



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N925
Indianapolis, Indiana 46204

PHONE: (317) 232-5502
FAX: (317) 234-5133

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

APPROVED MINUTES

February 16, 2012 Standards Committee Meeting
(The changes made to the Final Draft Minutes
are shown highlighted in yellow)

MEMORANDUM

March 22, 2012

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the February 16, 2012 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Miller at 09:03 a.m. on February 16, 2012 in the N955 Bay Window Conference Room. The meeting was adjourned at 11:20 a.m.

The following committee members were in attendance:

Mark Miller, Chairman	Ron Heustis, Major Prgm. Mgmt.
Bob Cales, Contr. Admin.	Greg Pankow, State Eng.
Mike Buening, Pvmt. Eng.	Jim Keefer, Fort Wayne Dist.
Randy Strain, Str. Services	Richard Vancleave, Roadway Services
Dave Boruff, Traffic Admin.	Michael Prather*, Materials Mgmt.

* Proxy for Ron Walker

Also in attendance were the following:

Tony Perkinson, FHWA	Tony Uremovich, INDOT
Scott Trammell, Secretary	Pete Capon, APAI- Rieth-Riley
Paul Berebitsky, ICA	Wendy Chiles, INDOT
Jim Reilman, INDOT	Steve Fisher, SiteManager
Lana Podorvanova, INDOT	

The following items were listed for consideration:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items were listed for consideration)

NEW BUSINESS

1. Approval of the Minutes from the January 19, 2012 Meeting

Motion: Mr. Miller
Second: Mr. Strain
Ayes: 8
Nays: 0

ACTION: APPROVED AS SUBMITTED

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items were listed for consideration)

NEW BUSINESS

(No items were listed for consideration)

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

OLD BUSINESS

<u>Item No. 03</u>	<u>01/19/12 (2012 SS)</u>	<u>Mr. Pankow</u>	<u>pg 05</u>
<u>Recurring Special Provision</u>			
704-X-XXX	PLACING REINFORCEMENT AND CONCRETE DECK POUR SEQUENCE		

ACTION: PASSED AS REVISED

<u>Item No. 08</u>	<u>01/19/12 (2012 SS)</u>	<u>Mr. Walker</u>	<u>pg 09</u>
<u>Recurring Special Provision</u>			
401-R-581	JOINT ADHESIVE AND INFORMATIONAL CORES		

ACTION: PASSED AS REVISED

<u>Item No. 09</u>	<u>01/19/12 (2012 SS)</u>	<u>Mr. Walker</u>	<u>pg 14</u>
401.04	Design Mix Formula		
401.05	Volumetric Mix Design		
401.08	Job Mix Formula		
401.09	Acceptance of Mixtures		
401.11	Preparation of Surfaces to be Overlaid		
401.16	Density		
401.20(d)	BSG of the Density Core		
401.22	Basis of Payment		
402.04	Design Mix Formula		
402.06	Job Mix Formula		
402.11	Preparation of Surfaces to be Overlaid		

402.16	Low Temperature Compaction Requirements
402.20	Basis of Payment
410.04	Design Mix Formula
410.08	Job Mix Formula
410.16	Density
410.20(c)	BSG of the Density Core
<i>SECTION 415</i>	<i>BASE SEAL</i>

ACTION: PASSED AS REVISED

NEW BUSINESS

<u>Item No. 01</u>	<u>02/16/12 (2012 SS)</u>	<u>Mr. Strain</u>	<u>pg 24</u>
706.03		Concrete Railing	
910.20		Steel Bridge Railing Components	

Standard Drawings:

706-BCBRBRSF-01	BRIDGE RAILING TYPE FC
706-BCBRBRSF-02	BRIDGE RAILING TYPE FT
706-BCBRBRSF-03	CONCRETE BRIDGE RAILING PLACEMENT
706-BCBR-04	CONCRETE BRIDGE RAILING
706-BRPP-01	RAILING, PF-1
706-BRPP-02	RAILING, PF-2
706-BRPP-03	RAILING, PS-1
706-BRPP-04	RAILING, PS-2
706-BRPP-05	RAILING, PF & AND PS RAIL SPLICE DETAILS
706-BRPP-06	RAILING, PF & PS DETAILS
706-BRTF-01	CONCRETE BRIDGE RAILING, TYPE TF-2
706-BRTF-02	CONCRETE BRIDGE RAILING, TYPE TF-2 RAIL SPLICE DETAILS
706-BRTF-03	CONCRETE BRIDGE RAILING, TYPE TF-2 MISCELLANEOUS DETAILS
706-BRTF-04	CONCRETE BRIDGE RAILING TYPE TF-2
706-BRTF-05	CONCRETE BRIDGE RAILING TYPE TF-2 DETAILS
706-BRTF-06	CONCRETE BRIDGE RAILING TYPE TF-2
706-BRTF-07	CONCRETE BRIDGE RAILING TYPE TF-2
706-BRTF-08	CONCRETE BRIDGE RAILING TYPE TF-2 RAILING SPLICE DETAIL
706-BRTF-09	CONCRETE BRIDGE RAILING TYPE TF-2
706-BRTM-01	RAILING, CF-1
706-BRTM-02	RAILING, CF-1
706-BRTX-01	RAILING, TX (TYPICAL PANEL)
706-BRTX-02	RAILING, TX (SPAN PILASTER) WINDOW DETAILS
706-BRTX-03	RAILING, TX (WINDOW DETAILS) SPAN PILASTER
706-BRTX-04	RAILING, TX (PIER OR END BENT PILASTER)
706-TBRCBRTR-01	RETROFIT THRIE BEAM BRIDGE RAILING TR
706-TBRCBRTR-02	RETROFIT THRIE BEAM BRIDGE RAILING TR
706-TBRCBRTR-03	RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS
706-TBRCBRTR-04	RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS

