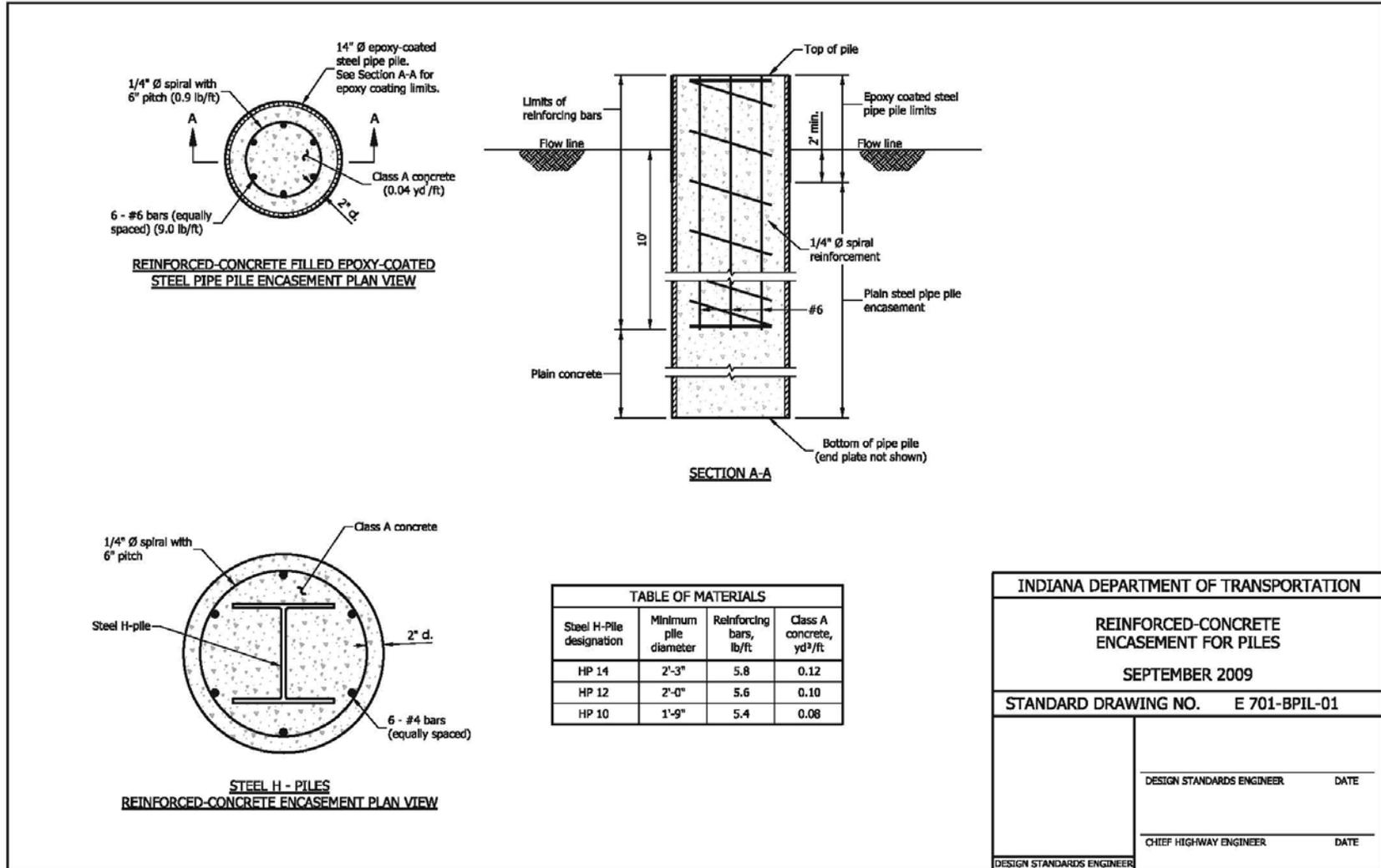
REVISION TO STANDARD DRAWINGS

EXISTING 701-BPIL-06 ALTERNATE STEEL H-PILE SPLICE (WITH MARKUPS)



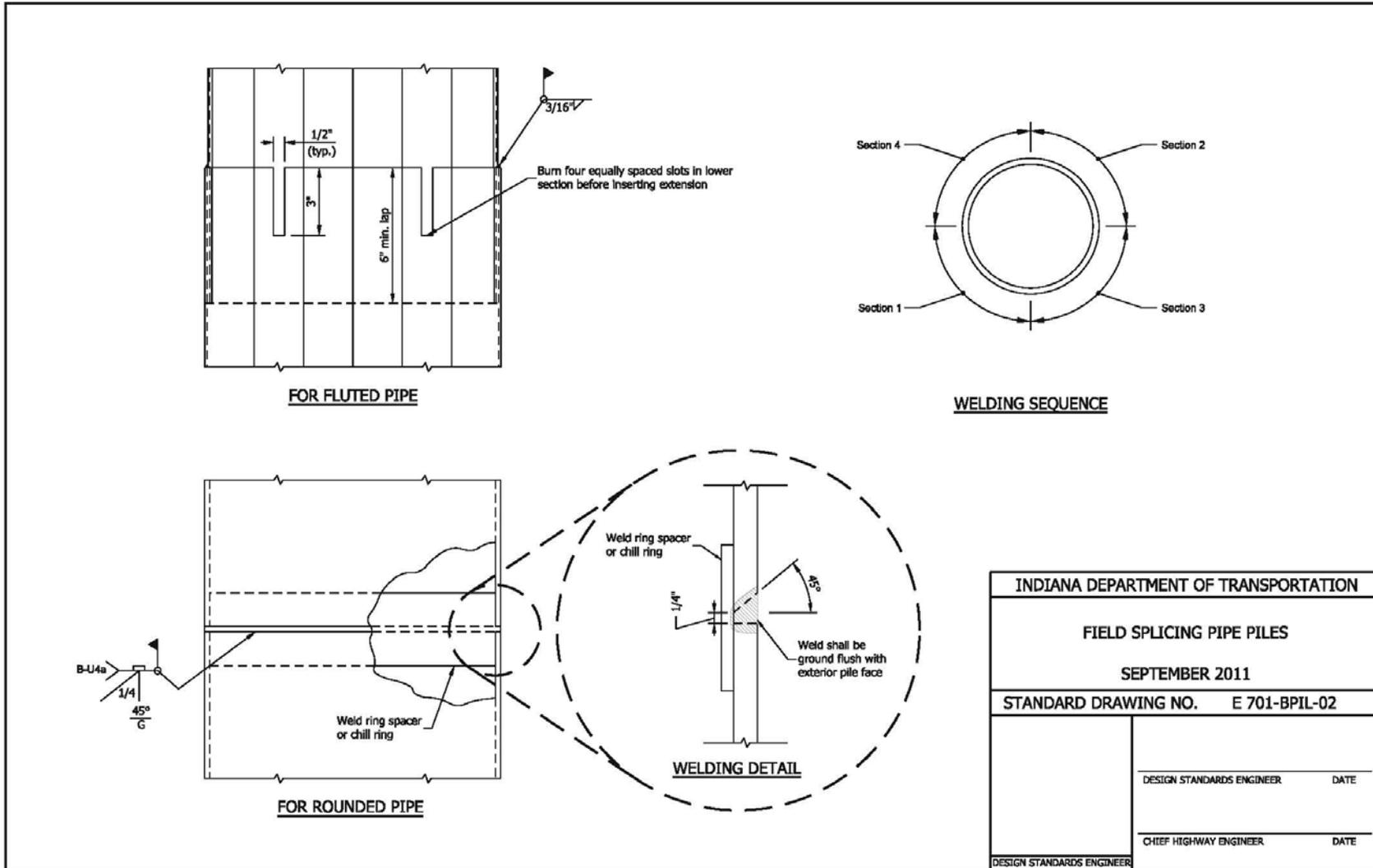
REVISION TO STANDARD DRAWINGS

701-BPIL-01 REINFORCED-CONCRETE ENCASEMENT FOR PILES (DRAFT)



REVISION TO STANDARD DRAWINGS

701-BPIL-02 FIELD SPLICING PIPE PILES (DRAFT)



INDIANA DEPARTMENT OF TRANSPORTATION	
FIELD SPLICING PIPE PILES	
SEPTEMBER 2011	
STANDARD DRAWING NO. E 701-BPIL-02	
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

701-BPIL-03 STEEL H-PILE SPLICE (DRAFT)

**PROCEDURE FOR SPLICING PARTIALLY DRIVEN PILING**

**1. Upper Pile Section**  
 Prepare outside of both flanges and one side of web by beveling to a 45° angle. Prepare all surfaces to be welded by grinding.

**WEB ELEVATION**

**FLANGE ELEVATION**

**END VIEW**

**2. Lower Pile Section**  
 Prepare top of pile by restoring it to its original cross section. Grind all surfaces to be welded, extending 1/2" beyond weld area(s).

**3. Upper Pile Section**  
 Fillet weld web splice plate to upper pile section at two locations.

**4. Lower Pile Section**  
 Tack weld two backer plates to inside of flange.

Procedure continued on Standard Drawing E 701-BPIL-04.

**NOTES**

- Steel H piling may be spliced in a horizontal position prior to driving, using splice plates and web and flange welds as shown.
- Two flange splice plates, one web splice plate, and four backer plates will be required per splice.
- All fillet welds shall be single pass.
- See table for splice plate dimensions W and F.

**SPLICE PLATE AND BACKER PLATE DIMENSIONS**

H-PILE SIZE	HP 10	HP 12	HP 14
Flange Splice Plate, F	7"	8 1/4"	10 1/4"
Web Splice Plate, W	5 3/8"	6 3/4"	8"
Backer Plate Length, L	4 1/8"	5"	6 1/4"

NOTE: Splice plate thickness = 3/8"  
 Backer plate thickness = 1/4"

**INDIANA DEPARTMENT OF TRANSPORTATION**

**STEEL H-PILE SPLICE**

**SEPTEMBER 2011**

**STANDARD DRAWING NO. E 701-BPIL-03**

DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE

DESIGN STANDARDS ENGINEER

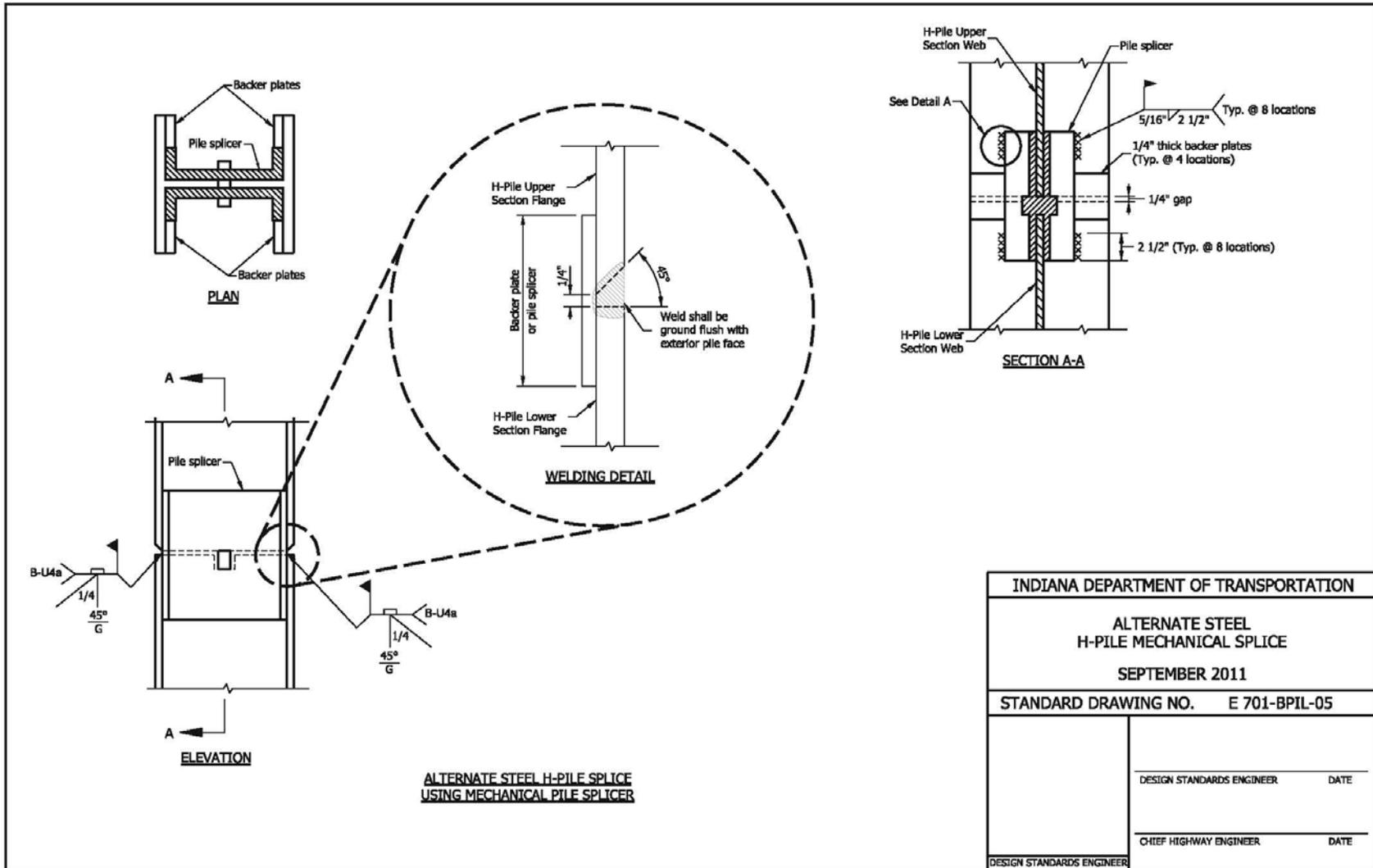
REVISION TO STANDARD DRAWINGS

701-BPIL-04 STEEL H-PILE SPLICE (CONTINUED) (DRAFT)

PROCEDURE FOR SPLICING PARTIALLY DRIVEN PILING (cont.)	WEB ELEVATION	FLANGE ELEVATION	END VIEW	NOTES												
<p><b>5. Combine Pile Sections</b>                      Lift and hold upper pile section into place, maintaining 1/4" gap between upper and lower pile sections by using the remaining two backer plates as a spacing guide. Plumb the pile. Tack weld the untacked side of the two backer plates to the inside upper flange. Remove the backer plate spacers and tack weld them to the inside flange portion of the upper and lower sections of the pile. Fillet weld the remaining two sides of the web splice plate to the lower section.</p>				<p>1. Steel H piling may be spliced in a horizontal position prior to driving, using splice plates and web and flange welds as shown.</p> <p>2. Two flange splice plates, one web splice plate, and four backer plates will be required per splice.</p> <p>3. All fillet welds shall be single pass.</p> <p>④ See Standard Drawing E 701-BPIL-03 table for splice plate dimensions W and F.</p>												
<p><b>6. Combined Pile Section</b>                      Complete Joint Penetration (CJP) weld the web. See Detail A.</p>																
<p><b>7. Combined Pile Section</b>                      Complete Joint Penetration (CJP) weld both flanges. Grind weld smooth with the pile exterior face. See Detail B.</p>			<p>DETAIL A</p>	<p>DETAIL B</p>												
<p><b>8. Combined Pile Section</b>                      Fillet weld the flange splice plates to the flanges.</p>				<table border="1"> <tr> <td colspan="2" data-bbox="1409 1065 1856 1089">INDIANA DEPARTMENT OF TRANSPORTATION</td> </tr> <tr> <td colspan="2" data-bbox="1409 1089 1856 1203">STEEL H-PILE SPLICE (CONTINUED) SEPTEMBER 2011</td> </tr> <tr> <td colspan="2" data-bbox="1409 1203 1856 1235">STANDARD DRAWING NO. E 701-BPIL-04</td> </tr> <tr> <td data-bbox="1409 1235 1570 1300">DESIGN STANDARDS ENGINEER</td> <td data-bbox="1570 1235 1856 1300">DATE</td> </tr> <tr> <td data-bbox="1409 1300 1570 1365">CHIEF HIGHWAY ENGINEER</td> <td data-bbox="1570 1300 1856 1365">DATE</td> </tr> <tr> <td colspan="2" data-bbox="1409 1365 1856 1421">DESIGN STANDARDS ENGINEER</td> </tr> </table>	INDIANA DEPARTMENT OF TRANSPORTATION		STEEL H-PILE SPLICE (CONTINUED) SEPTEMBER 2011		STANDARD DRAWING NO. E 701-BPIL-04		DESIGN STANDARDS ENGINEER	DATE	CHIEF HIGHWAY ENGINEER	DATE	DESIGN STANDARDS ENGINEER	
INDIANA DEPARTMENT OF TRANSPORTATION																
STEEL H-PILE SPLICE (CONTINUED) SEPTEMBER 2011																
STANDARD DRAWING NO. E 701-BPIL-04																
DESIGN STANDARDS ENGINEER	DATE															
CHIEF HIGHWAY ENGINEER	DATE															
DESIGN STANDARDS ENGINEER																

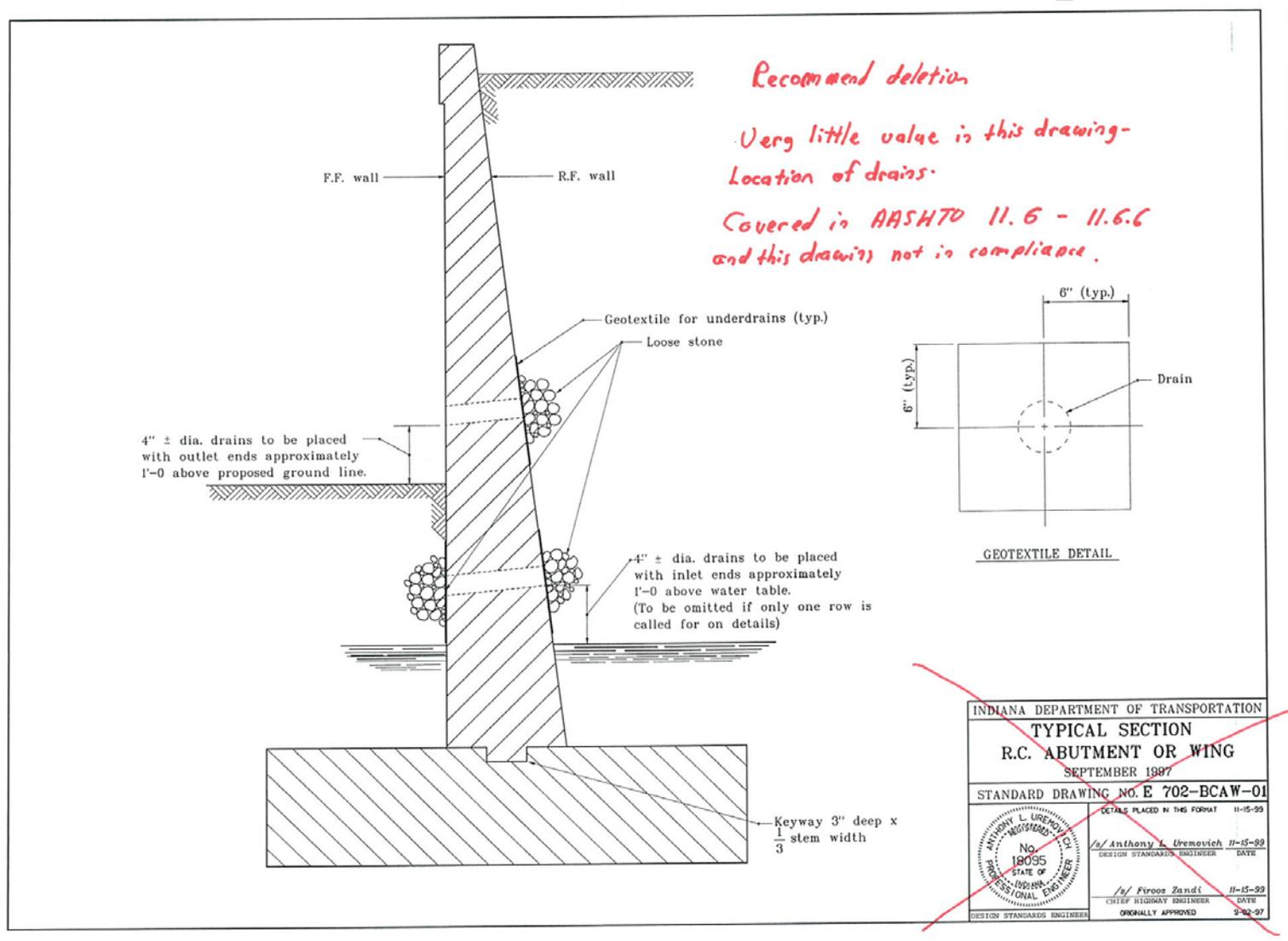
REVISION TO STANDARD DRAWINGS

701-BPIL-05 ALTERNATE STEEL H-PILE MECHANICAL SPLICE (DRAFT)



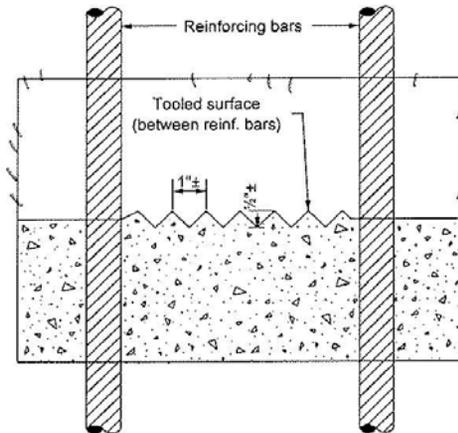
REVISION TO STANDARD DRAWINGS

EXISTING 702-BCAW-01 TYPICAL SECTION R.C. ABUTMENT OR WING (PROPOSED TO DELETE)



REVISION TO STANDARD DRAWINGS

EXISTING 702-CJTA-01 TYPE A CONSTRUCTION JOINT (WITH MARKUPS)



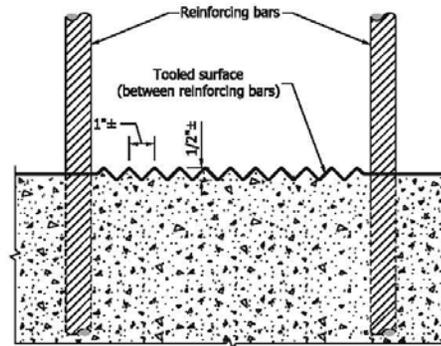
*resize/rescale*

INDIANA DEPARTMENT OF TRANSPORTATION	
TYPE A CONSTRUCTION JOINT MARCH 2003	
STANDARD DRAWING NO. E 702-CJTA-01	
	<i>/s/ Richard L. Vancleave</i> 3-03-03 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Richard K. Smutter</i> 3-03-03 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

Item No.01 03/15/12 (2012 SS)(contd.)  
Mr. Strain  
Date: 03/15/12

REVISION TO STANDARD DRAWINGS

702-CJTA-01 TYPE A CONSTRUCTION JOINT (DRAFT)



INDIANA DEPARTMENT OF TRANSPORTATION	
TYPE A CONSTRUCTION JOINT MARCH 2003	
STANDARD DRAWING NO. E 702-CJTA-01	
DESIGN STANDARDS ENGINEER	DESIGN STANDARDS ENGINEER DATE
	CHIEF HIGHWAY ENGINEER DATE
	DESIGN STANDARDS ENGINEER

REVISION TO STANDARD DRAWINGS

EXISTING 703-BRST-01 BAR BENDING DETAILS (WITH MARKUPS)

**REINFORCING BAR NOTES**

- All dimensions on bending diagrams are measured out to out of bars.
- All dimensions on details are measured on centerlines of bars, except where COVER is indicated.
- Bent bars are given an alphanumeric bar mark (e.g. 588). The last two digits (e.g. 88) indicate the mark. The characters preceding the last two digits (e.g. 5) indicate the size of the bar.
- Straight bars are designated by size and length.
- Standard size hooks shown on this sheet to be used on all hooked bars unless noted.
- See bridge plans or structure plans for lap and embedment lengths.