(continued)

706- TBRCBRTR-05	RETROFIT THRIE BEAM GUARDRAIL TRANSITION TYPE TGR
706- TBRCBRTR-06	RETROFIT THRIE BEAM GUARDRAIL HEIGHT TRANSITION
706-TBRE-01	RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS
706- TBRF-01	RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS
706- TBRF-02	RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS

Indiana Design Manual
Figure ~~61-6B404-4B~~

BRIDGE-RAILING TYPES

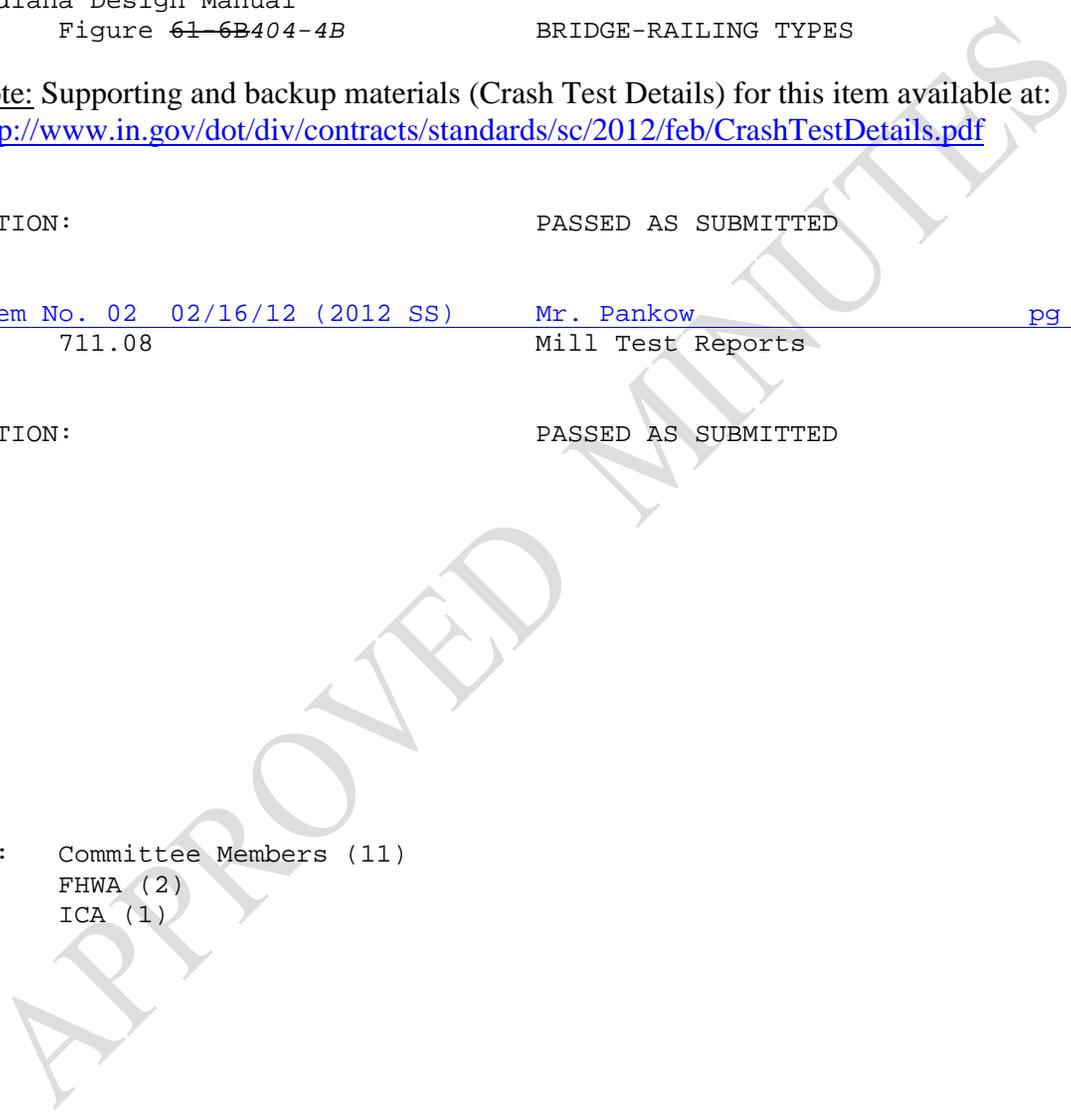
Note: Supporting and backup materials (Crash Test Details) for this item available at:
<http://www.in.gov/dot/div/contracts/standards/sc/2012/feb/CrashTestDetails.pdf>

ACTION: PASSED AS SUBMITTED

<u>Item No. 02 02/16/12 (2012 SS)</u>	<u>Mr. Pankow</u>	<u>pg 92</u>
711.08	Mill Test Reports	

ACTION: PASSED AS SUBMITTED

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



SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS (OLD BUSINESS)
REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: There is confusion regarding finishing machine minimum rate of progress for bridge deck pours.

PROPOSED SOLUTION: Adjust language in the 704 section to better explain the deck pour requirements.

APPLICABLE STANDARD SPECIFICATIONS: 704.04

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: 404-2.06(02)2a

APPLICABLE SECTION OF GIFE: 5.16

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 704 recurring special provision

PAY ITEMS AFFECTED: None

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT

Phone Number: 2-5502

Date: January 26, 2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc group consisting of: Greg Pankow, Jim Reilman, and Randy Strain.

(This RSP was titled "PLACING REINFORCEMENT AND CONCRETE"
on Agenda for January 19, 2012 meeting, item 03)

704-X-XXX DECK POUR SEQUENCE

(Adopted XX-XX-12)

The Standard Specifications are revised as follows:

SECTION 704, BEGIN LINE 32, DELETE AND INSERT AS FOLLOWS:

704.04 Placing Reinforcement and Concrete

Applicable provisions of 703 shall apply to placing reinforcing bars. No concrete shall be placed until the reinforcement is entirely and securely in place and has been inspected and approved. Walkways shall be in accordance with 702.20(a). Placing of reinforcement during placing of concrete will not be permitted without prior written approval. Splices, when permitted, shall be at locations of least tension in the steel.

The concrete deck pour sequence and procedure shall be submitted *for approval a minimum of 14 days prior to the planned deck pour for approval*. ~~The minimum pour rate is that which permits the finishing machine to progress at a rate of at least 25 ft/h (7.6 m/h). If this rate is not achieved, placement of transverse construction joints may be directed. The addition of construction joints shall be performed with no additional payment. Placement of concrete, when once started, shall be continuous between joints. Horizontal joints will not be permitted.~~ *The submittal shall include the following information:*

- (a) *the contract number;*
- (b) *the Contractor's name;*
- (c) *the bridge file number;*
- (d) ~~a statement indicating whether the pour sequence shown on the plans is being followed, or the Contractor's proposed pour sequence, whichever is applicable;~~
- (e) *the Contractor's proposed pour rate;*
- (f) *the approved concrete mix design; and*
- (g) *the driving delivery time from the concrete batching location to the jobsite.*

If, during the pour, the approved pour rate is not achieved, placement of transverse construction joints may be directed as shown on the plans. Placement of concrete shall be continuous between joints. Horizontal joints will not be permitted.

Floor drains shall be placed in gutters at locations shown on the plans and fastened securely before placing the surrounding concrete. The tops of the floor drains shall be no more than 1/2 in. ~~(13 mm)~~ below the adjacent gutter grade. The drains shall be constructed so drainage water is not discharged against portions of the structure.

Expansion joints shall be constructed as shown on the plans and the material shall be in accordance with 906.01.

~~Transverse construction joints as shown on the plans for the floor slab of prestressed concrete beam structures may be eliminated by written approval under the condition as follows:~~

- ~~(a) A retarding or a water reducing retarding admixture shall be used in the concrete to delay set as required and approved.~~
- ~~(b) Concrete shall be placed for the full width of the structure, unless otherwise approved.~~
- ~~(c) It is determined that the concrete on 2 adjacent spans can be placed within a period of time which is less than the time for the initial set of the concrete section over the pier common to the 2 spans.~~

APPROVED MINUTES

COMMENTS AND ACTION

(OLD BUSINESS)

704-X-XXX DECK POUR SEQUENCE

DISCUSSION: This item was introduced by Mr. Pankow and further explained by Mr. Reilman. Mr. Reilman explained the proposed revisions as presented. Mr. Pankow further explained the Contractor's responsibilities, reinforcing the editorial revisions contained herein.

Mr. Reilman also described how the application rates may vary depending on the project and the project conditions.

Mr. Heustis recommended that the designer put their assumptions on the plans in regards to how the deck is to be poured, involving the pour sequence and application rates.

Mr. Reilman mentioned that the Contractor still needs to provide their intended pour rates and sequence plan as well. Further discussion ensued between Mr. Reilman, Mr. Strain, and Mr. Heustis regarding pour sequencing, application rates, and Contractor intentions depending on the type of deck beams involved.

Mr. Miller mentioned that we can show the pour sequence and the Contractor can determine the rate and would therefore have something to bid on. Mr. Keefer suggested a minor editorial revision, involving *for approval*, which was approved by the group. Further edits were also made with respect to the Contractor's submittal requirements, items *d* and *e*. Design Manual changes will be made by Mr. Reilman and Mr. Strain.

Motion: Mr. Pankow Second: Mr. Cales Ayes: 9 Nays: 0	Action: <input type="checkbox"/> Passed as Submitted <input checked="" type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
Standard Specifications Sections affected:	<input checked="" type="checkbox"/> 2014 Standard Specifications Book <input type="checkbox"/> Revise Pay Items List
704.04 pg 520 and 521.	<input checked="" type="checkbox"/> Create RSP (No. 704-B-196) Effective Sept. 01, 2012 Letting RSP Sunset Date: Sept. 01, 2013
Recurring Special Provision affected:	<input type="checkbox"/> Revise RSP (No. ____) Effective ____ Letting RSP Sunset Date: ____
NONE	Standard Drawing Effective ____
Standard Sheets affected:	<input type="checkbox"/> Create RPD (No. ____) Effective ____ Letting
NONE	<input checked="" type="checkbox"/> Technical Advisory
Design Manual Sections affected:	GIFE Update Req'd.? Y __ N __
404-2.06(02)2a	By ____ Addition or ____ Revision
GIFE Sections cross-references:	Frequency Manual Update Req'd? Y __ N __
Section 5.7.2 and 5.16	By ____ Addition or ____ Revision
	Received FHWA Approval? <u>YES</u>

SPECIFICATIONS, SPECIAL PROVISION AND STANDARD DRAWINGS (OLD BUSINESS)
REVISION TO SPECIAL PROVISION

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The Joint Adhesive Unique Special Provision has successfully been placed on several contracts in 2011 and to obtain information on the cost of this application a Recurring Special Provision should be developed and placed in several contracts in 2012. Additionally a provision to require a fog seal after the application of the joint adhesive should be added to Recurring Special Provision to further seal the joint.