**SPLICE BAR NOTES**

- ~~All samples of reinforcing steel shall consist of bars 5'-0 in length.~~
- ~~For straight bars make cut 5'-0 from end.~~
- ~~For bent bars use bars that have straight portion longer than 120 diameters plus 6'-0 and make cuts 60 diameters plus 6" and 60 diameters plus 5'-6 from the same bend point or hooked end.~~
- ~~Splice bars to lap with bars from which test samples are cut, making laps of 60 diameters at each cut end.~~

Note added for Standard drawing bent bars

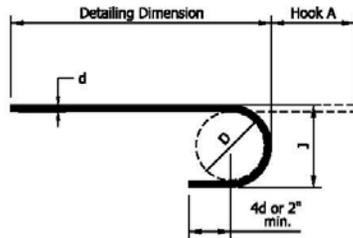
**STANDARD HOOKS**

BAR SIZE	D, in.	180° HOOK			90° HOOK
		HOOK A	J	H	HOOK A
#3	2¼	5"	3"	4"	6"
#4	3¼	6"	4"	4"	8"
#5	3¾	7"	5"	5"	10"
#6	4½	8"	6"	6"	1'-0
#7	5½	10"	7"	7"	1'-2
#8	6	11"	8"	8"	1'-4
#9	9½	1'-3	11¾"	10½"	1'-7
#10	11	1'-5	1'-1¼	11¾"	1'-10
#11	12	1'-7	1'-2¾	1'-1	2'-0
#14	18½	2'-3	1'-9½	1'-5¾	2'-6½
#18	24	3'-0	2'-4½	1'-11¼	3'-5½

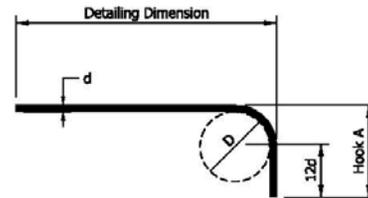
INDIANA DEPARTMENT OF TRANSPORTATION	
BAR BENDING DETAILS	
MARCH 2003	
STANDARD DRAWING NO. E 703-BRST-01	
	/s/ Richard L. VanCleave    3-03-03 DESIGN STANDARDS ENGINEER    DATE
	/s/ Richard K. Smutzer    3-03-03 CHIEF HIGHWAY ENGINEER    DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

703-BRST-01 BAR BENDING DETAILS (DRAFT)



180° HOOK



90° HOOK

REINFORCING BAR NOTES

1. All dimensions on bending diagrams shall be measured out-to-out of bars.
2. All dimensions on details shall be measured on centerlines of bars, except where cover or c. l. is indicated.
3. Bent bars will be given a numeric bar mark, e.g., 588. The last two digits, e.g., 88, indicate the mark. The characters preceding the last two digits, e.g., 5, indicate the size of the bar.
4. Bent reinforcing bars' marks on standard drawings will consist of the first digit as the bar size; the second digit, 7, indicating that it shall be placed in a bridge railing, or 8, indicating that it shall be placed in a bridge-railing transition, or 9, indicating that it shall be placed elsewhere; and the third and fourth digits as the serial number for that bar size.
5. Straight bars will be designated by size and length.
6. Standard size hooks shown shall be used on all hooked bars unless noted.
7. See the plans for lap and embedment lengths.

STANDARD END HOOKS				
		180° HOOK		90° HOOK
BAR SIZE	D	HOOK A	J	HOOK A
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	1'-0"
#7	5 1/4"	10"	7"	1'-2"
#8	6"	11"	8"	1'-4"
#9	9 1/2"	1'-3"	11 3/4"	1'-7"
#10	10 3/4"	1'-5"	1'-1 1/4"	1'-10"
#11	12"	1'-7"	1'-2 3/4"	2'-0"
#14	18 1/4"	2'-3"	1'-9 3/4"	2'-7"
#18	24"	3'-0"	2'-4 1/2"	3'-5"

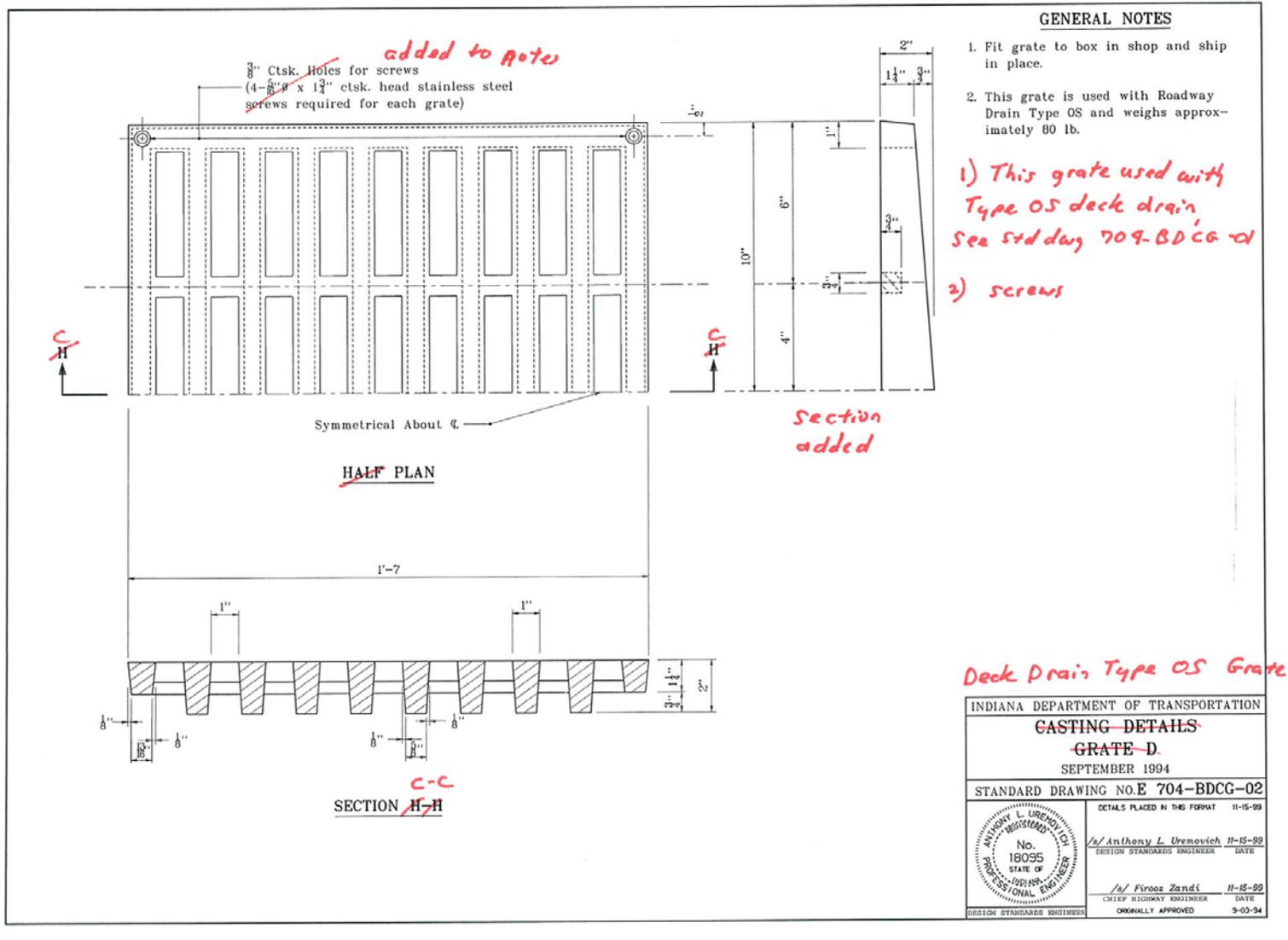
INDIANA DEPARTMENT OF TRANSPORTATION	
BAR BENDING DETAILS	
MARCH 2003	
STANDARD DRAWING NO. E 703-BRST-01	
	DESIGN STANDARDS ENGINEER _____ DATE _____
	CHIEF HIGHWAY ENGINEER _____ DATE _____
DESIGN STANDARDS ENGINEER _____	





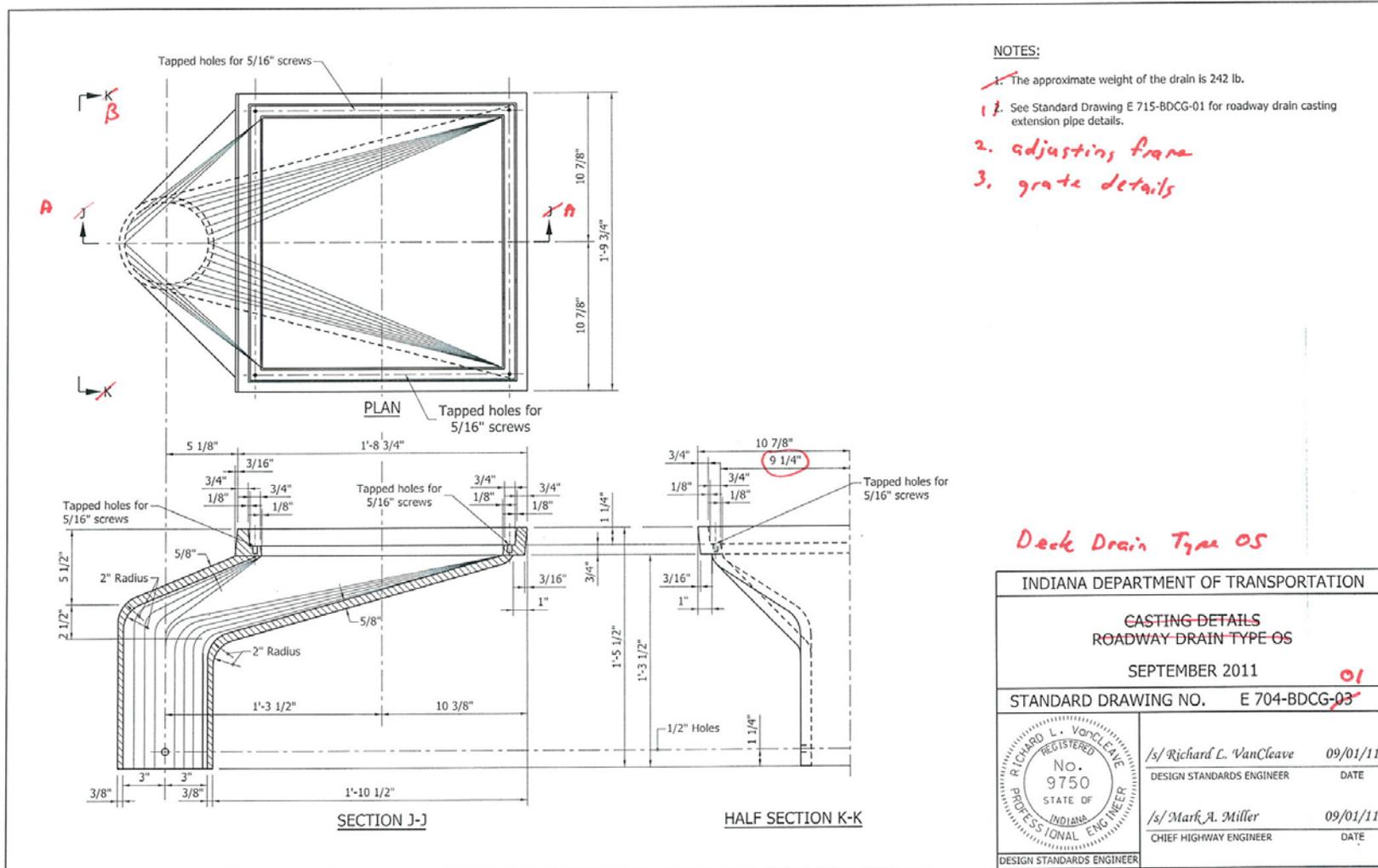
REVISION TO STANDARD DRAWINGS

EXISTING 704-BDCG-02 CASTING DETAILS GRATE D (WITH MARKUPS)



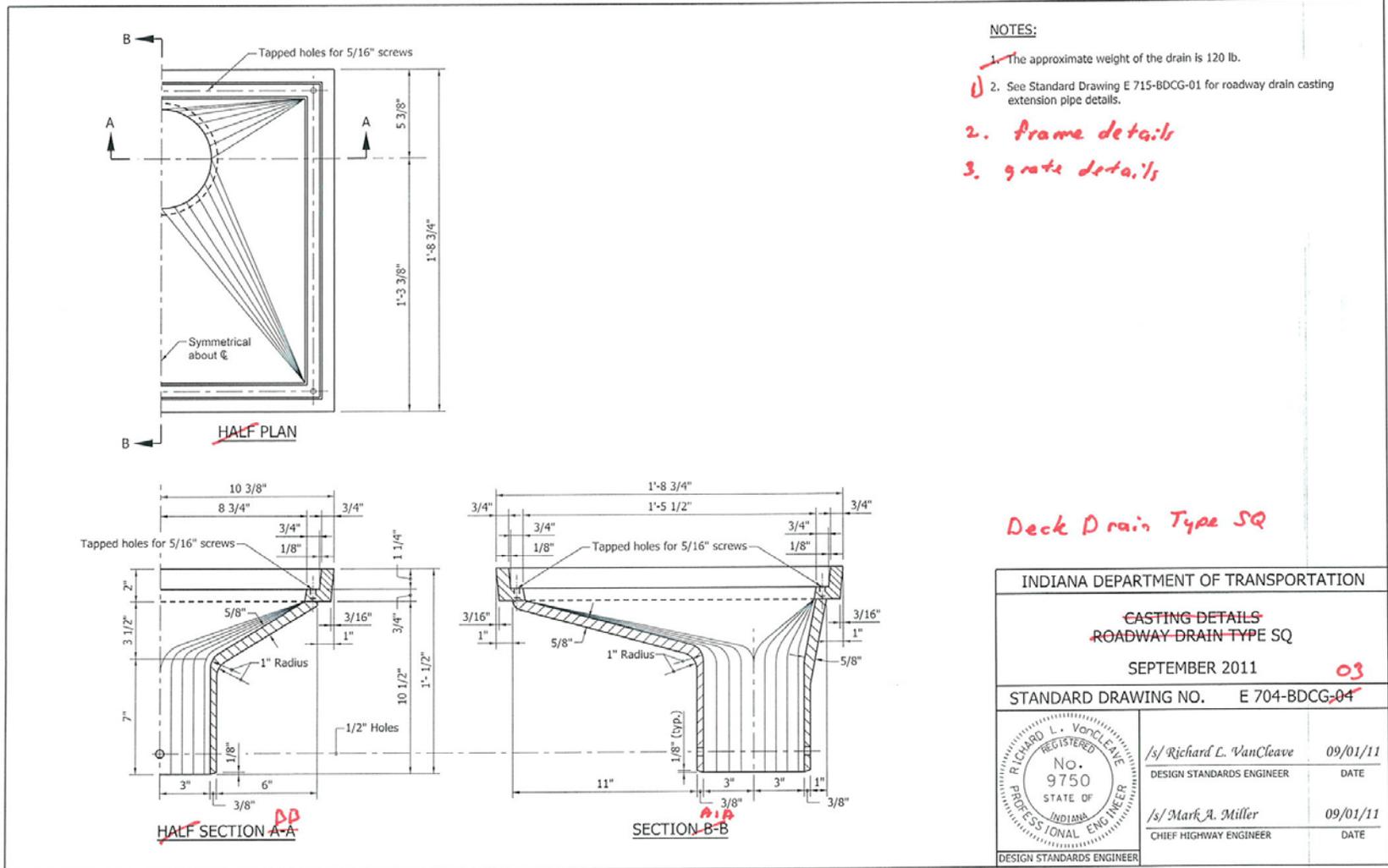
REVISION TO STANDARD DRAWINGS

EXISTING 704-BDCG-03 CASTING DETAILS ROADWAY DRAIN TYPE OS (WITH MARKUPS)



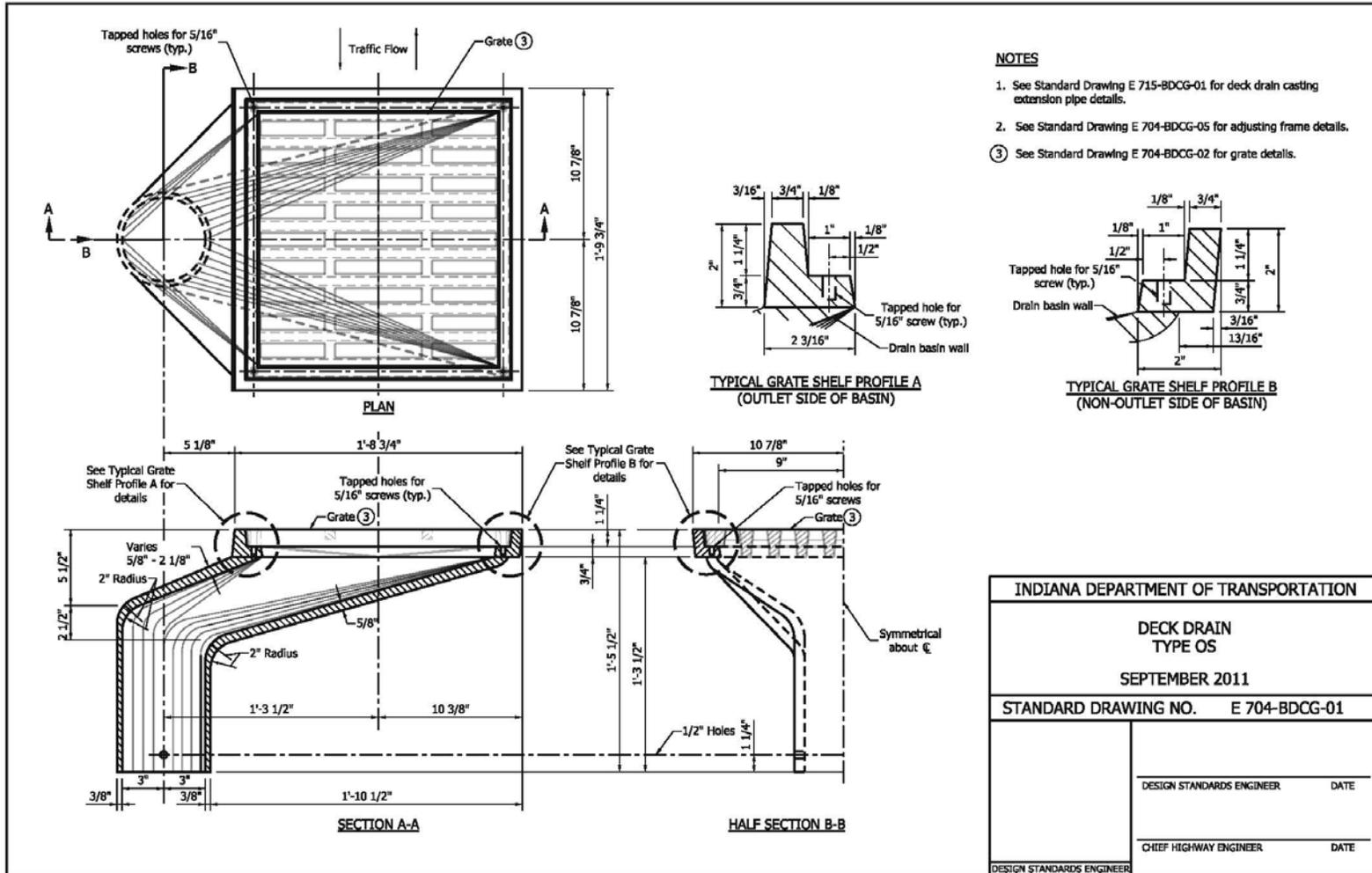
REVISION TO STANDARD DRAWINGS

EXISTING 704-BDCG-04 CASTING DETAILS ROADWAY DRAIN TYPE SQ (WITH MARKUPS)



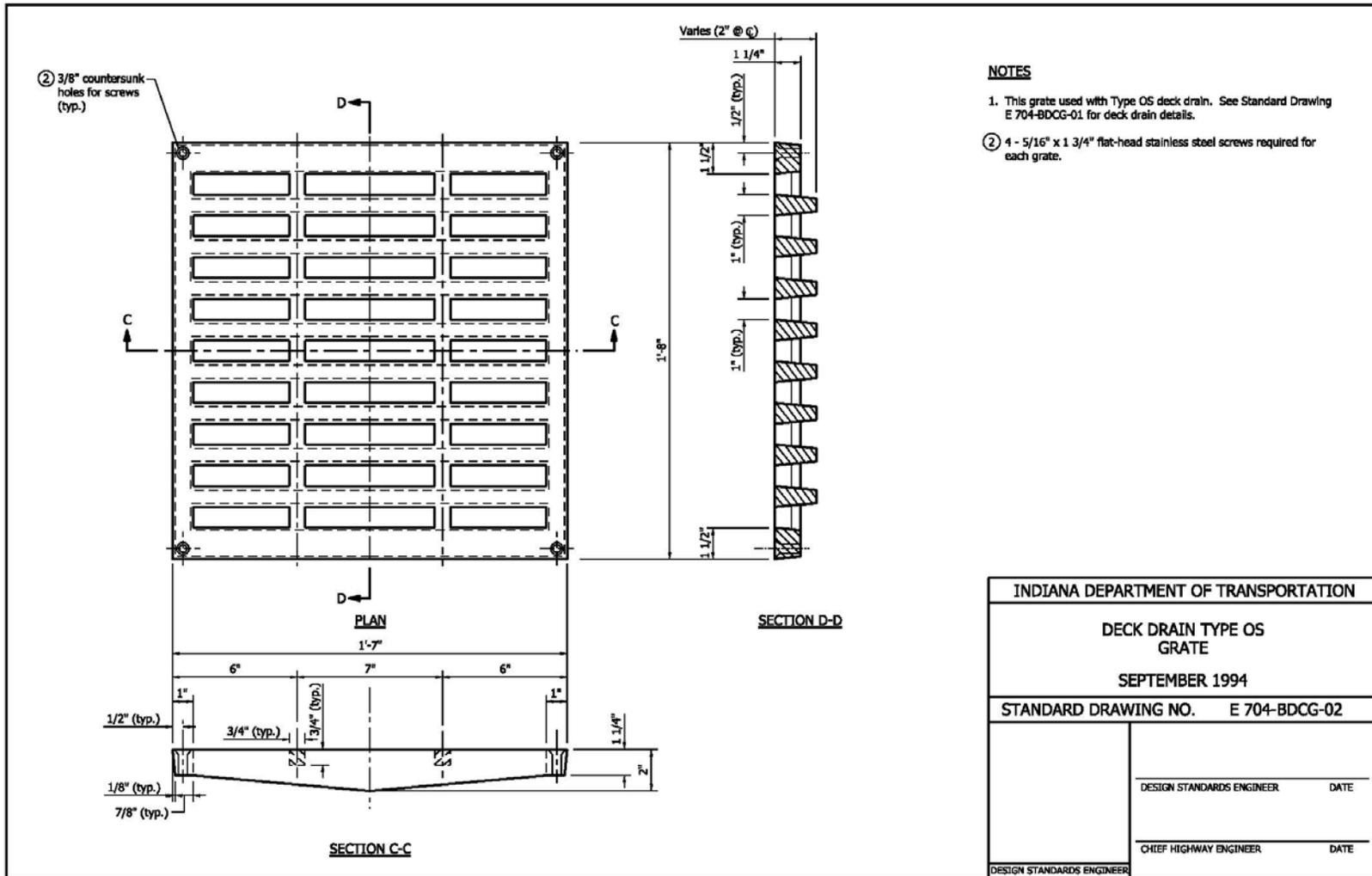
REVISION TO STANDARD DRAWINGS

704-BDCG-01 DECK DRAIN TYPE OS (DRAFT)



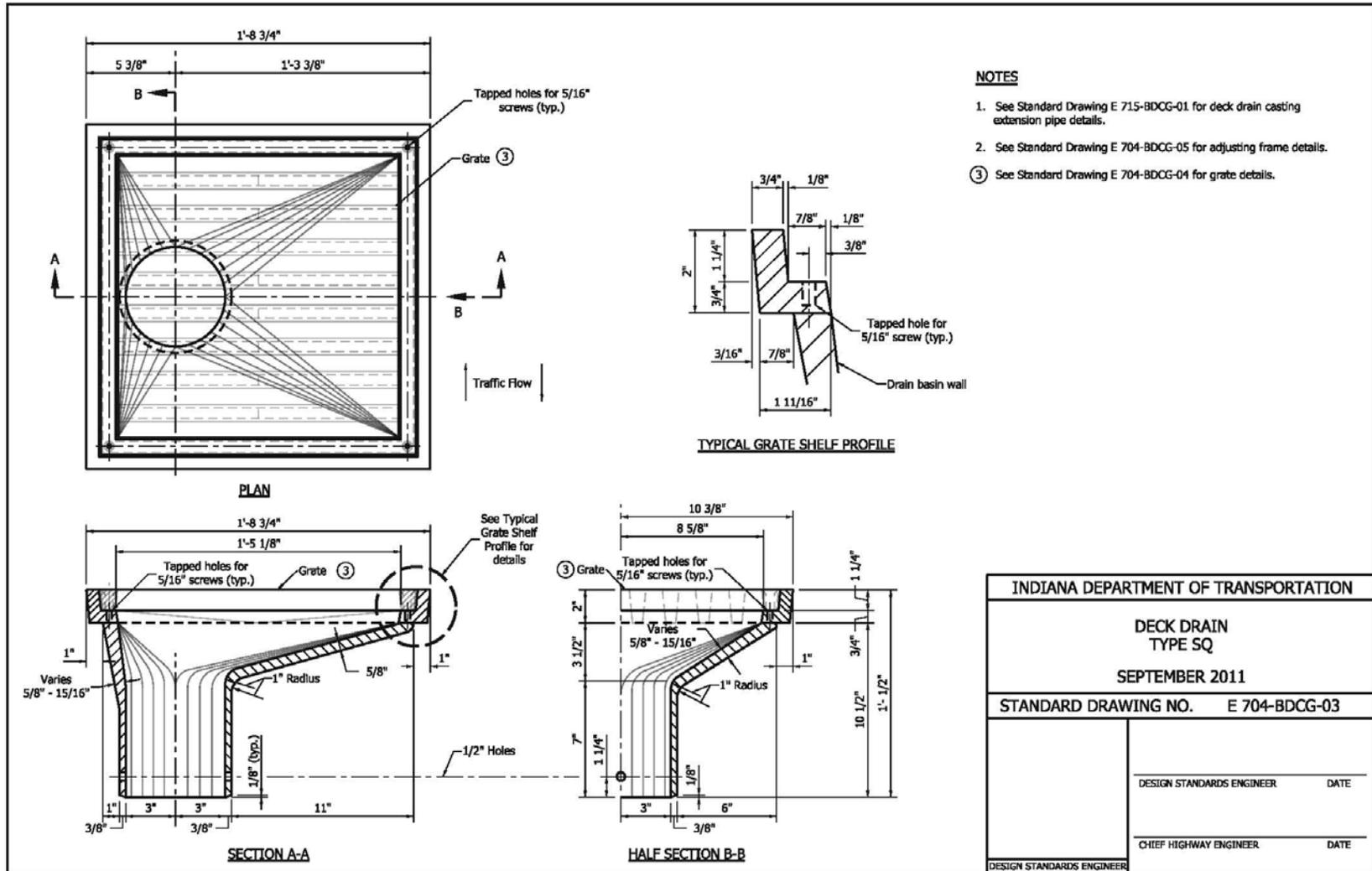
REVISION TO STANDARD DRAWINGS

704-BDCG-02 DECK DRAIN TYPE OS GRATE (DRAFT)



REVISION TO STANDARD DRAWINGS

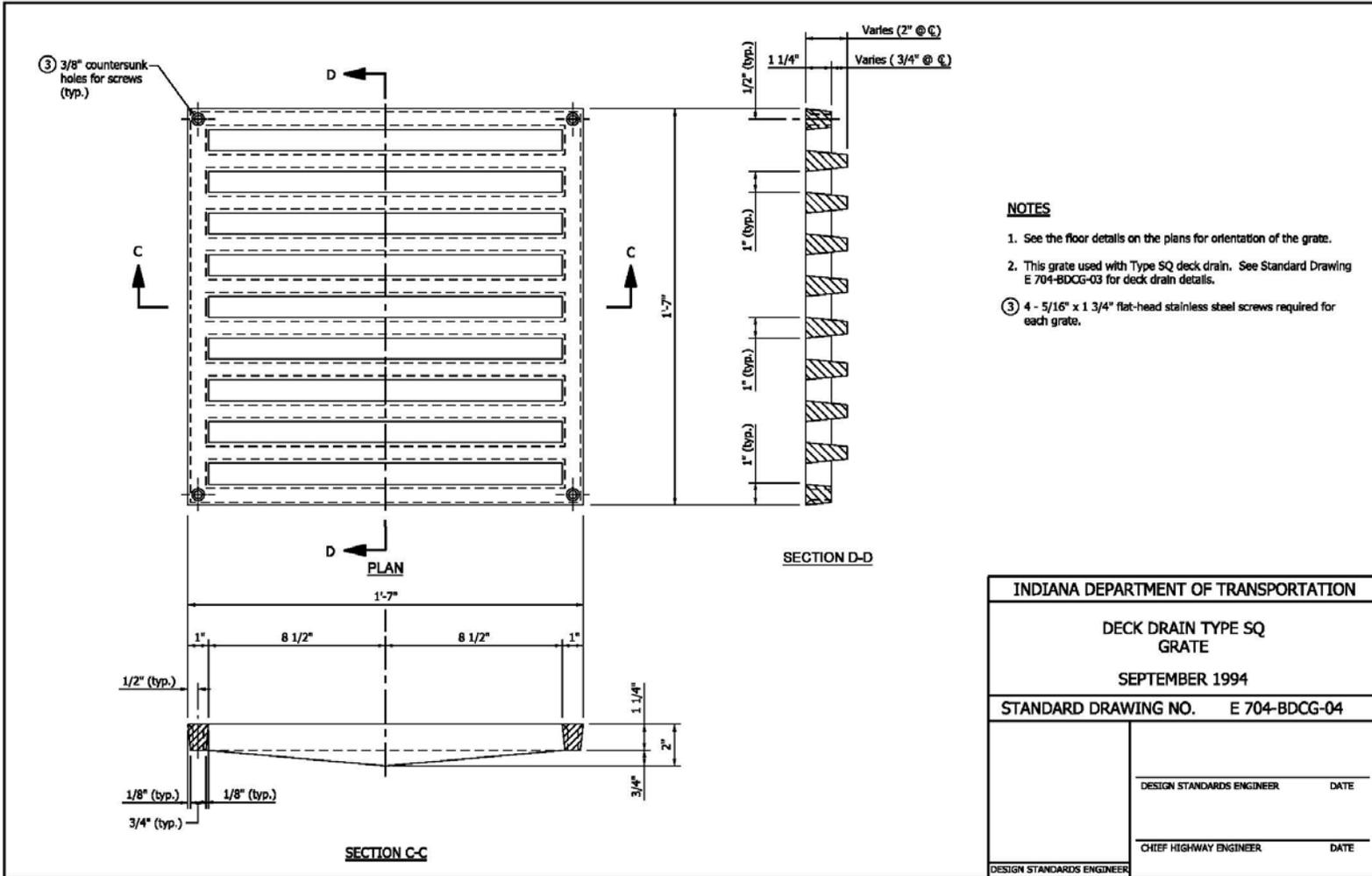
704-BDCG-03 DECK DRAIN TYPE SQ (DRAFT)



INDIANA DEPARTMENT OF TRANSPORTATION	
DECK DRAIN TYPE SQ	
SEPTEMBER 2011	
STANDARD DRAWING NO. E 704-BDCG-03	
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

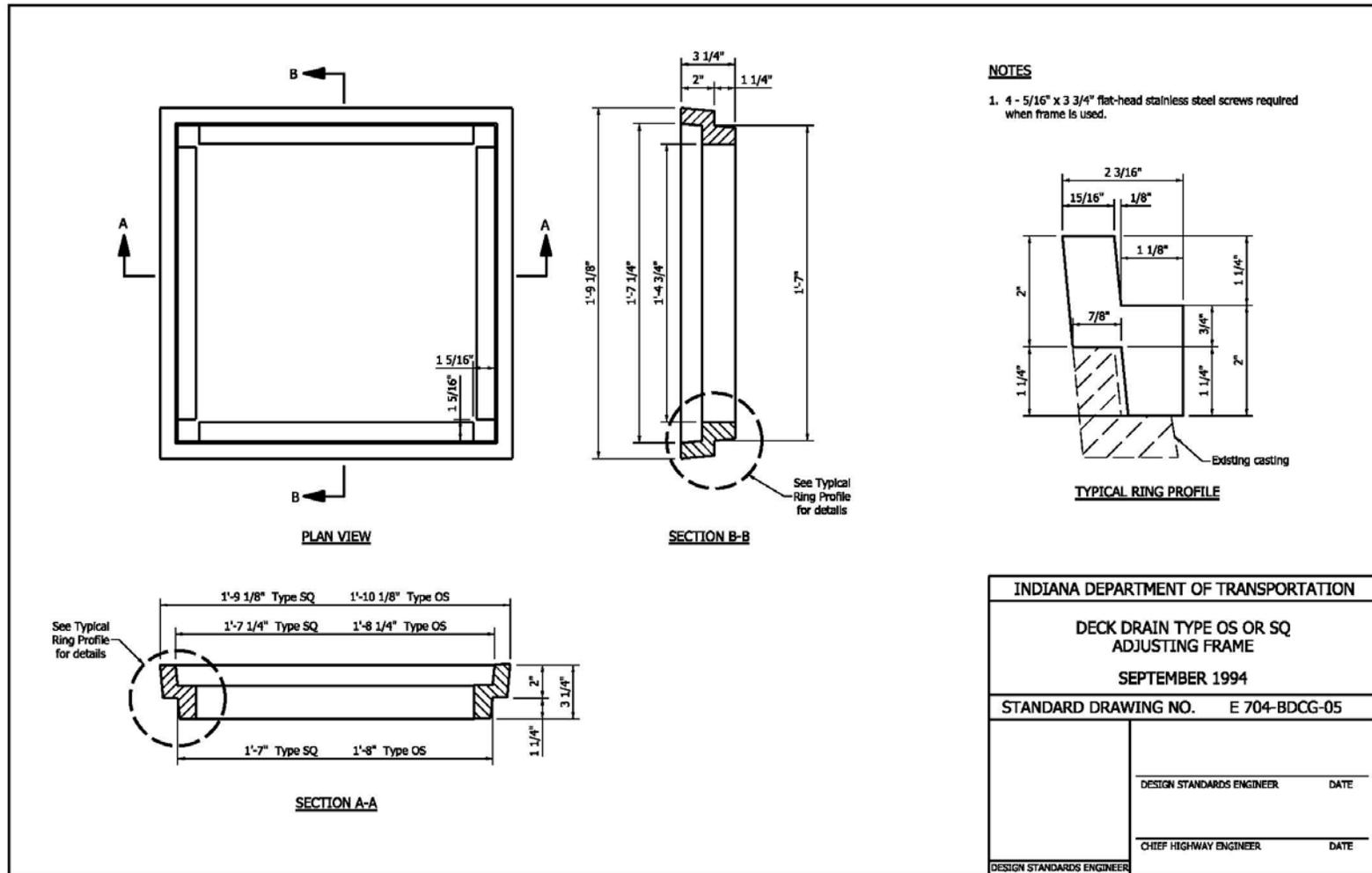
REVISION TO STANDARD DRAWINGS

704-BDCG-04 DECK DRAIN TYPE SQ GRATE (DRAFT)



REVISION TO STANDARD DRAWINGS

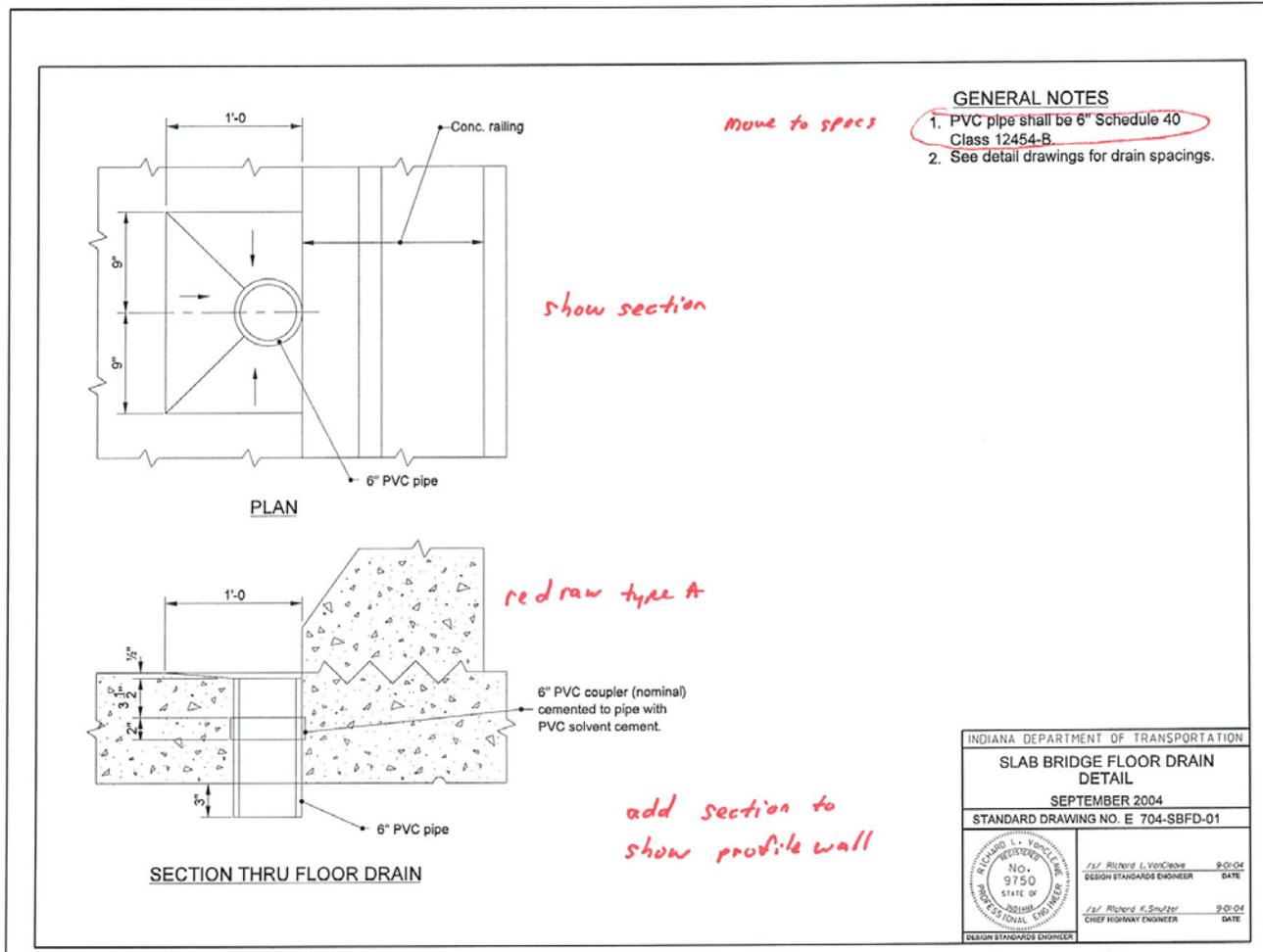
704-BDCG-05 DECK DRAIN TYPE OS OR SQ ADJUSTING FRAME (DRAFT)



REVISION TO STANDARD DRAWINGS

EXISTING 704-SBFD-01 SLAB BRIDGE FLOOR DRAIN DETAIL (WITH MARKUPS)

- 704.02 Materials add  
 907.22 Profile Wall Polyvinyl Chloride Pipe  
 907.23 Smooth Wall Polyvinyl Chloride Pipe