PROPOSED SOLUTION: Make the Unique Special Provision for Joint Adhesive and Informational Cores into a Recurring Special Provision and revise the specifications as follows:

1. Move the joint adhesive description, testing, and acceptance requirements into section 906. There is more than one product available for this application that can meet the acceptance requirements.
2. Add a fog seal requirement to be applied after all density cores have been taken and the milled centerline corrugations, when specified, have been completed.
3. Add additional information on the application of the temporary pavement markings.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION:

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS: 401-R-581

Submitted By: Ron Walker
Title: Manager, Office of Materials Management
Organization: INDOT
Phone Number: 317-610-7251 x 204
Date: 1-6-12

APPLICABLE SUB-COMMITTEE ENDORSEMENT? These specification revisions are recommended by INDOT/APAI Technical Committee.

REVISION TO SPECIAL PROVISION (OLD BUSINESS)
 401-R-581 JOINT ADHESIVE ~~AND INFORMATIONAL~~ CORES

(This provision (2010 SS) was approved on 09/16/10 Standards Committee Meeting and used on selected projects as the Unique Special Provision.)

401-R-581 JOINT ADHESIVE ~~AND INFORMATIONAL~~ CORES

(Revised XX-XX-12)

The Standard Specifications are revised as follows:

SECTION 401, AFTER LINE 8, INSERT AS FOLLOWS:

~~Joint adhesive is a hot applied asphalt material that is used to seal the construction joint formed between the adjacent HMA pavement courses.~~

SECTION 401, AFTER LINE 31, DELETE AND INSERT AS FOLLOWS:

~~Joint adhesive shall meet the following material requirements.~~

Test	Method	Test Results
Softening Point, °F (°C)	AASHTO T 51	170 (77) minimum
Ductility @ 77 °F (25 °C) (5 cm/min)	AASHTO T 51	> 30
Ductility @ 39 °F (4 °C) (5 cm/min)	AASHTO T 51	> 30
Apparent Viscosity, cp, @ 400 °F (230 °C)	ASTM D 2669	4,000—10,000
Asphalt Compatibility	AASHTO M 301	Pass
Cone Penetration, mm	AASHTO M 301	60.0—100.0
Flow, mm	AASHTO M 301	< 5
Resilience @ 77 °F (25 °C), %	AASHTO M 301	> 30
Tensile Adhesion @ 77 °F (25 °C)	AASHTO M 301	> 500
Flexibility @ 0 °F (-18 °C)	ASTM D 3111	Pass
Flash Point, °F (°C)	AASHTO T 48	> 410 (210)

~~The adhesive will be accepted by type A certification in accordance with 916 for each batch or lot of material furnished.~~

SECTION 401, AFTER LINE 342 335, INSERT AS FOLLOWS:

Hot poured joint adhesive in accordance with 906 shall be applied to longitudinal joints constructed **between 2 adjacent HMA courses** in the top course of dense graded intermediate mixtures and all surface mixture courses. This includes joints within the traveled way as well as between any of the following: traveled way and an auxiliary lane, traveled way and a paved shoulder, and auxiliary lane and a paved shoulder.

The material shall be heated in a jacketed, double boiler melting kettle. The kettle shall have an attached pressure feed wand system with applicator shoe.

The joint adhesive shall be applied to the face of the previously constructed edge at the joint using a wand applicator. Prior to application of the joint adhesive, the joint face shall be dry and free of loose material and foreign objects. The adhesive shall be

applied on the joint face 1/8 in. (~~3 mm~~) thick at the temperature recommended by the manufacturer. Excess joint adhesive shall not be allowed to pool on the top of the previously constructed pavement course or the pavement to be overlaid. The application of the adhesive shall be made within the same day, but at least 15 min prior to construction of the longitudinal joint.

All surface mixture longitudinal joints that have the joint adhesive applied shall be ~~fog~~ sealed using AE-F asphalt emulsion in accordance with 902.01(b). The ~~fog~~ sealing operation shall not begin until all density cores in accordance with 401.16 and 401.20 have been obtained and the installation of milled centerline corrugations, when specified, has been completed.

The ~~fog seal~~liquid asphalt sealant, AE-F, shall be ~~applied on the joint line~~ a minimum width of 24 in. ~~and a maximum width of 28 in.~~, centered on the joint line, and ~~may~~ shall be extended, when necessary, to provide coverage beyond the edge of the corrugation. ~~The fog seal~~AE-F shall be applied at an application rate of 0.06 ± 0.02 gal./sq yd onto a dry surface, free of any foreign or loose material, using a distributor in accordance with 409.03(a). The ambient air ~~or~~ and pavement temperatures at the time of application shall be greater than 32°F. Temporary pavement markings in accordance with 801.12 shall be offset a sufficient distance from the longitudinal joint so as to not to obstruct the installation of the milled centerline corrugations or the application of the ~~fog~~ liquid asphalt sealant. The ~~fog seal~~AE-F shall be cured a minimum of 5 days prior to applying the permanent pavement traffic markings in accordance with 808.