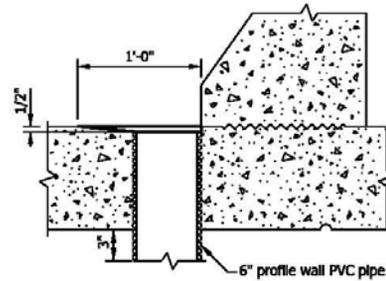
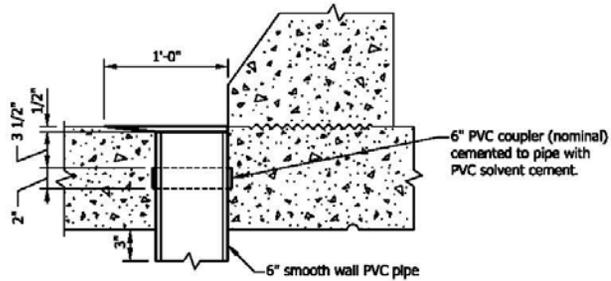
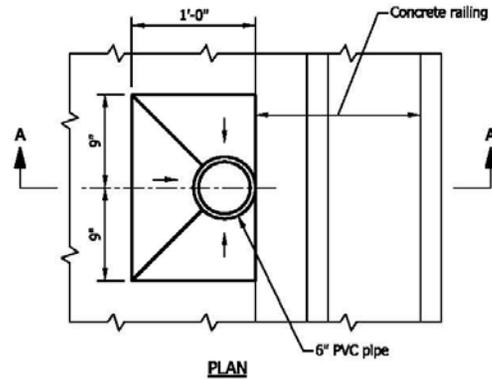


REVISION TO STANDARD DRAWINGS

704-SBFD-01 SLAB BRIDGE FLOOR DRAIN DETAIL (DRAFT)

**NOTE**

1. See plans for drain spacing.

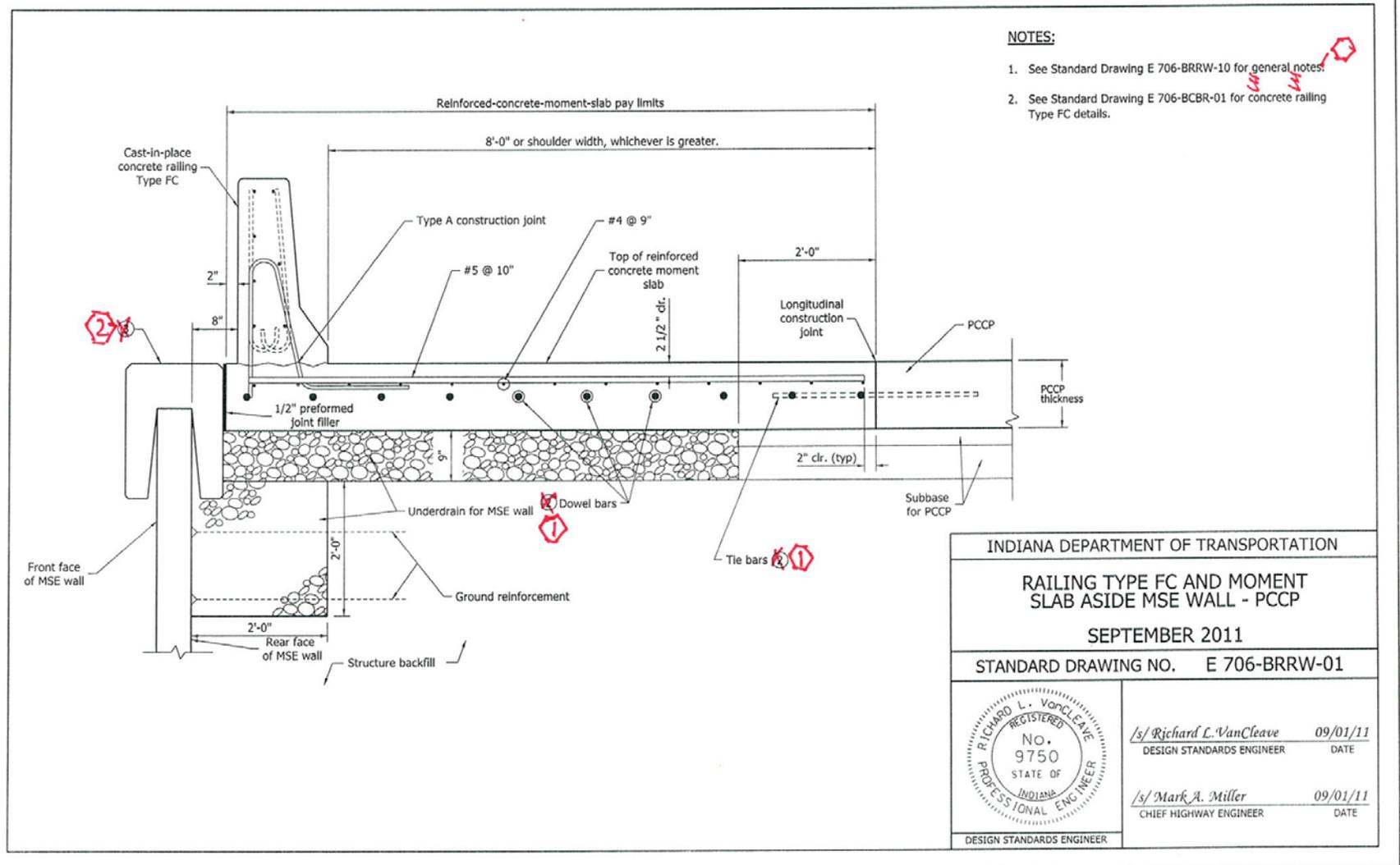


**SECTION A-A**

INDIANA DEPARTMENT OF TRANSPORTATION	
SLAB BRIDGE FLOOR DRAIN DETAIL	
SEPTEMBER 2004	
STANDARD DRAWING NO. E 704-SBFD-01	
DESIGN STANDARDS ENGINEER	DATE
	CHIEF HIGHWAY ENGINEER
	DATE

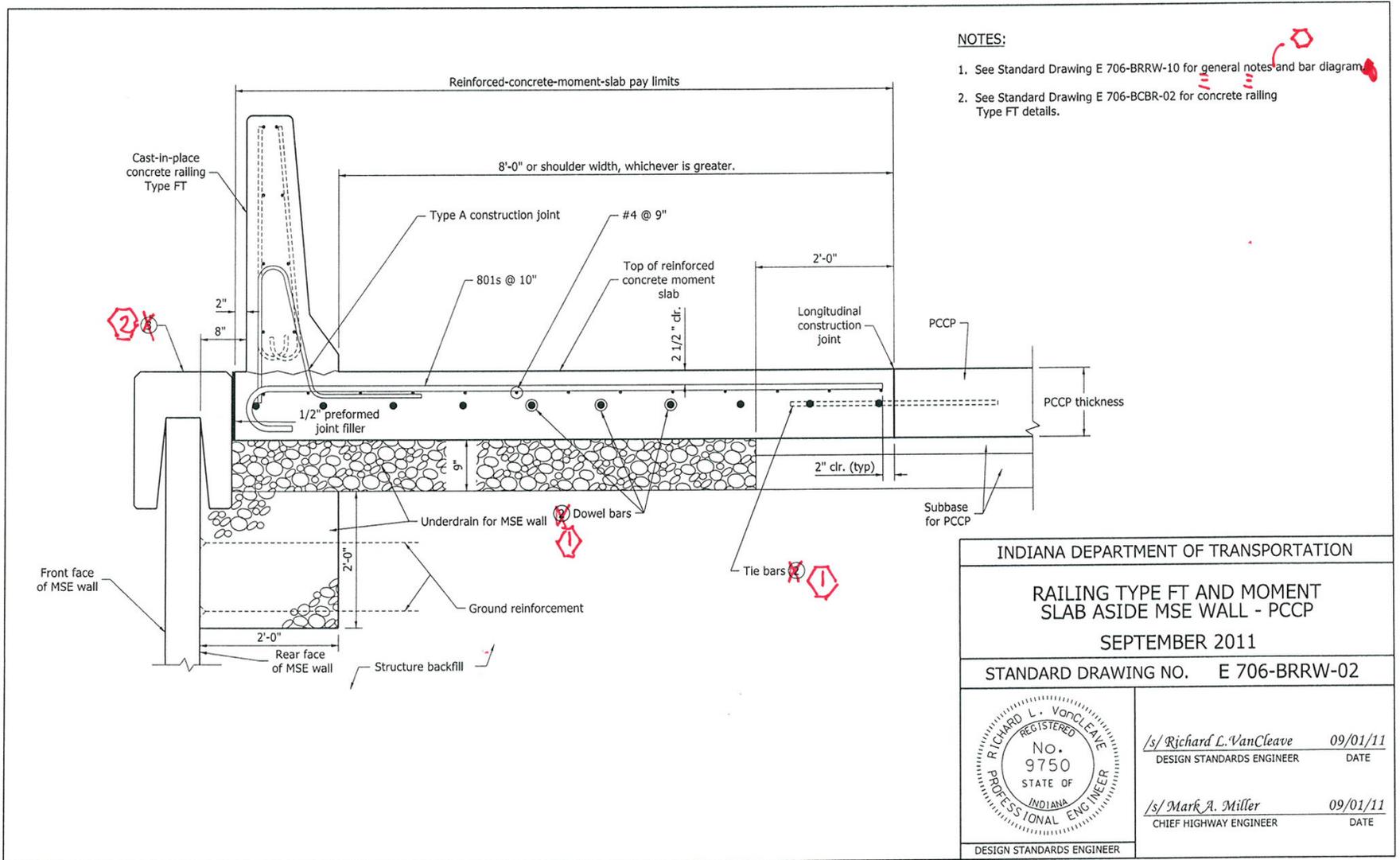
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-01 RAILING TYPE FC AND MOMENT SLAB ASIDE MSE WALL - PCCP (WITH MARKUPS)



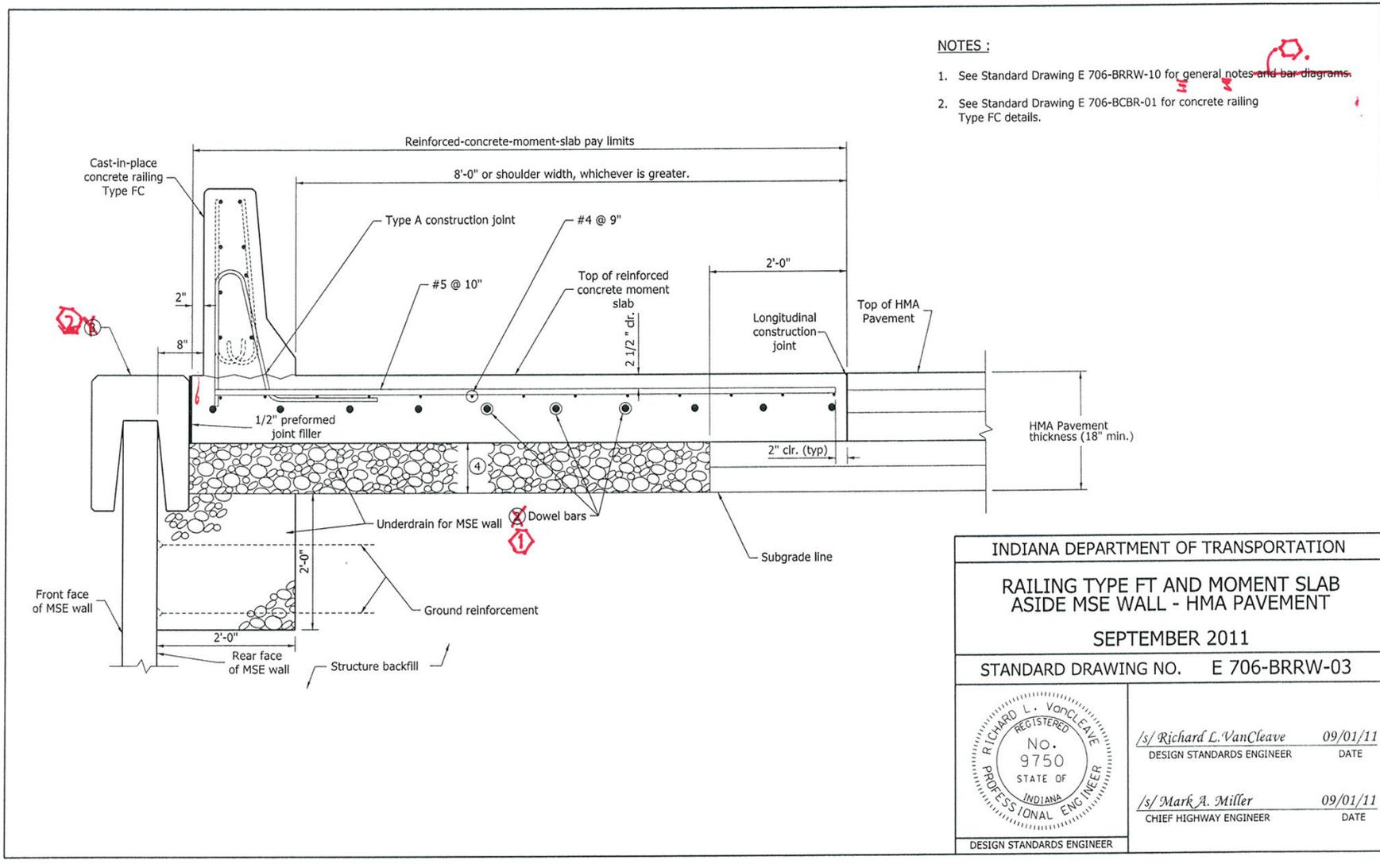
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-02 RAILING TYPE FT AND MOMENT SLAB ASIDE MSE WALL - PCCP (WITH MARKUPS)



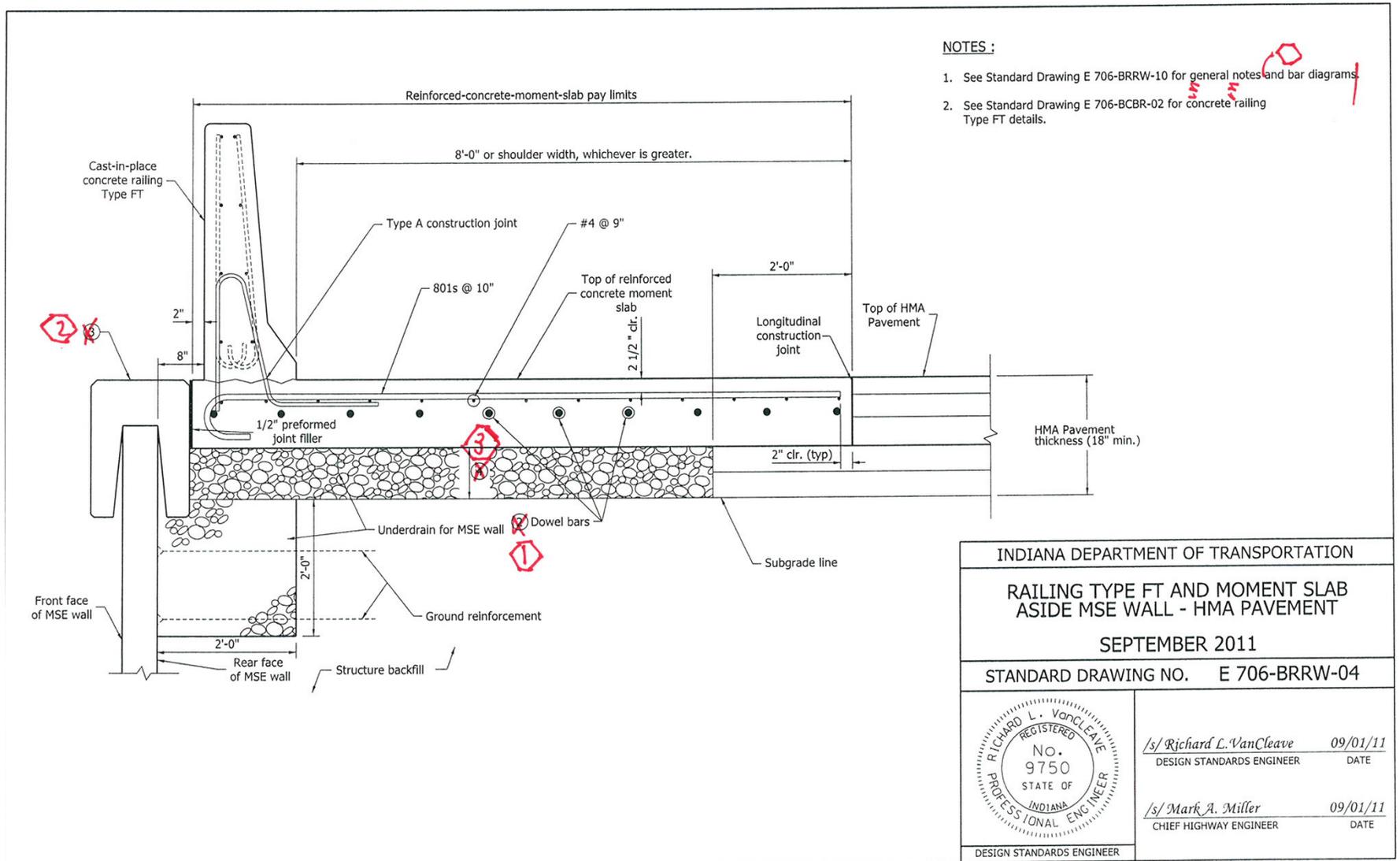
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-03 RAILING TYPE FT AND MOMENT SLAB ASIDE MSE WALL - HMA PAVEMENT (WITH MARKUPS)



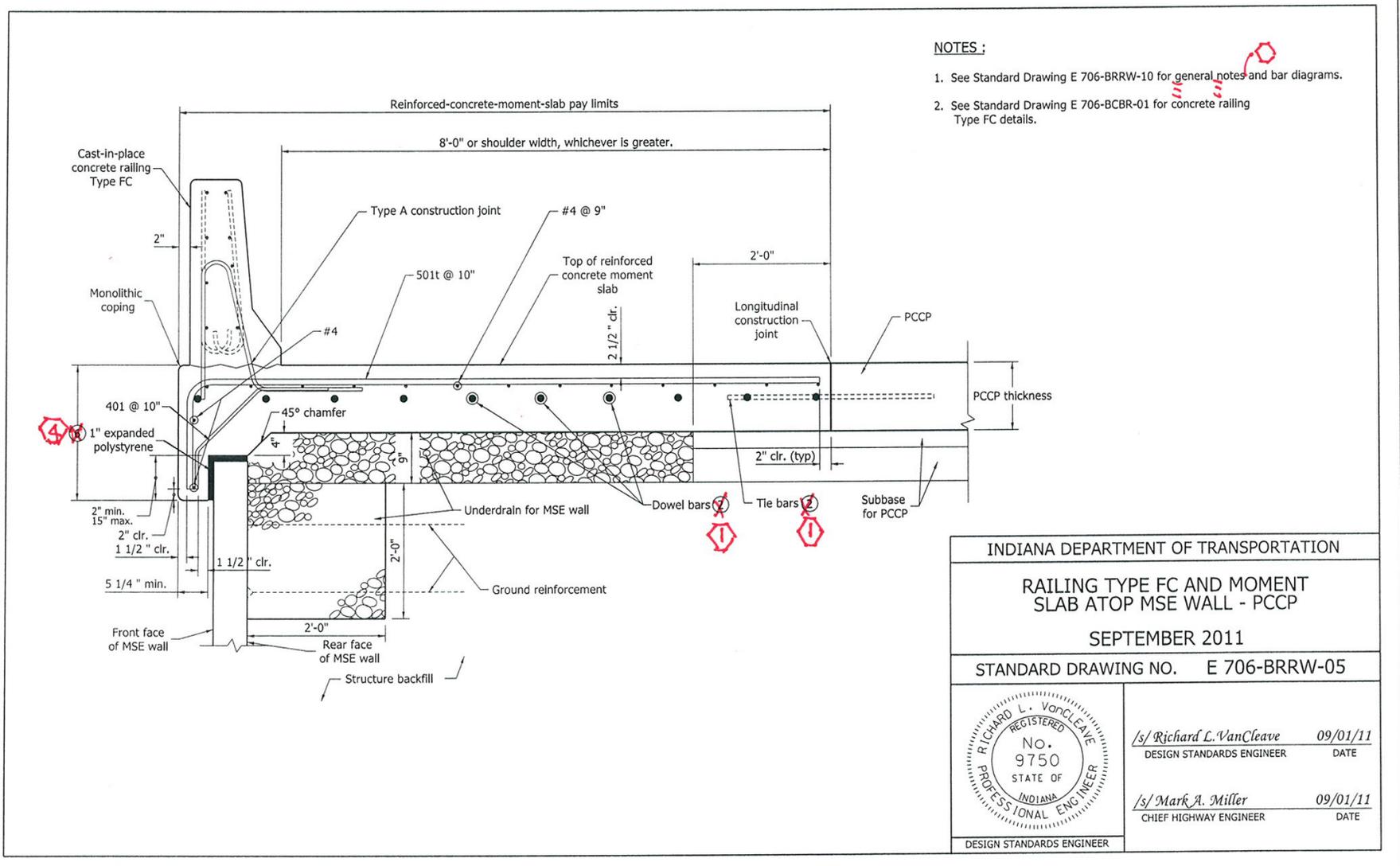
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-04 RAILING TYPE FT AND MOMENT SLAB ASIDE MSE WALL - HMA PAVEMENT (WITH MARKUPS)



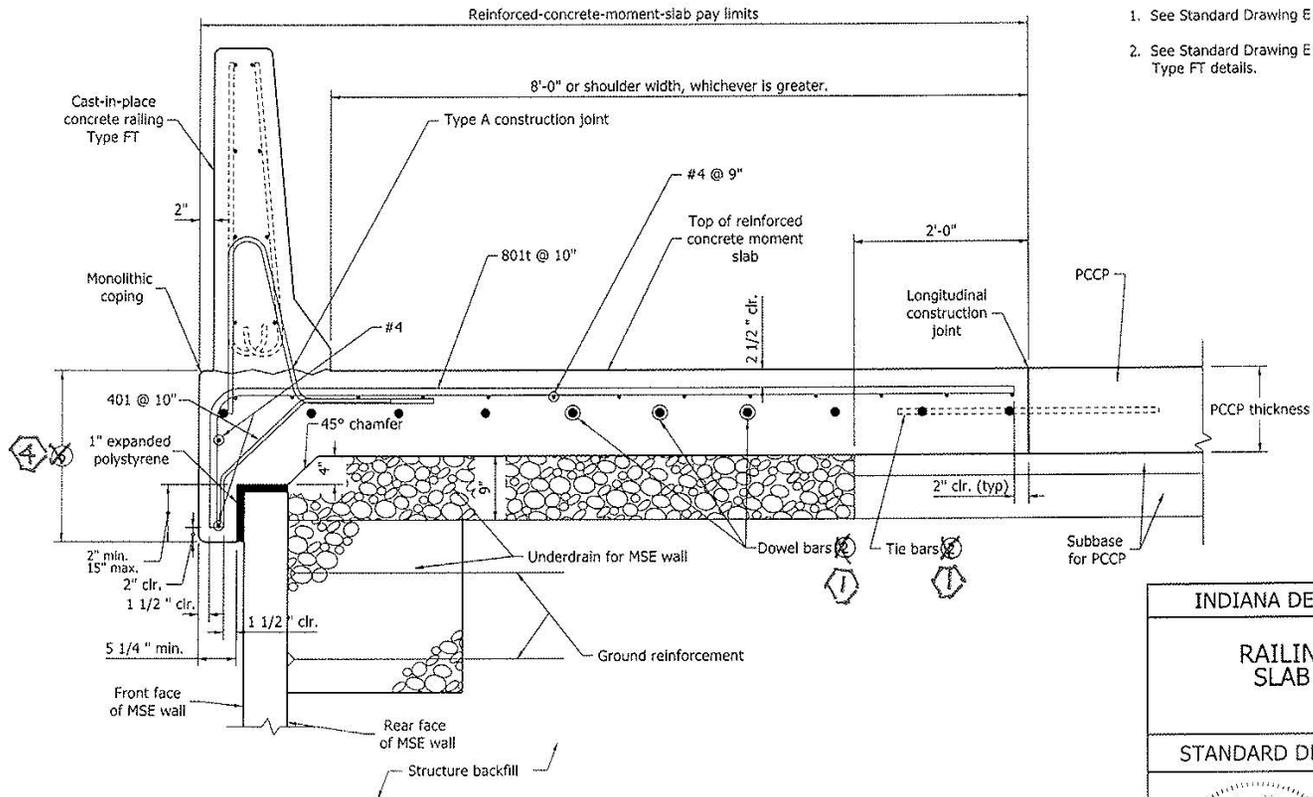
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-05 RAILING TYPE FC AND MOMENT SLAB ATOP MSE WALL - PCCP (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-06 RAILING TYPE FT AND MOMENT SLAB ATOP MSE WALL - PCCP (WITH MARKUPS)



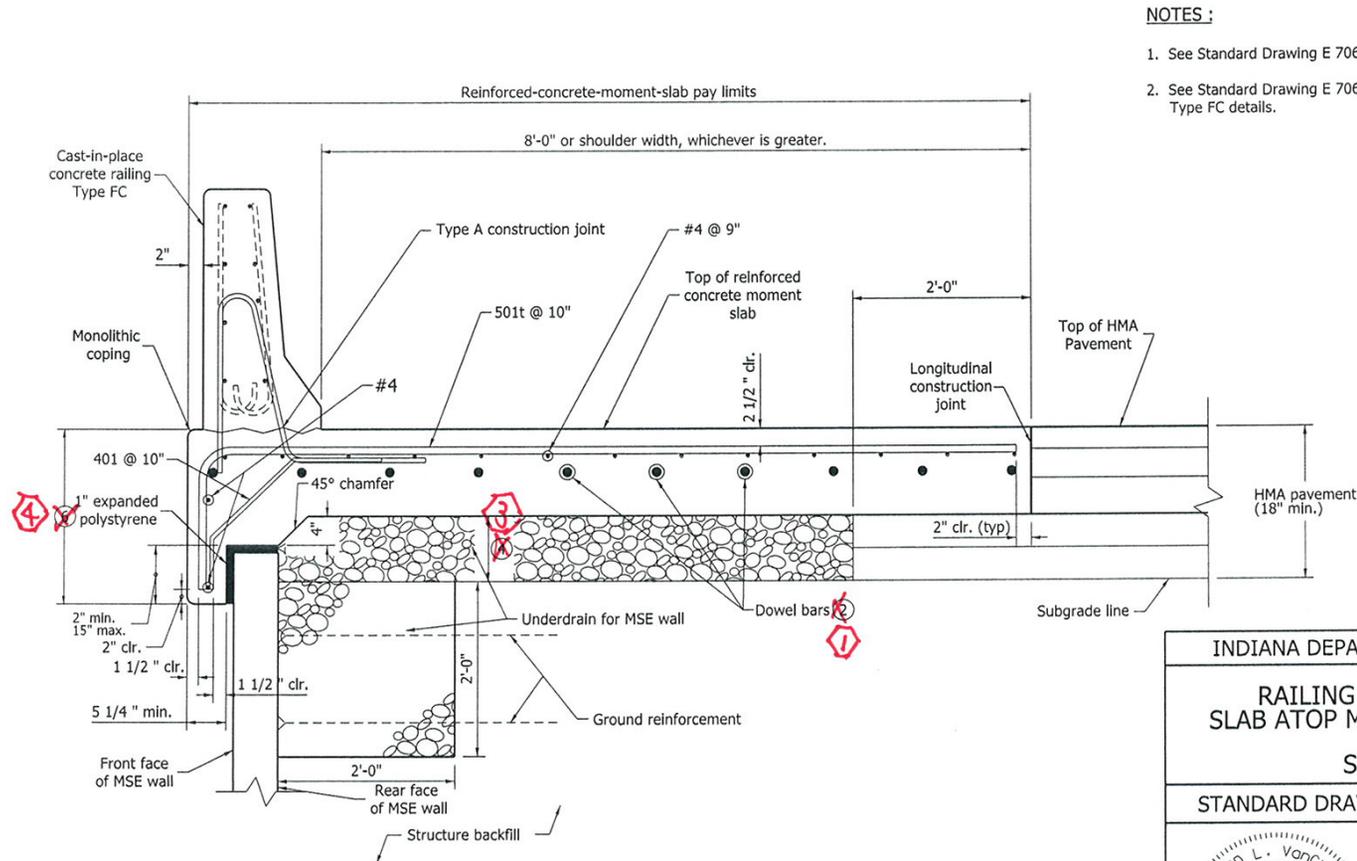
NOTES :

1. See Standard Drawing E 706-BRRW-10 for general notes and bar diagrams.
2. See Standard Drawing E 706-BCBR-02 for concrete railing Type FT details.

INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING TYPE FT AND MOMENT SLAB ATOP MSE WALL - PCCP	
SEPTEMBER 2011	
STANDARD DRAWING NO. E 706-BRRW-06	
	/s/ Richard L. VanCleave      09/01/11 DESIGN STANDARDS ENGINEER      DATE
	/s/ Mark A. Miller      09/01/11 CHIEF HIGHWAY ENGINEER      DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-07 RAILING TYPE FC AND MOMENT SLAB ATOP MSE WALL - HMA PAVEMENT (WITH MARKUPS)



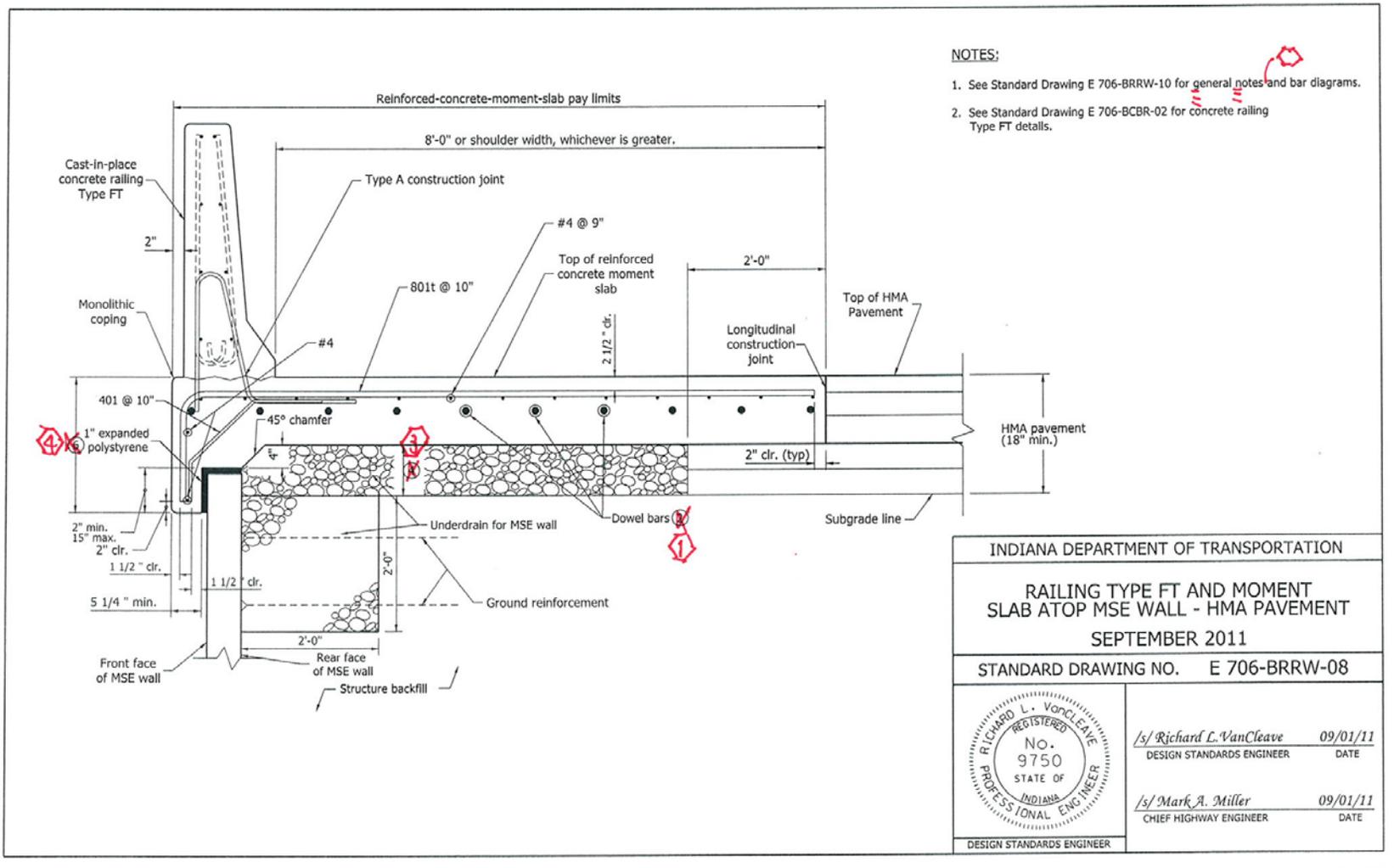
NOTES :

1. See Standard Drawing E 706-BRRW-10 for general notes and bar diagrams.
2. See Standard Drawing E 706-BCBR-01 for concrete railing Type FC details.

INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING TYPE FC AND MOMENT SLAB ATOP MSE WALL - HMA PAVEMENT	
SEPTEMBER 2011	
STANDARD DRAWING NO. E 706-BRRW-07	
	/s/ Richard L. VanCleave      09/01/11 DESIGN STANDARDS ENGINEER      DATE
DESIGN STANDARDS ENGINEER	/s/ Mark A. Miller      09/01/11 CHIEF HIGHWAY ENGINEER      DATE

REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-08 RAILING TYPE FT AND MOMENT SLAB ATOP MSE WALL - HMA PAVEMENT (WITH MARKUPS)



NO CHANGE TO DWG -09

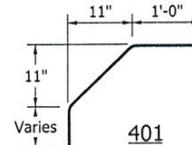
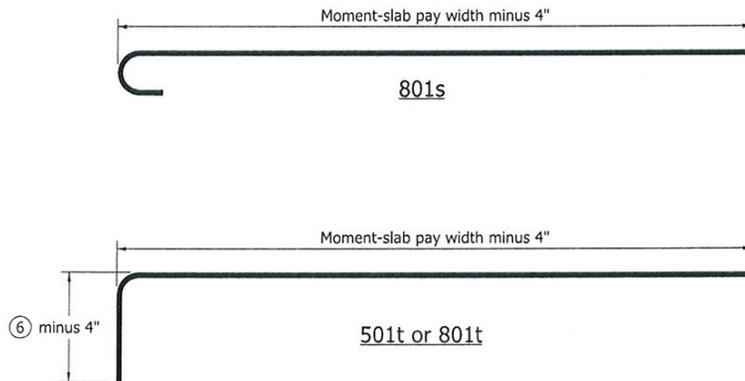
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRRW-10 RAILING AND MOMENT SLAB AT MSE WALL (WITH MARKUPS)

GENERAL NOTES:

To STD SPEC 706

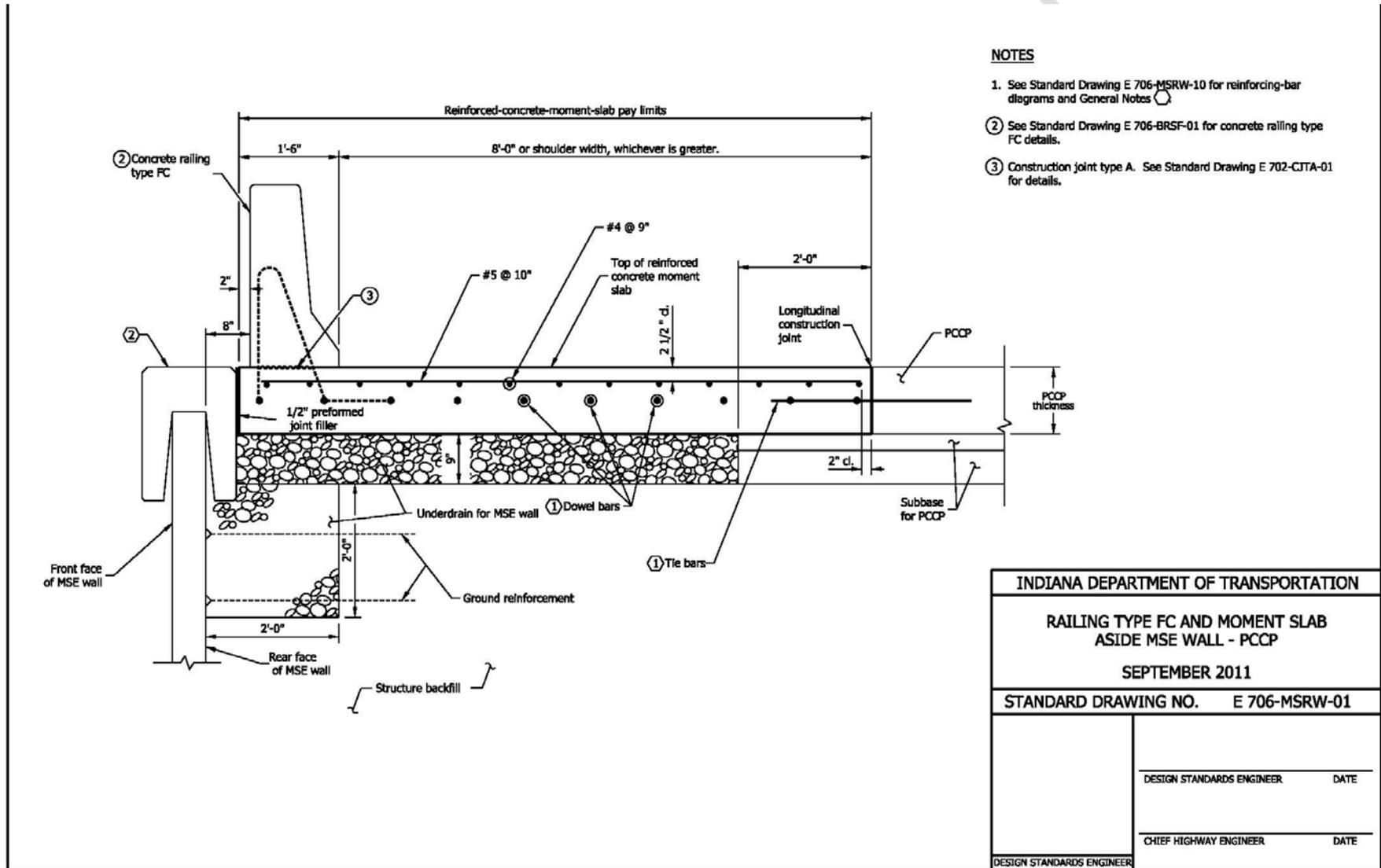
1. ~~The locations of the transverse joints in the moment slab and the railing shall be the same.~~
2. ~~See Standard Drawing E 706-BRRW-09 for plan view and additional reinforcing bars in the railing at the railing joints.~~
3. ~~The coping by be precast or cast in place. See Standard Drawing E 731-BRRW-01 for coping details.~~
4. ~~The thickness of the coarse aggregate No. 8 shall be equal to the combined thicknesses of the first two lifts of HMA, but not less than 6 in.~~
5. ~~The moment-slab thickness shall match that of adjoining PCCP, but shall not be less than 12 in., regardless of pavement type.~~
6. For moment slab thickness  $\leq 15$  in., this shall be 2'-0".  
 For moment slab thickness  $> 15$  in., this shall be moment-slab thickness plus 12 in.
7. The moment slab shall be used only within the limits of the MSE wall.
8. Reinforcing bars in the moment slab shall be epoxy coated.



INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING AND MOMENT SLAB AT MSE WALL SEPTEMBER 2009	
STANDARD DRAWING NO. E 706-BRRW-10	
	/s/ Richard L. VanCleave      09/01/09 DESIGN STANDARDS ENGINEER      DATE
	/s/ Mark A. Miller      09/01/09 CHIEF HIGHWAY ENGINEER      DATE
DESIGN STANDARDS ENGINEER	

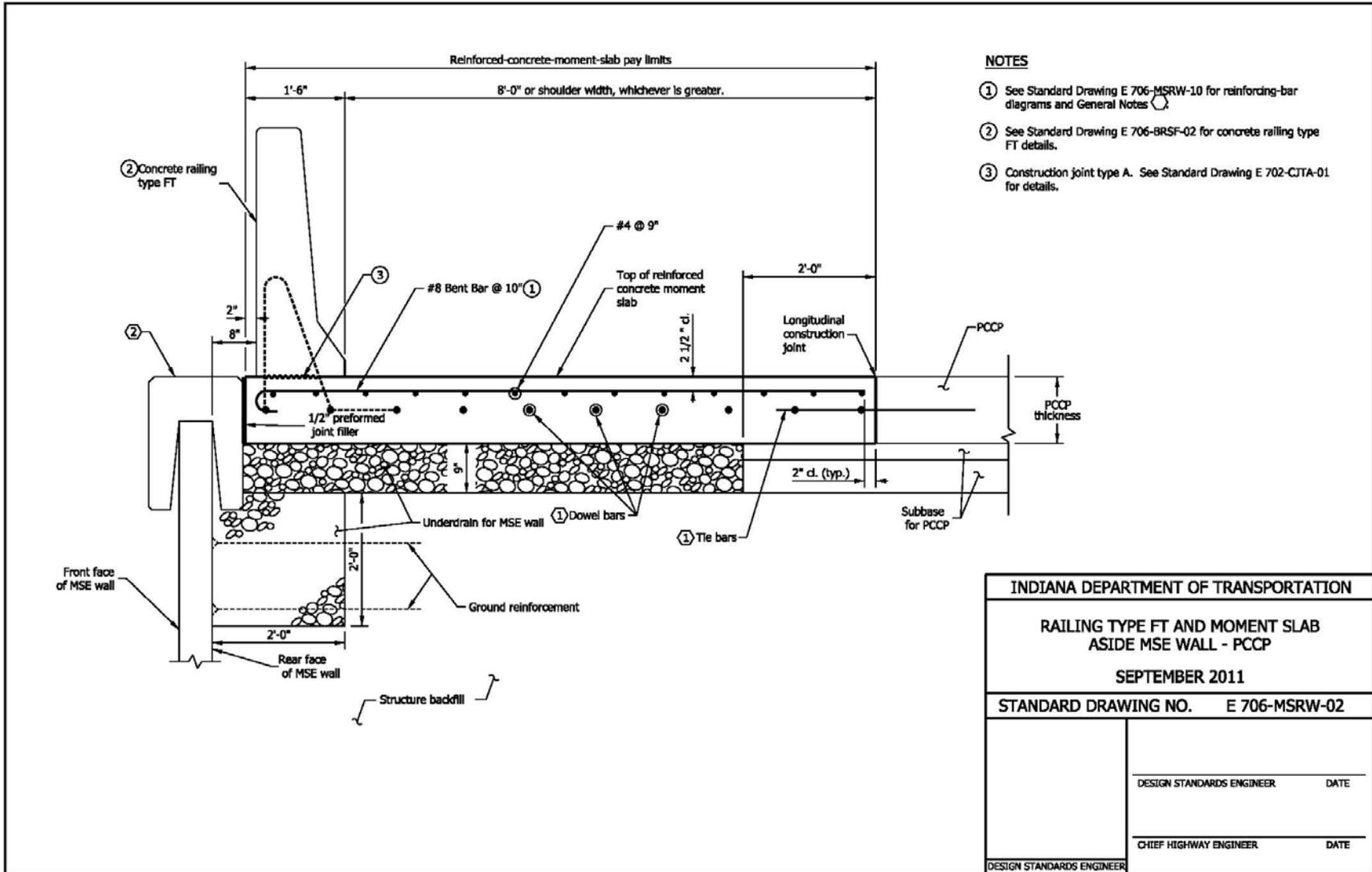
REVISION TO STANDARD DRAWINGS

706-MSRW-01 RAILING TYPE FC AND MOMENT SLAB ASIDE MSE WALL - PCCP (DRAFT)