~~SECTION 401, BEGIN LINE 362, DELETE AS FOLLOWS:~~

~~*Density acceptance by cores will be based on samples obtained from 2 random locations selected by the Engineer within each subplot in accordance with ITM 802. One core shall be cut at each random location in accordance with ITM 580. The transverse core location will be located so that the edge of the core will be no closer than 12 in. (300 mm) from the edge of the course being placed. The maximum specific gravity will be determined from the samples obtained in 401.09.*~~

~~*In addition, 2 informational cores shall be obtained at the same station as the density acceptance cores. The center of 1 core shall be located 6 in. (150 mm) from the left edge of the course being placed and the center of the other core shall be located 6 in. (150 mm) from the right edge of the course being placed. These informational cores will not be used in the density pay factor determination.*~~

~~SECTION 401, AFTER LINE 667745, INSERT AS FOLLOWS:~~

~~*Joint adhesive will be measured by the linear foot in accordance with 109.01(a).
Fog seal will be measured by the square yard complete in place.*~~

~~SECTION 401, AFTER LINE 681759, INSERT AS FOLLOWS:~~

~~*Joint adhesive will be paid for by the linear foot, complete in place.
Fog seal will be paid for at the contract unit price per square yard.*~~

COMMENTS AND ACTION

(OLD BUSINESS)

401-R-581 JOINT ADHESIVE AND INFORMATIONAL CORES

DISCUSSION: This item was introduced and presented by Mr. Prather, who explained the edits incorporated into the previously approved provision.

Mr. Heustis clarified that the intention is to fog seal all joints which receive the joint adhesive, and not just if it has corrugations.

Mr. Keefer inquired about the temperature requirements. Does the temperature requirement apply to both the surface temp and the air temp?

It was agreed to change the *or* to *and*, as shown. Further edits were discussed by the committee and incorporated as shown. It was also determined that the costs associated with fog sealing the joint shall be included with the cost for the joint adhesive.

The motion for approval was revised by Mr. Prather.

Motion: Mr. Prather Second: Mr. Cales Ayes: 9 Nays: 0	Action: <input type="checkbox"/> Passed as Submitted <input checked="" type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
Standard Specifications Sections affected: 401.14 pg 241; 401.21 pg 252; 401.22 pg 253.	<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: _____
Recurring Special Provision affected: 401-R-581 JOINT ADHESIVE AND INFORMATIONAL CORES	<input checked="" type="checkbox"/> Revise RSP (No. <u>401-R-581</u>) Effective <u>Sept. 01, 2012</u> Letting RSP Sunset Date: _____
Standard Sheets affected: NONE	Standard Drawing Effective _____ <input type="checkbox"/> Create RPD (No. _____) Effective _____ Letting
Design Manual Sections affected: NONE	<input type="checkbox"/> Technical Advisory GIFE Update Req'd.? Y ___ N ___ By _____ Addition or _____ Revision
GIFE Sections cross-references: NONE	Frequency Manual Update Req'd? Y ___ N ___ By _____ Addition or _____ Revision Received FHWA Approval? <u>YES</u>

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS (OLD BUSINESS)
REVISION TO SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The following HMA items require revisions to sections 401, 402, 410, and 415:

1. Preparation of Surfaces to be Overlaid (401.11) -- Additional requirements for maintaining the pavement course or subgrade during construction is needed to include proofrolling a previously constructed course prior to placing a subsequent course. Pavement or subgrade that yields as a result of the proofroll shall be removed and replaced prior to placement of any subsequent course. The cost of this work shall be included in the cost of the other pay items. This requirement is currently in 402.12.
2. Base Seal (401.11, 402.11) -- HMA mixtures placed below open graded mixtures should be sealed to prevent the penetration of moisture into the subgrade. This requirement would not be needed on the base in a full depth section without open-graded mixture because there is no means for the moisture to be removed from the pavement and an accumulation of moisture within the full depth section could be damaging. Time limitations are required to allow density cores to be taken to assure that the base mixture is not exposed to moisture for any significant amount of time. A separate section (415) is required to designate the materials allowed for this application, the construction requirements, and basis of payment of the base seal.
3. Design Mix Formula (401.04, 402.4, 410.04) and DMF/JMF (401.08,402.04, 410.08) -- A maximum temperature of HMA is needed to prevent pavement cracking which has occurred when mixtures are produced at excessively high temperatures. Depending on the PG asphalt used, a maximum plant discharge temperature is required. Also, restrictions on the use of the water-injection foaming device should be removed because of the success we have had with this process.
4. Bulk Specific Gravity of HMA Specimens (401.05, 401.16, 401.20 (b), 402.16, 410.15, and 410.20 (c)) -- AASHTO T 166, Bulk Specific Gravity of Compacted HMA Using SSD Specimens, has been revised to allow T 275 (Paraffin-Coated method) or T 331 (Vacuum Sealing method) to be used when the sample contains open or interconnecting voids or absorbs more than 2.0 % of water by volume. We have conducted a study that indicates there is a significant difference between test values of these two test procedures on the same samples and designating only T 275 as the test method to be used is required. AASHTO will revise T 166 in 2013 based on our study and studies by other states.

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS (OLD BUSINESS)
REVISION TO SPECIFICATIONS

5. Volumetric Mix Design (401.05) -- Recycled materials, to include RAP and RAS, should be allowed in open-graded mixtures to promote the greater use of these materials. Additional requirements for the binder type when fibers or reclaimed asphalt shingles are used are required.
6. Job Mix Formula (402.06) -- Requirements for changes in the source and grade of the binder when 0 -15 % RAP is used in the mixture should be deleted because this requirement has been replaced by the binder replacement specification in 402.