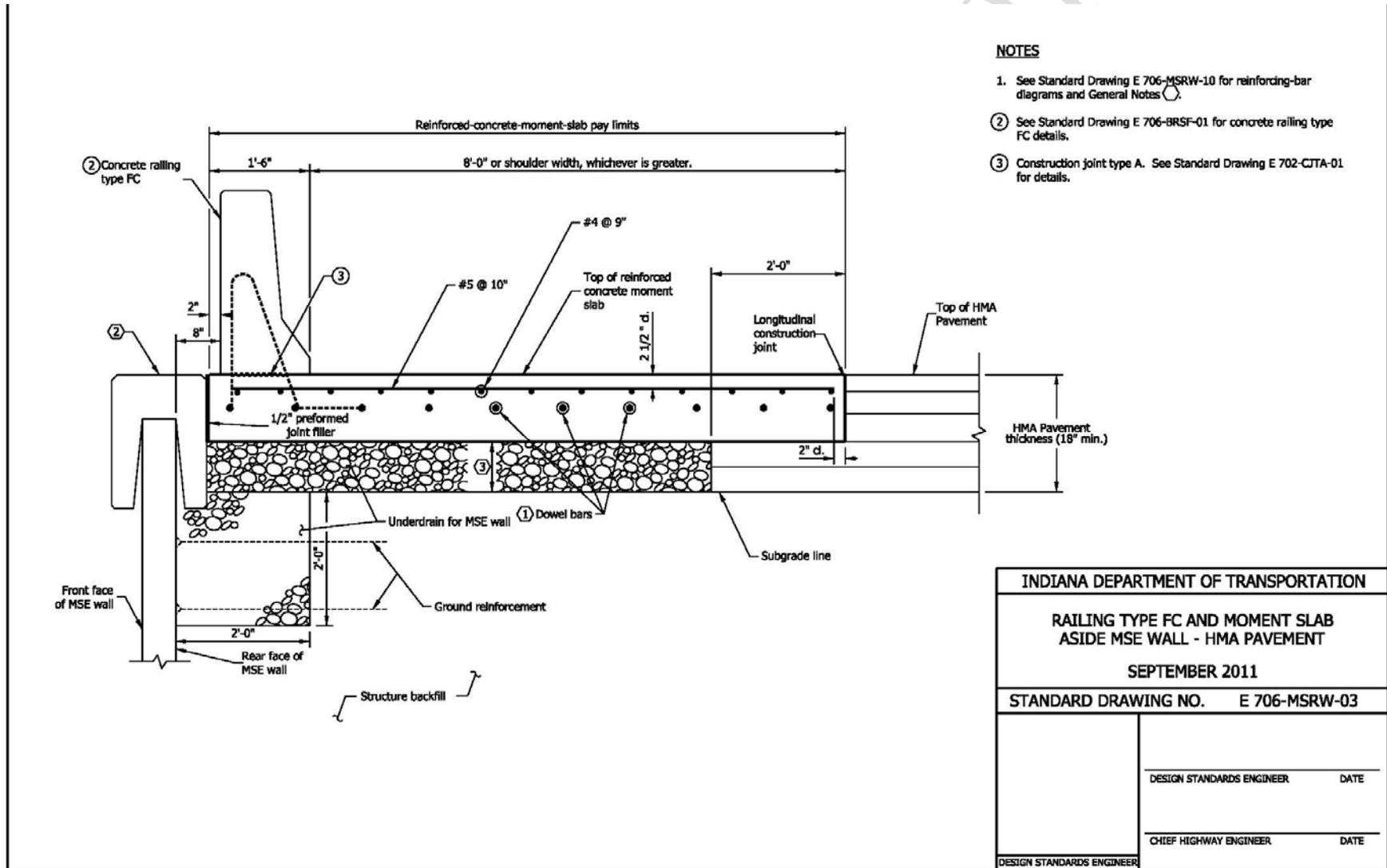
REVISION TO STANDARD DRAWINGS

706-MSRW-02 RAILING TYPE FT AND MOMENT SLAB ASIDE MSE WALL - PCCP (DRAFT)



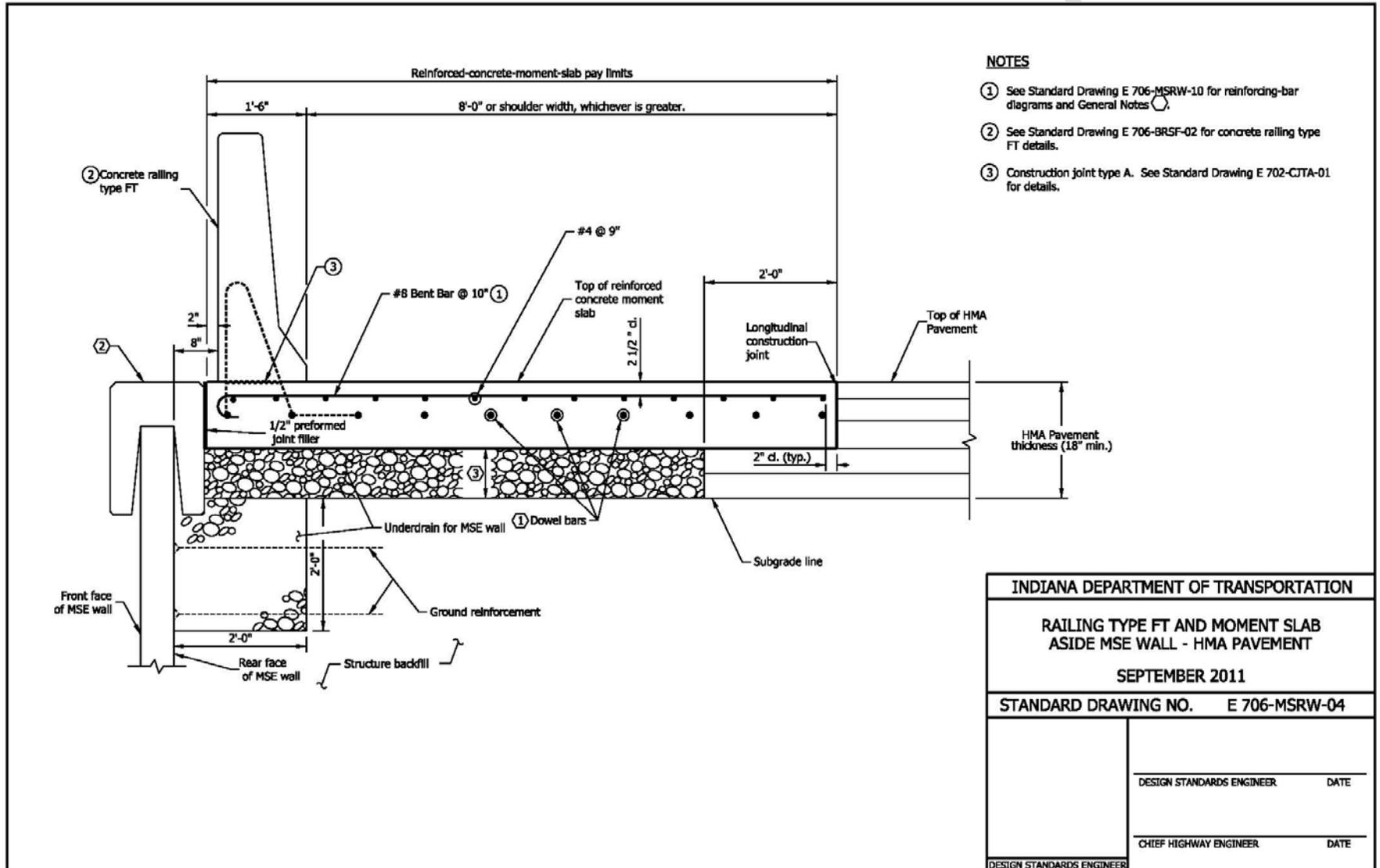
REVISION TO STANDARD DRAWINGS

706-MSRW-03 RAILING TYPE FC AND MOMENT SLAB ASIDE MSE WALL - HMA PAVEMENT (DRAFT)



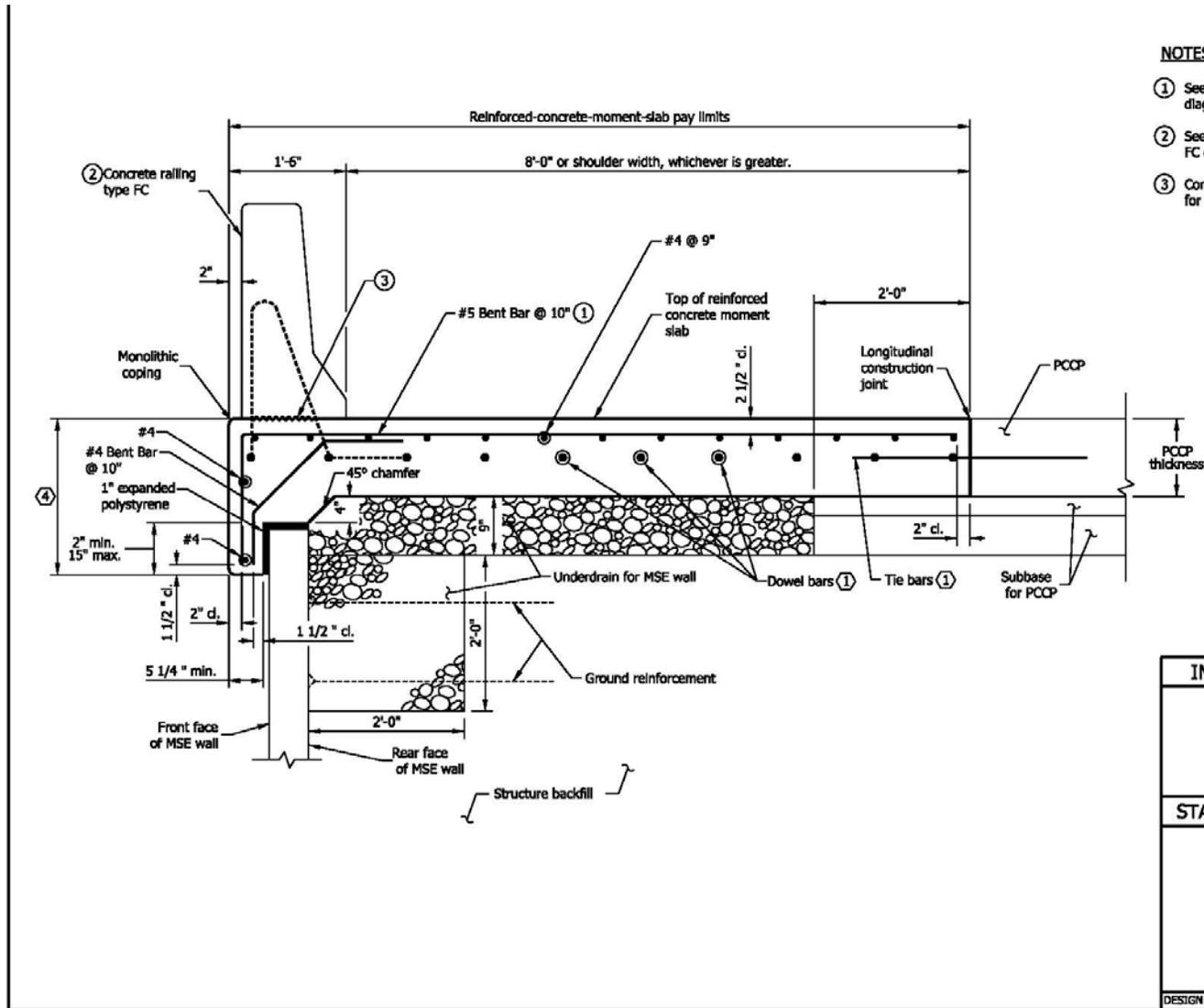
REVISION TO STANDARD DRAWINGS

706-MSRW-04 RAILING TYPE FT AND MOMENT SLAB ASIDE MSE WALL - HMA PAVEMENT (DRAFT)



REVISION TO STANDARD DRAWINGS

706-MSRW-05 RAILING TYPE FC AND MOMENT SLAB ATOP MSE WALL - PCCP (DRAFT)



NOTES

- ① See Standard Drawing E 706-MSRW-10 for reinforcing-bar diagrams and General Notes.
- ② See Standard Drawing E 706-BRSF-01 for concrete railing type FC details.
- ③ Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.

INDIANA DEPARTMENT OF TRANSPORTATION

RAILING TYPE FC AND MOMENT SLAB  
 ATOP MSE WALL - PCCP

SEPTEMBER 2011

STANDARD DRAWING NO. E 706-MSRW-05

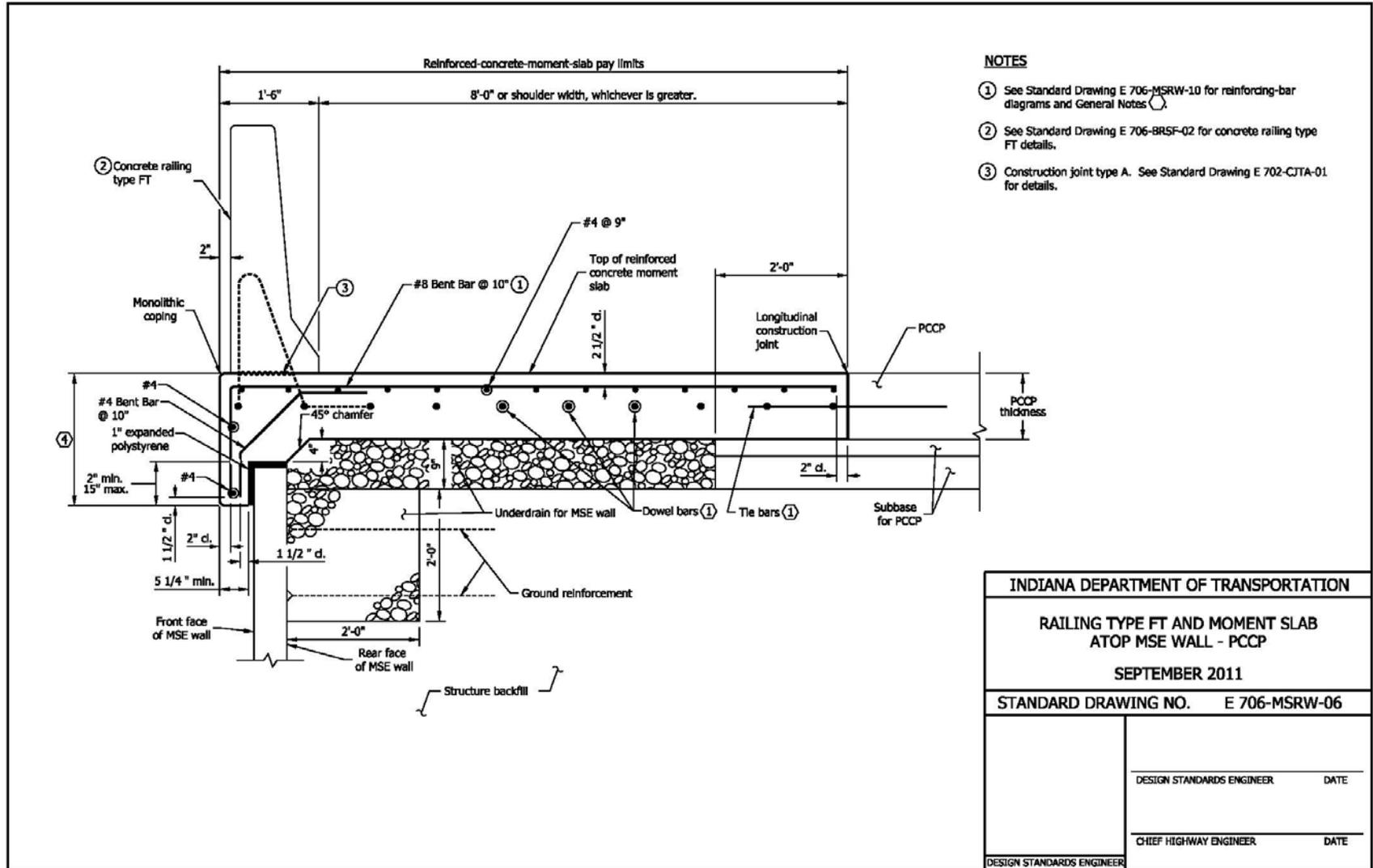
DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

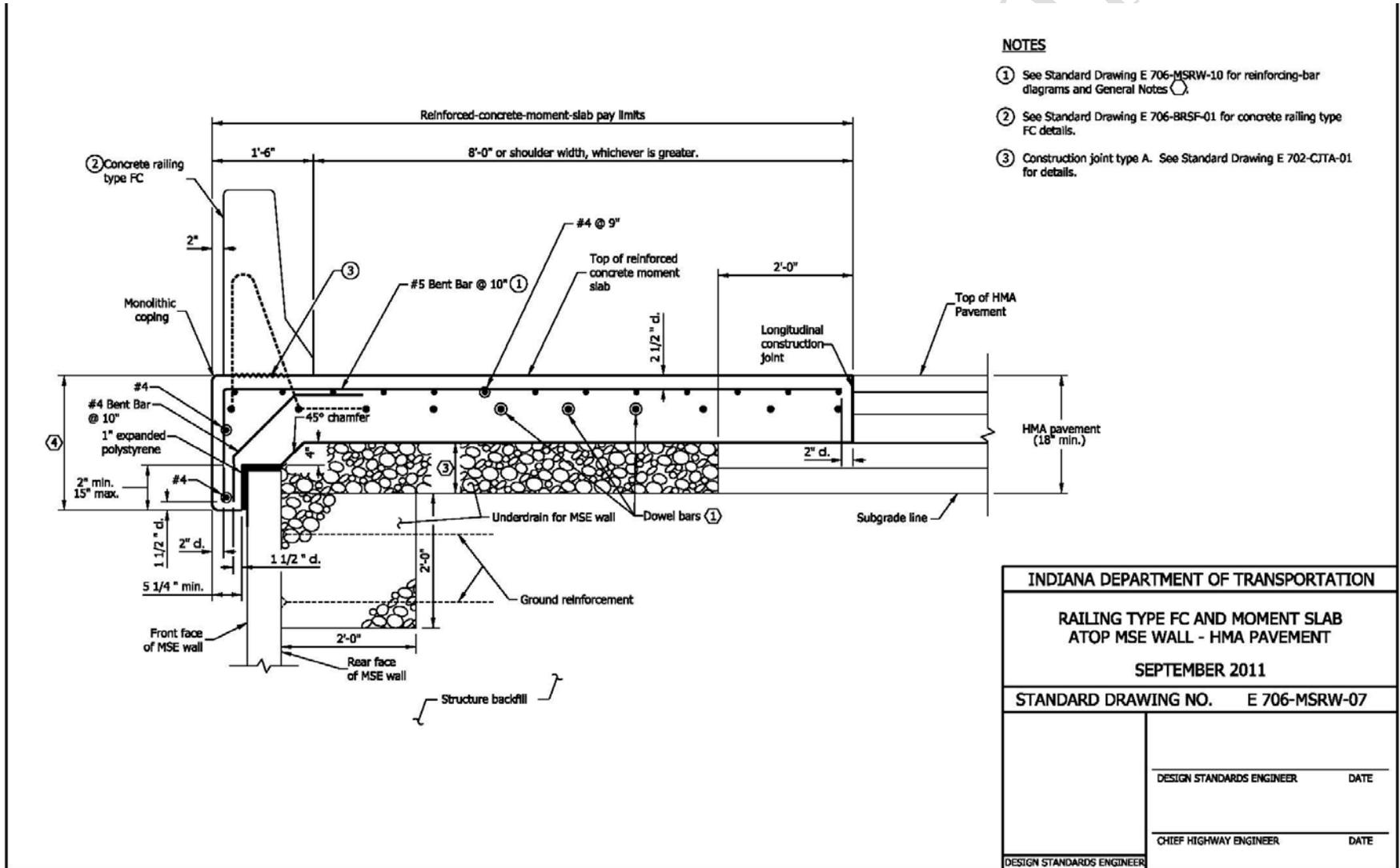
REVISION TO STANDARD DRAWINGS

706-MSRW-06 RAILING TYPE FT AND MOMENT SLAB ATOP MSE WALL - PCCP (DRAFT)