PROPOSED SOLUTION: The following revisions are recommended:

1. Add proofrolling requirements for maintaining a pavement course or subgrade during construction
2. Require the base mixture placed below open graded mixtures to be sealed
3. Add a maximum plant discharge temperature requirement for HMA
4. Require AASHTO T 275 when specimens contain open or interconnecting voids or absorb more than 2.0 % of water by volume.
5. Allow RAP and RAS in open graded mixtures

APPLICABLE STANDARD SPECIFICATIONS: 401.04, 401.05, 401.08, 401.11, 401.13, 401.16, 401.20(b), 401.21, 402.04, 402.06, 402.11, 402.16, 410.04, 410.08, 410.15, and 410.20(c)

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION:

APPLICABLE SECTION OF GIFE: Section 13

APPLICABLE RECURRING SPECIAL PROVISIONS:

Submitted By: Ron Walker
Title: Manager, Office of Materials Management
Organization: INDOT
Phone Number: 317-610-7251 x 204
Date: 1-30-12

APPLICABLE SUB-COMMITTEE ENDORSEMENT? These specification revisions are recommended by the INDOT/APAI Technical Committee.

REVISION TO SPECIFICATIONS

(OLD BUSINESS)

SECTION 401 - QUALITY CONTROL/QUALITY ASSURANCE, QC/QA, HOT MIX
ASPHALT, HMA, PAVEMENT
401.04 DESIGN MIX FORMULA
401.05 VOLUMETRIC MIX DESIGN
401.08 JOB MIX FORMULA
401.09 ACCEPTANCE OF MIXTURES
401.11 PREPARATION OF SURFACES TO BE OVERLAID
401.16 DENSITY
401.20(d) BSG OF THE DENSITY CORE
401.22 BASIS OF PAYMENT

The Standard Specifications are revised as follows:

SECTION 401, BEGIN LINE 48, DELETE AND INSERT AS FOLLOWS:

The plant discharge temperature for any mixture shall not be more than 315°F whenever PG 58-28, PG 64-22, PG 64-28 or PG 70-22 binders are used or 325°F whenever PG 70-28 or PG 76-22 binders are used. QC/QA HMA may be produced as warm mix asphalt, WMA, by using a water-injection foaming device for ESAL category 1, 2 and 3 mixtures. The DMF shall list the minimum and maximum plant discharge temperatures for HMA and WMA as applicable to the mixture.

SECTION 401, BEGIN LINE 79, INSERT AS FOLLOWS:

determined in water in accordance with AASHTO T 209. The bulk specific gravity of the gyratory specimens shall be determined in accordance with AASHTO T 166, Method A or AASHTO T 275, if required, for dense graded mixtures and AASHTO T 331 for open graded mixtures.

The percent draindown of open graded mixtures shall not exceed 0.30% in accordance with AASHTO T 305. Open graded mixtures may incorporate *recycled materials and fibers. The recycled materials shall be in accordance with 401.06, and the fiber type and minimum dosage rate shall be in accordance with AASHTO M 325.* The binder for open graded mixtures containing fibers may be reduced by 1 temperature classification, 6°C, for the upper temperature classification. *The fiber type and minimum dosage rate shall be in accordance with AASHTO M 325 have the upper temperature classification reduced by 6°C from the specified binder grade if fibers are incorporated into the mixture or if a minimum of 3.0% reclaimed asphalt shingles by weight of the total mixture are used.*

SECTION 401, BEGIN LINE 190, DELETE AND INSERT AS FOLLOWS:

A job mix formula, JMF, shall be developed by a certified HMA producer. A JMF used in the current or previous calendar year that was developed to N_{des} will be allowed. The mixture compaction temperature shall be $300 \pm 9^{\circ}\text{F}$ ($150 \pm 5^{\circ}\text{C}$) for dense graded mixtures and $260 \pm 9^{\circ}\text{F}$ ($125 \pm 5^{\circ}\text{C}$) for open graded mixtures. The JMF shall list the minimum and maximum plant discharge temperatures for HMA and WMA as applicable to the mixture. The JMF for each mixture shall be submitted to the Engineer and shall use the same MAF as the DMF.

SECTION 401, BEGIN LINE 222, INSERT AS FOLLOWS:

REVISION TO SPECIFICATIONS

(OLD BUSINESS)

SECTION 401 - QUALITY CONTROL/QUALITY ASSURANCE, QC/QA, HOT MIX
ASPHALT, HMA, PAVEMENT
401.04 DESIGN MIX FORMULA
401.05 VOLUMETRIC MIX DESIGN
401.08 JOB MIX FORMULA
401.09 ACCEPTANCE OF MIXTURES
401.11 PREPARATION OF SURFACES TO BE OVERLAID
401.16 DENSITY
401.20(d) BSG OF THE DENSITY CORE
401.22 BASIS OF PAYMENT

The bulk specific gravity of gyratory specimens for dense graded mixtures will be determined in accordance with AASHTO T 166, Method A *or* AASHTO T 275, *if required*, except samples are not required to be dried overnight. The bulk specific gravity of gyratory specimens for open graded mixtures, OG19.0, OG25.0 will be determined in accordance with AASHTO T 331.

SECTION 401, AFTER LINE 310, INSERT AS FOLLOWS:

Prior to placing an open graded mixture, the underlying HMA course shall have a full width base seal applied in accordance with 415. The base seal materials shall be applied within 3 calendar days after all density cores in accordance with 401.16 have been obtained.

SECTION 401, AFTER LINE 315, INSERT AS FOLLOWS:

All partially completed sections of roadway that are 8 in. or less in thickness shall be proofrolled prior to the placement of additional materials ~~the following spring~~ unless otherwise directed by the Engineer. Proofrolling shall be accomplished in accordance with 203.26. The contact pressure shall be 70 to 80 psi. Soft yielding areas shall be removed and replaced.

SECTION 401, BEGIN LINE 423, INSERT AS FOLLOWS:

The Engineer will determine the bulk specific gravity of the cores in accordance with AASHTO T 166, Method A *or* AASHTO T 275, *if required*. The maximum specific gravity will be mass determined in water in accordance with AASHTO T 209.

SECTION 401, BEGIN LINE 728, INSERT AS FOLLOWS:

(d) BSG of the Density Core

Additional cores shall be taken within 7 calendar days unless otherwise directed. Additional core locations will be determined by adding 1 ft ~~(0.3 m)~~ longitudinally of the cores tested using the same transverse offset. The appeal density cores will be dried in accordance with ITM 572 and tested in accordance with AASHTO T 166, Method A *or* AASHTO T 275, *if required*.

SECTION 401, AFTER LINE 779, INSERT AS FOLLOWS:

The cost of removing and replacing soft and yielding areas ~~discovered by proofrolling~~ shall be included in the cost of other pay items in this section.

REVISION TO SPECIFICATIONS

(OLD BUSINESS)

SECTION 402 - HOT MIX ASPHALT, HMA, PAVEMENT
402.04 DESIGN MIX FORMULA
402.06 JOB MIX FORMULA
402.11 PREPARATION OF SURFACES TO BE OVERLAID
402.16 LOW TEMPERATURE COMPACTION REQUIREMENTS
402.20 BASIS OF PAYMENT

The Standard Specifications are revised as follows:

SECTION 402, BEGIN LINE 39, DELETE AND INSERT AS FOLLOWS:

*The plant discharge temperature for any mixture shall not be more than 315°F whenever PG 58-28, PG 64-22, PG 64-28 or PG 70-22 binders are used or 325°F whenever PG 70-28 or PG 76-22 binders are used. HMA may be produced as ~~warm mix asphalt, WMA,~~ by using a water-injection foaming device. ~~for temporary HMA mixtures and type A, B and C mixtures.~~ The DMF shall list the minimum *and maximum* plant discharge temperatures ~~for HMA and WMA~~ as applicable to the mixture.*

SECTION 402, BEGIN LINE 74, DELETE AS FOLLOWS:

~~For mixtures containing 0.0% to 15.0% RAP, changes in the source and grade of specified binders will be permitted; however, the high temperature grade shall meet the minimum requirements of 402.04.~~

SECTION 402, BEGIN LINE 204, INSERT AS FOLLOWS:

Prior to placing an open graded mixture, the underlying HMA course shall have a full width base seal applied in accordance with 415. The base seal materials shall be applied within 3 calendar days upon completion of paving the underlying HMA course.

SECTION 402, BEGIN LINE 220, DELETE AND INSERT AS FOLLOWS:

All partially completed sections of roadway that are 8 in. (200 mm) or less in thickness shall be proofrolled prior to the placement of additional materials ~~the following spring unless otherwise directed by the Engineer.~~ Proofrolling shall be accomplished in accordance with 203.26. The contact pressure shall be 70 to 80 psi (480 to 550 kPa). Soft yielding areas shall be removed and replaced.

SECTION 402, BEGIN LINE 380, INSERT AS FOLLOWS:

The Engineer will determine the bulk specific gravity of the cores in accordance with AASHTO T 166, Method A *or AASHTO T 275, if required.* The maximum specific gravity will be mass determined in water in accordance with AASHTO T 209. Density shall not be less than 92.0%.

SECTION 402, BEGIN LINE 431, DELETE AS FOLLOWS:

The cost of removing and replacing soft yielding areas ~~discovered by proofrolling~~ shall be included in the cost of other pay items in this section.

REVISION TO SPECIFICATIONS

(OLD BUSINESS)

SECTION 410 - QUALITY CONTROL/QUALITY ASSURANCE, QC/QA, HMA SURFACE -
SMA PAVEMENT

- 410.04 DESIGN MIX FORMULA
- 410.08 JOB MIX FORMULA
- 410.16 DENSITY
- 410.20(c) BSG OF THE DENSITY CORE

The Standard Specifications are revised as follows:

SECTION 410, AFTER LINE 43, INSERT AS FOLLOWS:

The plant discharge temperature for any mixture shall not be more than 315°F whenever PG 58-28, PG 64-22, PG 64-28, or PG 70-22 binders are used or 325°F whenever PG 70-28 or PG 76-22 binders are used. SMA may be produced using a water-injection foaming device. The DMF shall list the minimum and maximum plant discharge temperatures as applicable to the mixture.

SECTION 410, BEGIN LINE 153, INSERT AS FOLLOWS:

410.08 Job Mix Formula

A job mix formula, JMF, shall be developed by a certified HMA producer in accordance with ITM 583. A JMF used for SMA mixture the current or previous calendar year will be allowed. The mixture compaction temperature shall be $300 \pm 9^{\circ}\text{F}$ ($150 \pm 5^{\circ}\text{C}$). *The JMF shall list the minimum and maximum plant discharge temperatures as applicable to the mixture.* The JMF for each mixture shall be submitted to the Engineer.

SECTION 410, BEGIN LINE 344, DELETE AND INSERT AS FOLLOWS:

The Engineer will determine the ~~BSG~~ *bulk specific gravity* of the cores in accordance with AASHTO T 166, Method A *or AASHTO T 275, if required.* The target value for density of SMA mixtures of each subplot shall be 93.0%.

~~The Engineer will determine the bulk specific gravity of the cores in accordance with AASHTO T 166, Method A. The maximum specific gravity will be mass determined in water in accordance with AASHTO T 209. Density shall not be less than 92.0%.~~

SECTION 410, BEGIN LINE 465, INSERT AS FOLLOWS:

(c) BSG of the Density Core

Cores shall be taken within 7 calendar days unless otherwise directed. Additional core locations will be determined by adding 1 ft (~~0.3m~~) longitudinally of the cores tested using the same transverse offset. The cores will be dried in accordance with ITM 572 and tested in accordance with AASHTO T 166, Method A *or AASHTO T 275, if required.* The Contractor shall clean, dry, and refill the core holes with SMA or HMA surface materials within 1 work day of the coring operations.