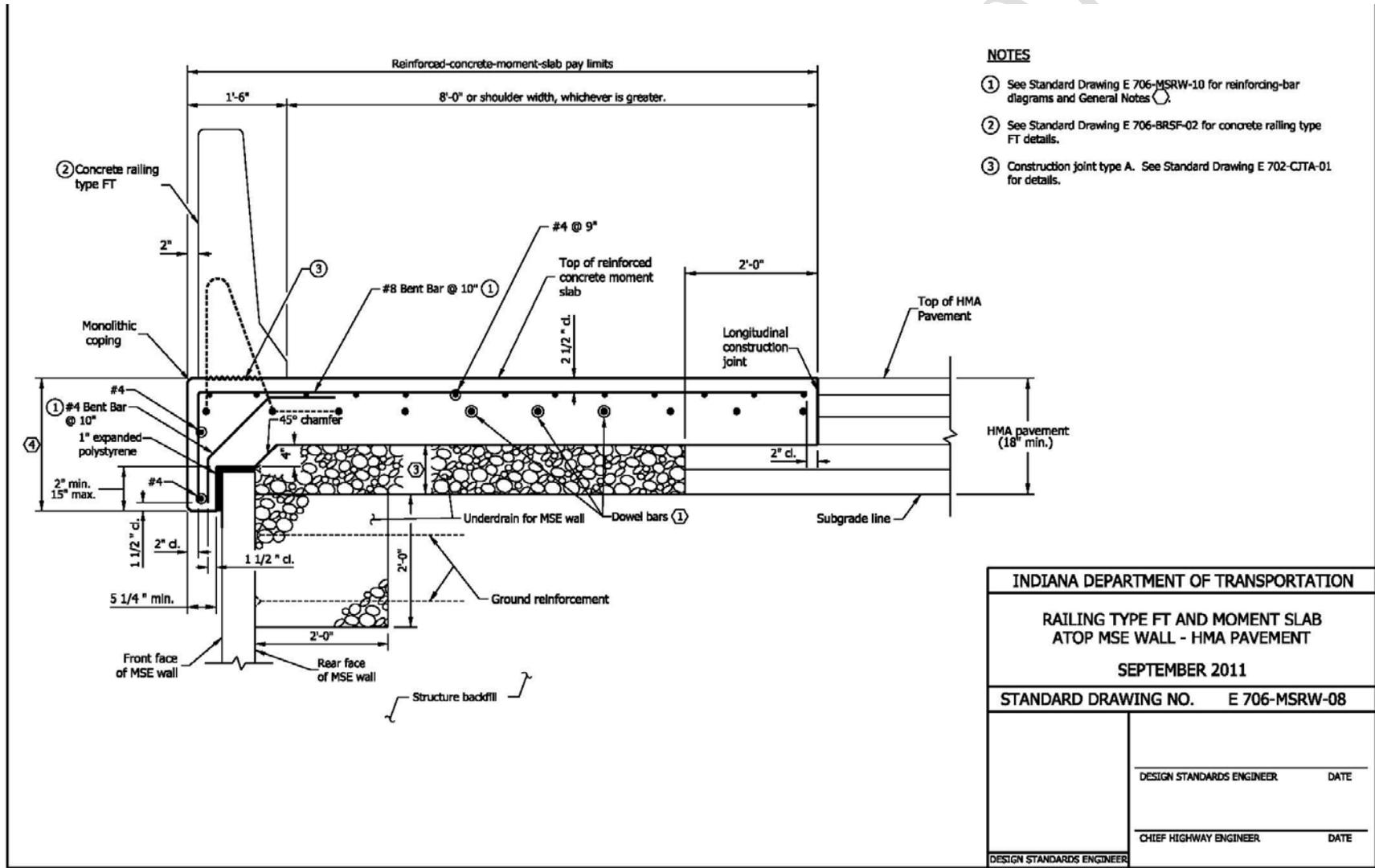
REVISION TO STANDARD DRAWINGS

706-MSRW-07 RAILING TYPE FC AND MOMENT SLAB ATOP MSE WALL - HMA PAVEMENT (DRAFT)



REVISION TO STANDARD DRAWINGS

706-MSRW-08 RAILING TYPE FT AND MOMENT SLAB ATOP MSE WALL - HMA PAVEMENT (DRAFT)



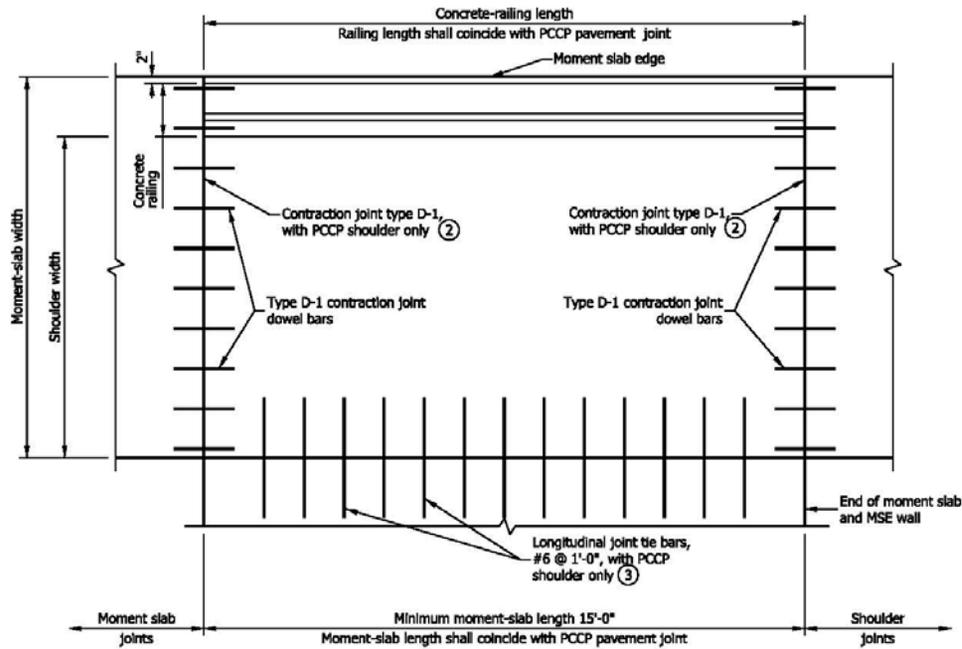
NOTES

- ① See Standard Drawing E 706-MSRW-10 for reinforcing-bar diagrams and General Notes.
- ② See Standard Drawing E 706-BRSF-02 for concrete railing type FT details.
- ③ Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.

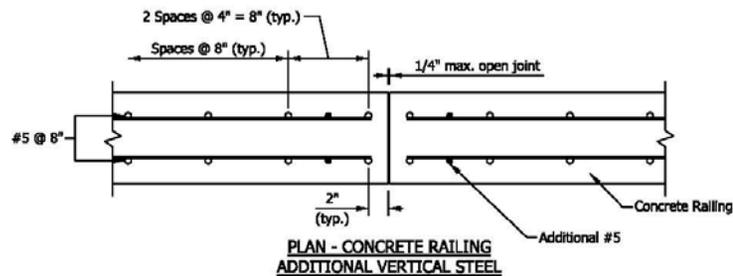
INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING TYPE FT AND MOMENT SLAB ATOP MSE WALL - HMA PAVEMENT	
SEPTEMBER 2011	
STANDARD DRAWING NO. E 706-MSRW-08	
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

706-MSRW-09 MOMENT SLAB JOINTS (DRAFT)



PLAN - REINFORCED CONCRETE MOMENT SLAB JOINTS



PLAN - CONCRETE RAILING  
 ADDITIONAL VERTICAL STEEL

**NOTES**

1. Where used with HMA mainline pavement, concrete railing and moment-slab lengths shall coincide and be spaced at 18'-0".
- ② See Standard Drawing E 503-CCP1-01 for contraction joint type D-1 details.
- ③ See Standard Drawing E 503-CCP1-02 for joint tie bars details.

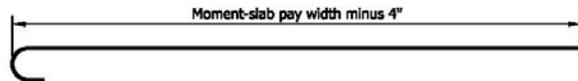
<b>INDIANA DEPARTMENT OF TRANSPORTATION</b>	
<b>MOMENT SLAB JOINTS</b>	
SEPTEMBER 2009	
STANDARD DRAWING NO. E 706-MSRW-09	
	DESIGN STANDARDS ENGINEER      DATE
	CHIEF HIGHWAY ENGINEER      DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

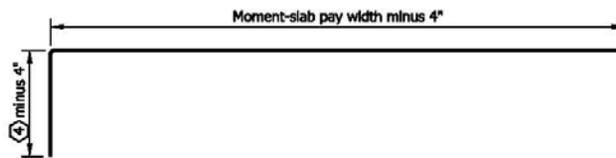
706-MSRW-10 RAILING AND MOMENT SLAB AT MSE WALL (DRAFT)

**GENERAL NOTES**

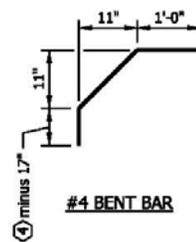
- ① See Standard Drawing E 706-MSRW-09 for plan view and additional reinforcing bars in the railing at the railing joints.
- ② See Standard Drawing E 731-MSEW-01 for coping details.
- ③ The thickness of the coarse aggregate No. 8 shall be equal to the combined thicknesses of the first two lifts of HMA, but not less than 6 in.
- ④ For moment slab thickness  $\leq 15$  in., this shall be 2'-0".  
 For moment slab thickness  $> 15$  in., this shall be moment-slab thickness plus 12 in.
5. The moment slab shall be used only within the limits of the MSE wall.
6. Reinforcing bars in the moment slab shall be epoxy coated.
7. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending diagrams and notes.



**#8 BENT BAR  
 WITH STANDARD 180° HOOK**



**#5 BENT BAR OR #8 BENT BAR  
 WITH STANDARD 90° BEND**

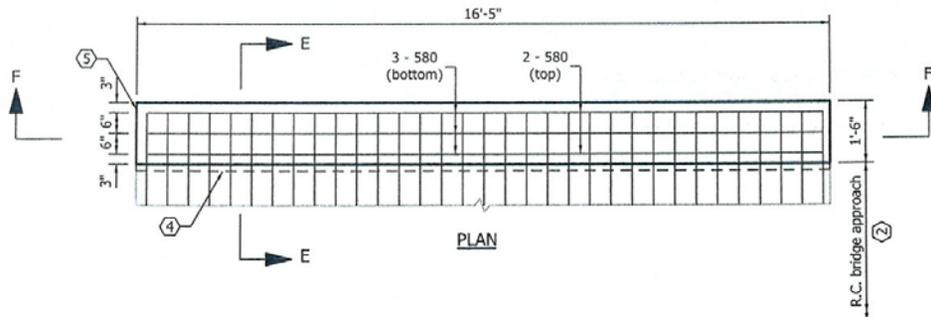


**#4 BENT BAR**

<b>INDIANA DEPARTMENT OF TRANSPORTATION</b>	
<b>RAILING AND MOMENT SLAB      AT MSE WALL</b>	
<b>SEPTEMBER 2009</b>	
<b>STANDARD DRAWING NO. E 706-MSRW-10</b>	
	DESIGN STANDARDS ENGINEER      DATE
	CHIEF HIGHWAY ENGINEER      DATE
<b>DESIGN STANDARDS ENGINEER</b>	

REVISION TO STANDARD DRAWINGS

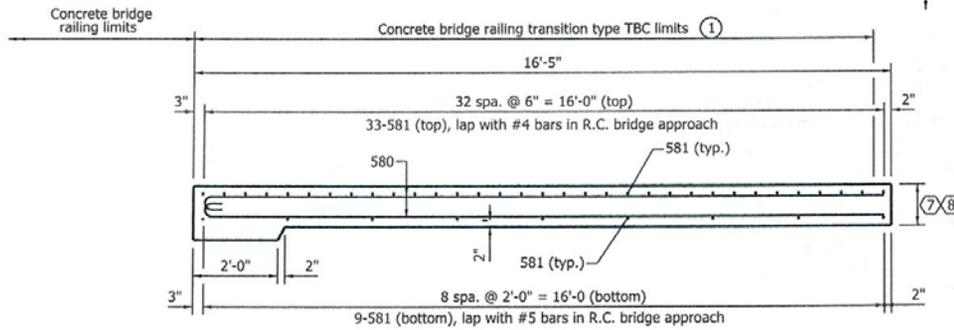
EXISTING 706-TASE-01 BRIDGE RAILING TRANSITION TBC SLAB EXTENSION (WITH MARKUPS)



NOTES

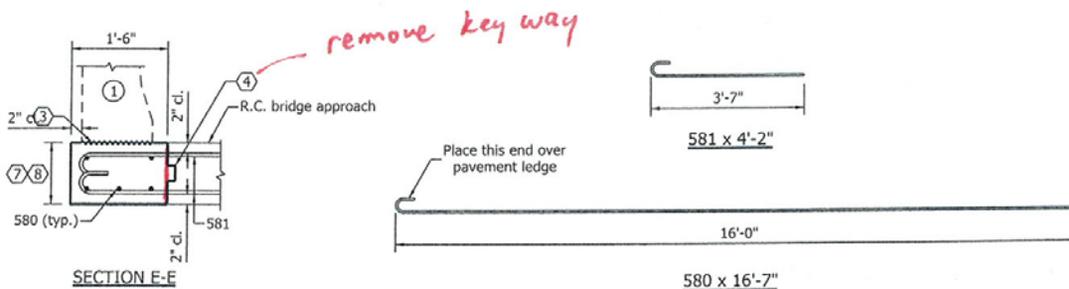
- ① See Standard Drawing E 706-TTBC-01 through -03 for concrete bridge railing transition type TBC details.
2. See Standard Drawing E 706-TASE-05 for General Notes ⑥.

*Note added for transitions*



SECTION F-F

BILL OF MATERIALS			
Quantities are for one side approach slab extension, TBC.			
EPOXY COATED REINFORCING STEEL			
Size & Mark	No. of Bars	Length	Weight (lb)
580	5	16'-7"	
581	42	4'-2"	
Total #5 bars			269
Total Epoxy Coated Steel			269
MISCELLANEOUS			
Concrete, Class C (per inch thickness)			2.7 sy

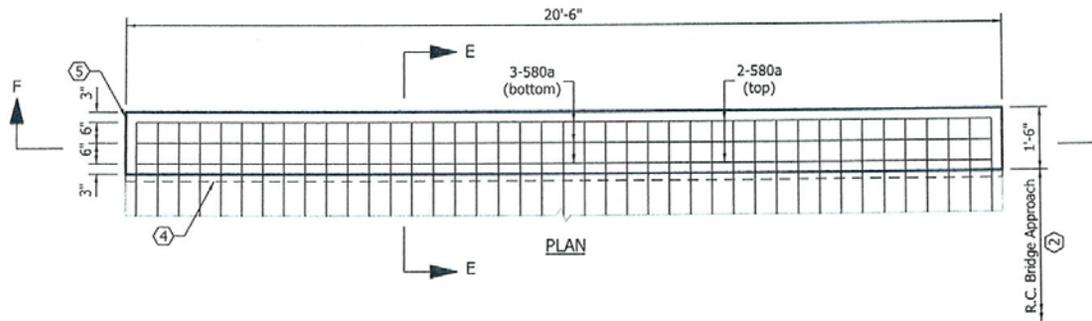


SECTION F-F

INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TRANSITION TBC SLAB EXTENSION	
MARCH 2005	
STANDARD DRAWING NO. E 706-TASE-01	
DESIGN STANDARDS ENGINEER	D.P.
CHIEF HIGHWAY ENGINEER	D.P.
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

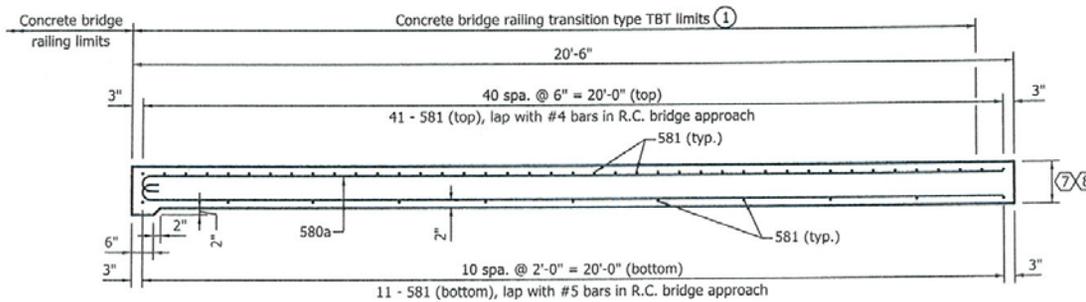
EXISTING 706-TASE-02 BRIDGE RAILING TRANSITION TBT SLAB EXTENSION (WITH MARKUPS)



NOTES

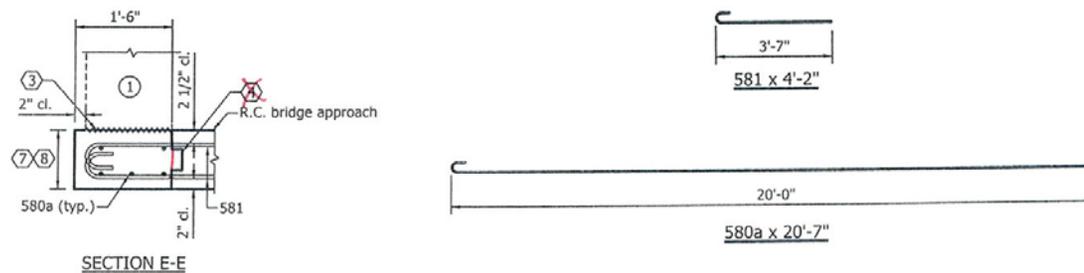
- ① See Standard Drawing E 706-TTBT-01 through -03 for concrete bridge railing transition type TBT details.
2. See Standard Drawing E 706-TASE-05 for General Notes

*Note for transitions added.*



BILL OF MATERIALS			
Quantities are for one side approach slab extension, TBT.			
EPOXY COATED REINFORCING STEEL			
Size & Mark	No. of Bars	Length	Weight (lb)
580a	5	20'-7"	
581	52	4'-2"	
Total #5 Bars			333
Total Epoxy Coated Steel			333
MISCELLANEOUS			
Concrete, Class C (per inch thickness)			3.4 sy

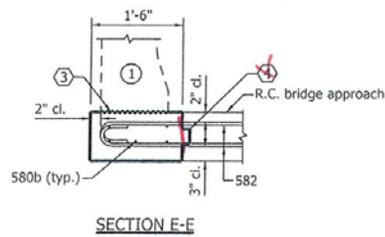
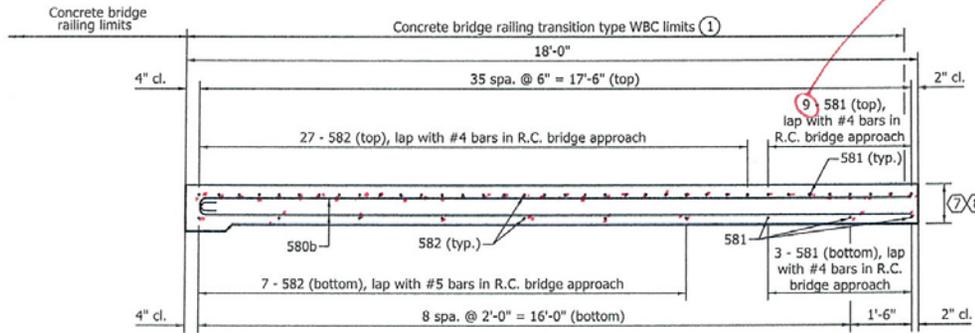
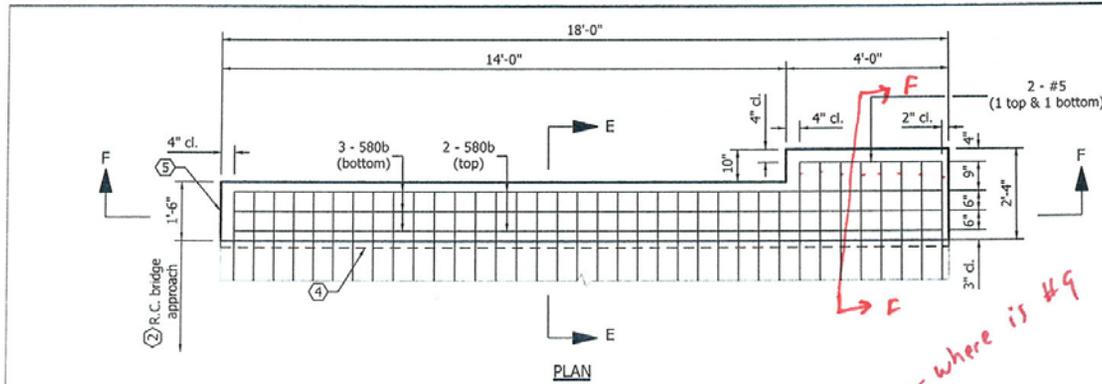
SECTION F-F



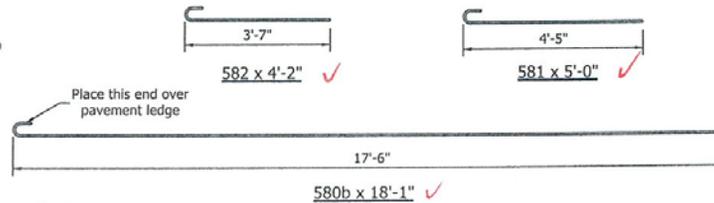
INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TRANSITION TBT SLAB EXTENSION	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 706-TASE-02
DESIGN STANDARDS ENGINEER	D.
CHIEF HIGHWAY ENGINEER	D.
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

EXISTING 706-TASE-03 BRIDGE RAILING TRANSITION WBC SLAB EXTENSION (WITH MARKUPS)



SECTION F-F



section F-F added.

NOTES

- See Standard Drawing E 706-TWBC-01 through -03 for concrete bridge railing transition WBC details.
- See Standard Drawing E 706-TASE-05 for General Notes.

Bill revised.

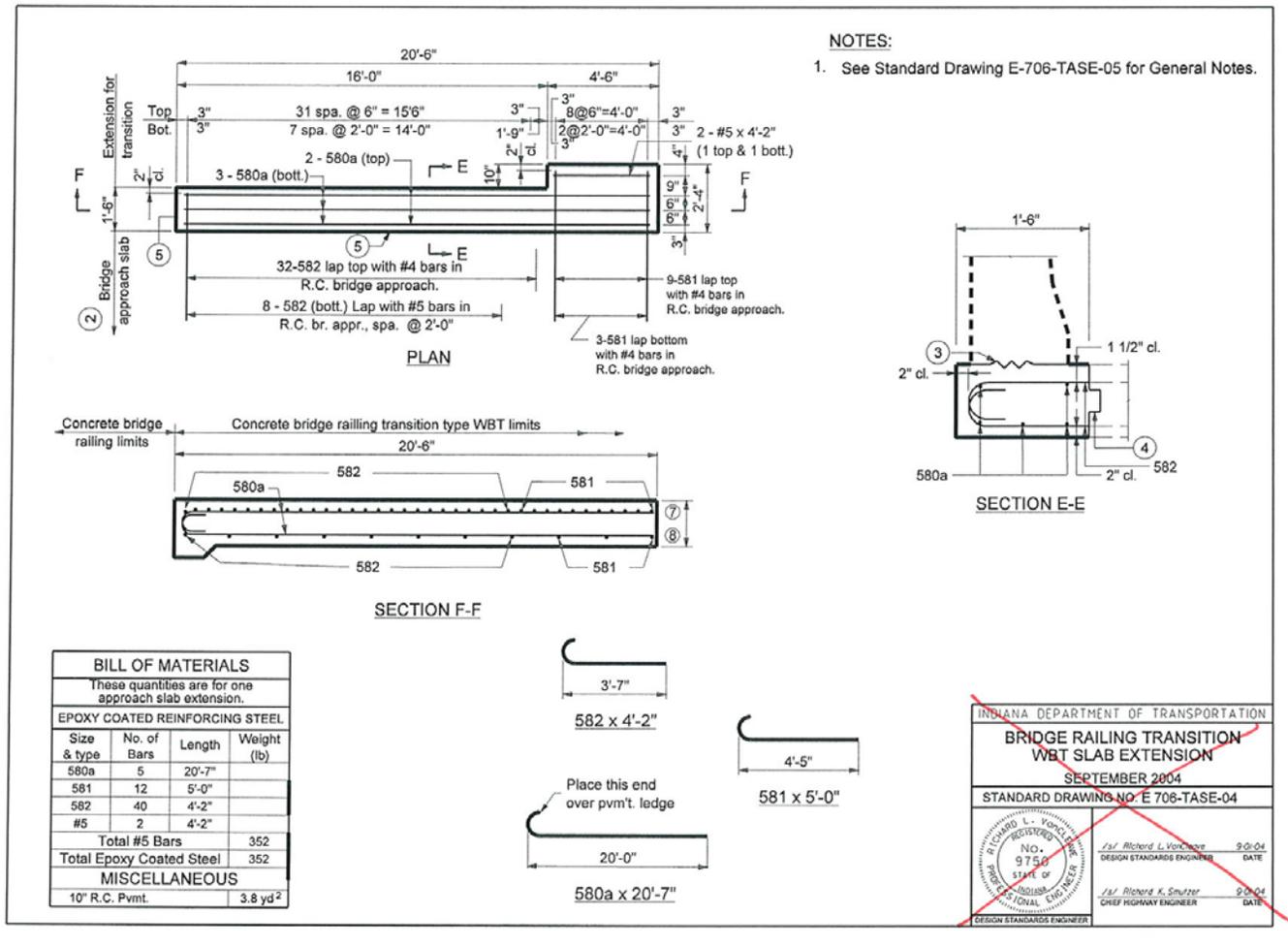
11  
35

BILL OF MATERIALS			
Quantities are for one side approach slab extension, WBC.			
EPOXY COATED REINFORCING STEEL			
Size & Mark	No. of Bars	Length	Weight (lb)
580b	5	18'-1"	
581	12	5'-0"	
582	34	4'-2"	
#5	2	3'-8"	
Total #5 bars			312
Total Epoxy Coated Steel			312
MISCELLANEOUS			
Concrete, Class C (per inch thickness)			3.4 sy

INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TRANSITION WBC SLAB EXTENSION	
SEPTEMBER 2004	
STANDARD DRAWING NO.	E 706-TASE-03
DESIGN STANDARDS ENGINEER	DA
CHIEF HIGHWAY ENGINEER	DA
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

EXISTING 706-TASE-04 BRIDGE RAILING TRANSITION WBT SLAB EXTENSION (PROPOSED TO DELETE)



*Transition for railing that does not exist*

REVISION TO STANDARD DRAWINGS

EXISTING 706-TASE-05 BRIDGE RAILING TRANSITION SLAB EXTENSION GENERAL NOTES (WITH MARKUPS)

NOTES

1. The reinforced concrete bridge approach extension details are only for the limits of the concrete bridge railing transition and shall only apply when the transition is located along the bridge approach slab, adjacent to the bridge. If the transition is positioned along the bridge approach slab, at a location away from the bridge, then the details for the bridge approach slab extension shall be as shown on the plans.
- ② See Standard Drawings E 609-RCBA-01 through -07 for details for the reinforced concrete bridge approach.
- ③ Type A construction joint. See Standard Drawing E 702-CJTA-01 for details.
- ④ Optional nominal 2" x 4" keyway construction joint.
- ⑤ This end of the reinforced concrete bridge approach extension shall match the construction at the bridge end as shown on the plans.
6. See Standard Drawing E 703-BRST-01 for bar bending details and reinforcing bar notes.
- ⑦ See Standard Drawing E 609-RCBA-01 for thickness of bridge approach slab to be used with asphalt pavement.
- ⑧ See Standard Drawing E 609-RCBA-02 for thickness of bridge approach slab to be used with a terminal joint and Portland cement concrete pavement.

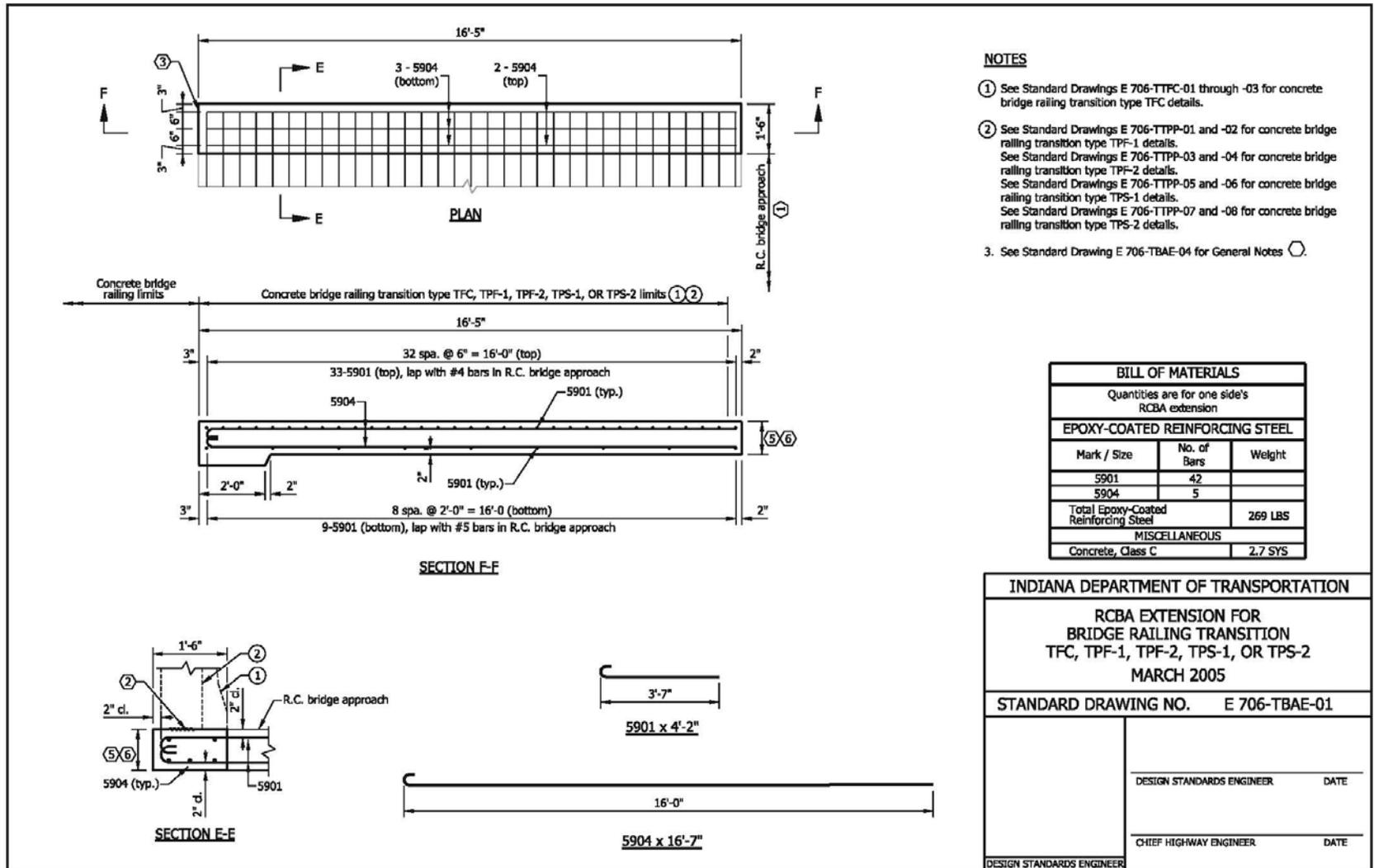
*note deleted*

*Remove note*

INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TRANSITION SLAB EXTENSION GENERAL NOTES SEPTEMBER 2007	
STANDARD DRAWING NO. E 706-TASE-05	
	DESIGN STANDARDS ENGINEER D/S
	CHIEF HIGHWAY ENGINEER D/S
	DESIGN STANDARDS ENGINEER

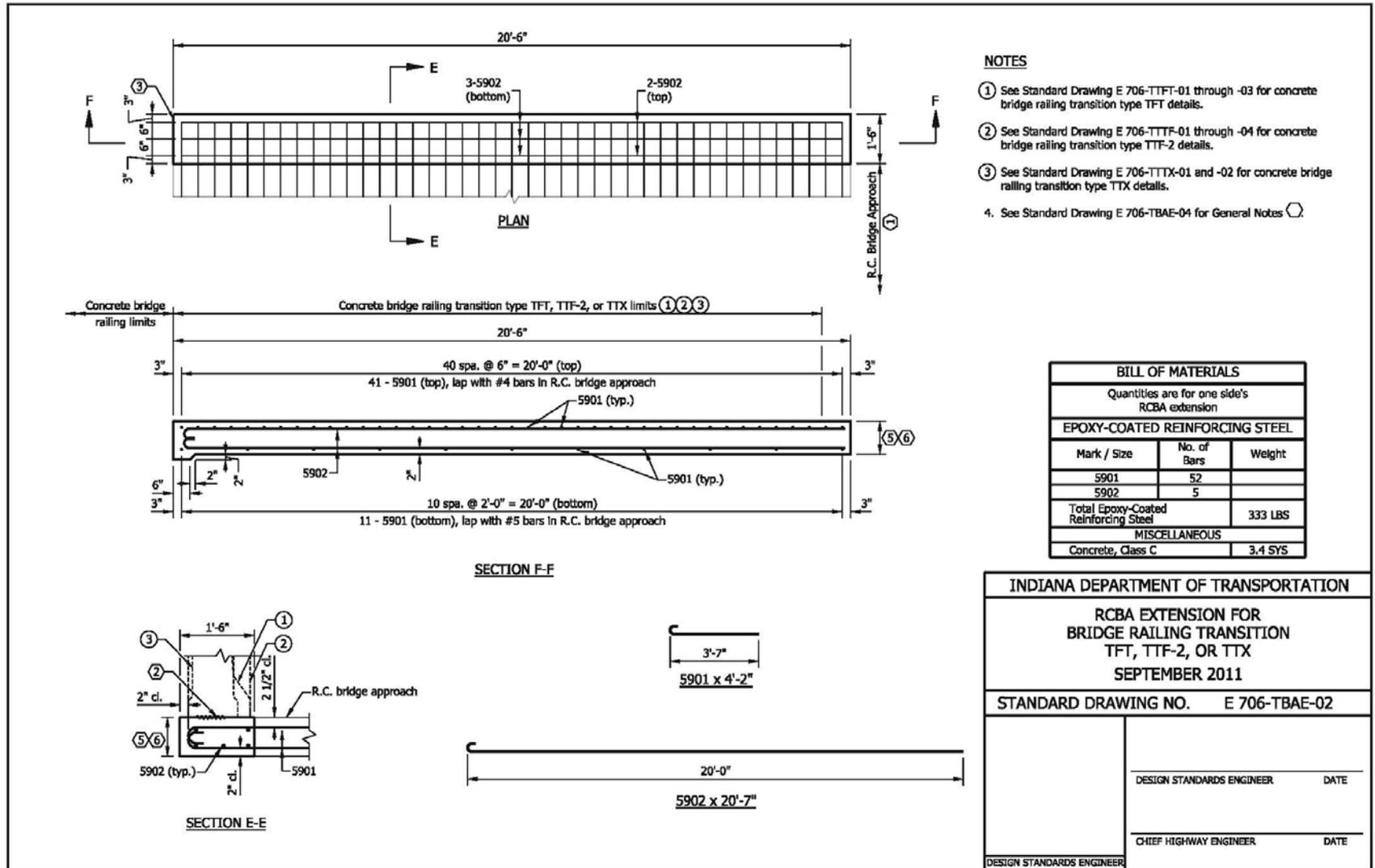
REVISION TO STANDARD DRAWINGS

706-TBAE-01 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION TFC, TPF-1, TPF-2, TPS-1, OR TPS-2 (DRAFT)



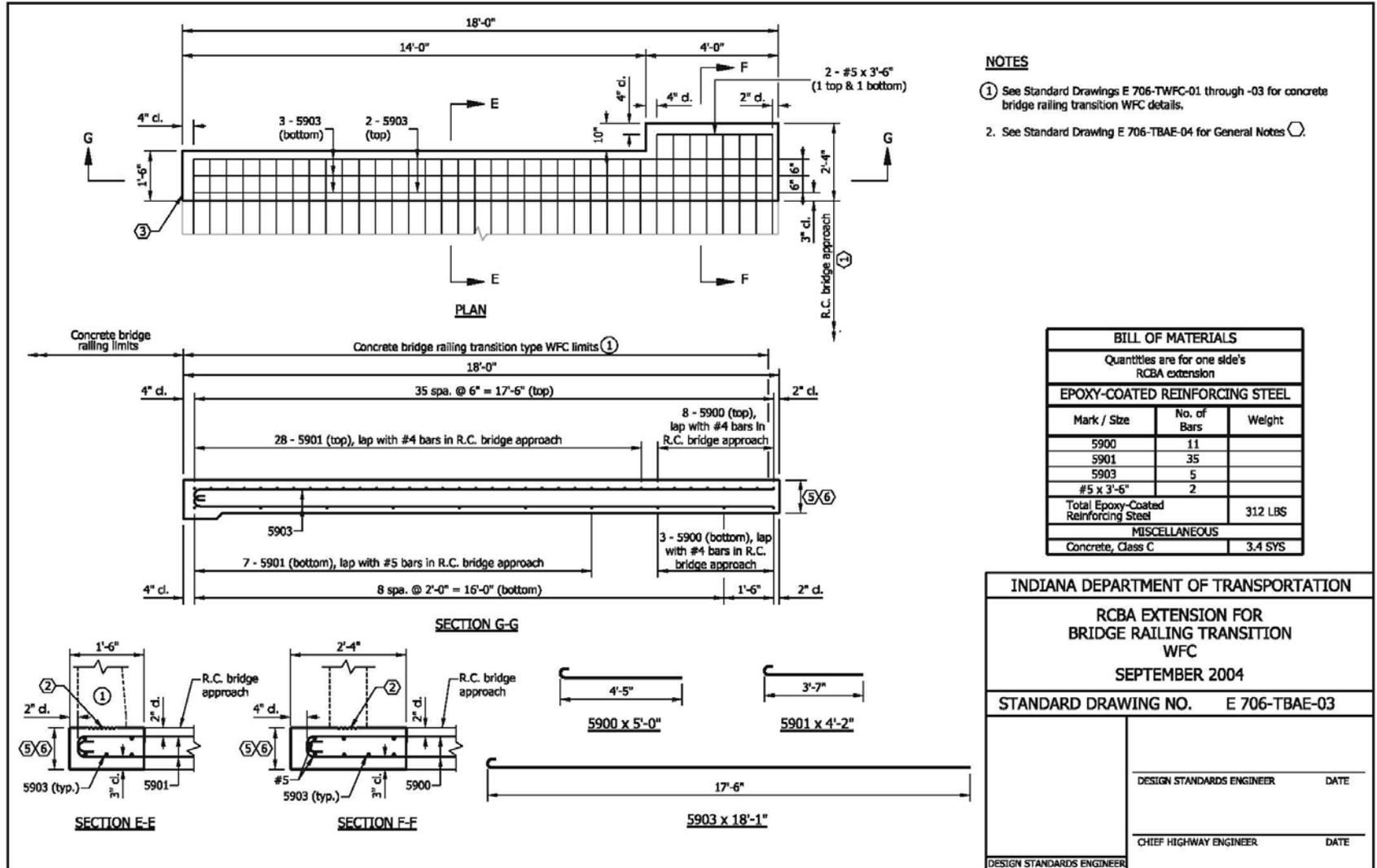
REVISION TO STANDARD DRAWINGS

706-TBAE-02 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION TFT, TTF-2, OR TTX (DRAFT)



REVISION TO STANDARD DRAWINGS

706-TBAE-03 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION WFC (DRAFT)



REVISION TO STANDARD DRAWINGS

706-TBAE-04 RCBA EXTENSION FOR BRIDGE RAILING TRANSITION GENERAL NOTES (DRAFT)

**GENERAL NOTES**

- ① See Standard Drawings E 609-RCBA-01 through -07 for reinforced concrete bridge approach details.
- ② Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.
- ③ This end of the reinforced concrete bridge approach extension shall match the construction at the bridge end as shown on the plans.
- 4. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.
- ⑤ See Standard Drawing E 609-RCBA-01 for thickness of RCBA and its extension to be used with asphalt pavement.
- ⑥ See Standard Drawing E 609-RCBA-02 for thickness of RCBA and its extension to be used with a terminal joint and portland cement concrete pavement.

<b>INDIANA DEPARTMENT OF TRANSPORTATION</b>	
<b>RCBA EXTENSION FOR BRIDGE RAILING TRANSITION GENERAL NOTES SEPTEMBER 2007</b>	
<b>STANDARD DRAWING NO. E 706-TBAE-04</b>	
	DESIGN STANDARDS ENGINEER _____ DATE _____
	CHIEF HIGHWAY ENGINEER _____ DATE _____
	DESIGN STANDARDS ENGINEER _____

COMMENTS AND ACTION

609.03 GENERAL REQUIREMENTS  
 704.02 MATERIALS  
 704.08 BASIS OF PAYMENT  
 706.04 CONCRETE RAILING WITH REINFORCED CONCRETE MOMENT SLAB  
 701-BPIL-01 - 06  
 702-CJTA-01  
 704-BDAF-01  
 704-SBFD-01  
 706-TASE-01 - 05  
 702-BCAW-01  
 703-BRST-01  
 704-BDCG-01 - 04  
 706-BRRW-01 - 10

<p>Motion:          Second:          Ayes:          Nays:</p>	<p>Action:  <input type="checkbox"/> Passed as Submitted  <input type="checkbox"/> Passed as Revised  <input type="checkbox"/> Withdrawn</p>
<p>Standard Specifications Sections affected:          609.03 pg 386; 704.02 pg 520; 704.08 pg 524; 706.04 pg 526 and 527          Recurring Special Provision affected:          NONE          Standard Sheets affected:          SEE PROPOSAL          Design Manual Sections affected:          NONE          GIFE Sections cross-references:          NONE</p>	<p><input type="checkbox"/> 20__ Standard Specifications Book  <input type="checkbox"/> Revise Pay Items List  <input type="checkbox"/> Create RSP (No.____)          Effective ____ Letting          RSP Sunset Date: ____  <input type="checkbox"/> Revise RSP (No.____)          Effective ____ Letting          RSP Sunset Date: ____          Standard Drawing Effective ____  <input type="checkbox"/> Create RPD (No. ____)          Effective ____ Letting  <input type="checkbox"/> Technical Advisory          GIFE Update Req'd.? Y __ N __          By ____ Addition or ____ Revision          Frequency Manual Update Req'd? Y __ N __          By ____ Addition or ____ Revision          Received FHWA Approval? ____</p>