The Standard Specifications are revised as follows:

SECTION 415, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 415 - BASE SEAL

415.01 Description

This work shall consist of applying asphalt emulsion to the pavement surface in accordance with 105.03.

MATERIALS

415.02 Materials

Base seal materials shall be in accordance with the following:

Asphalt Emulsion, SS-1h, AE-NT.....902.01(b)

CONSTRUCTION REQUIREMENTS

415.03 Equipment

A distributor in accordance with 409.03(a) shall be used.

415.04 Weather Limitations

Base sealing operations shall not be conducted on a wet pavement or when the ambient air or pavement temperature is below 32°F.

415.05 Preparation of Surface

Surfaces shall be clean and free of any foreign or loose material.

415.06 Application of Asphalt Material

The base seal materials shall be applied to the pavement surface uniformly with a distributor at an application rate of 0.22 ± 0.02 gal./sq yd.

415.07 Protection of Surface

The base seal materials shall cure a minimum of 2 hours after application before resuming paving operations.

415.08 Method of Measurement

The base seal will be measured by the ton complete in place.

415.09 Basis of Payment

The base seal will be paid for at the contract unit price per ton.

Payment will be made under:

REVISION TO SPECIFICATIONS

(OLD BUSINESS)

PROPOSED NEW SECTION 415 - BASE SEAL

Pay Item

Pay Unit Symbol

Base Seal.....TON

The costs of all asphalt materials, surface preparation and all other necessary incidentals shall be included in the cost of the pay item.

APPROVED MINUTES

COMMENTS AND ACTION

(OLD BUSINESS)

401.04 DESIGN MIX FORMULA	402.11 PREPARATION OF SURFACES TO BE OVERLAID
401.05 VOLUMETRIC MIX DESIGN	
401.08 JOB MIX FORMULA	402.16 LOW TEMPERATURE COMPACTION REQUIREMENTS
401.09 ACCEPTANCE OF MIXTURES	
401.11 PREPARATION OF SURFACES TO BE OVERLAID	402.20 BASIS OF PAYMENT
401.16 DENSITY	410.04 DESIGN MIX FORMULA
401.20(d) BSG OF THE DENSITY CORE	410.08 JOB MIX FORMULA
401.22 BASIS OF PAYMENT	410.16 DENSITY
402.04 DESIGN MIX FORMULA	410.20(c) BSG OF THE DENSITY CORE
402.06 JOB MIX FORMULA	SECTION 415 - BASE SEAL

DISCUSSION: This item was introduced and presented by Mr. Prather, who was sitting in for Mr. Walker. Mr. Prather explained the proposed revisions which resulted from comments and discussions from the January 16, 2012 Standards Committee meeting. Mr. Prather addressed each item as illustrated in the proposal page. Mr. Miller inquired about the paraffin coating in regards to the vacuum sealing. Mr. Prather explained that we only use the vacuum coating with open graded mixtures.

Upon inquiry from Mr. Keefer, two items previously struck out in 402 have now been "un-struck", as shown, since those items had been intended to be moved to 105 last time, but now are being incorporated into the 401 and 402 revisions. Mr. Heustis recommended editorial changes regarding the reference to "spring", and those edits have been incorporated as shown in these minutes. Also, the phrase "discovered by proofrolling" has been removed.

Mr. Heustis recommended including the Base Seal into 401 rather than creating a new section in the spec book. Mr. Prather suggested incorporating into 401.11 for the 2014 book. Mr. Cales prefers to see everything incorporated into one 400 RSP for inclusion into contracts, instead of multiple items. Mr. Prather further clarified that this is much different than a tack coat. Base Seal section 415 will be incorporated into the existing 400 RSP.

Mr. Prather made the motion that the items be accepted as revised.

COMMENTS AND ACTION

(OLD BUSINESS)

401.04 DESIGN MIX FORMULA	402.11 PREPARATION OF SURFACES TO BE OVERLAID
401.05 VOLUMETRIC MIX DESIGN	402.16 LOW TEMPERATURE COMPACTION REQUIREMENTS
401.08 JOB MIX FORMULA	402.20 BASIS OF PAYMENT
401.09 ACCEPTANCE OF MIXTURES	410.04 DESIGN MIX FORMULA
401.11 PREPARATION OF SURFACES TO BE OVERLAID	410.08 JOB MIX FORMULA
401.16 DENSITY	410.16 DENSITY
401.20(d) BSG OF THE DENSITY CORE	410.20(c) BSG OF THE DENSITY CORE
401.22 BASIS OF PAYMENT	SECTION 415 - BASE SEAL
402.04 DESIGN MIX FORMULA	
402.06 JOB MIX FORMULA	

(CONTINUED)

<p>Motion: Mr. Prather Second: Mr. Cales Ayes: 9 Nays: 0</p>	<p>Action: <input type="checkbox"/> Passed as Submitted <input checked="" type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn</p>
<p>Standard Specifications Sections affected: 401.04 pg 233, 234; 401.08 pg 238; 401.09 pg 238, 239; 401.11 pg 240; 401.16 pg 243; 401.20 pg 252; 402.03 pg 255; 402.06 pg 256; 402.11 pg 259; 402.12 pg 259; 402.16 pg 263; 402.20 pg 264; 410.04 pg 281; 410.08 pg 284; 410.16 pg 289.</p> <p>Recurring Special Provision affected: 400-R-553 HMA PROVISIONS</p> <p>Standard Sheets affected: NONE</p> <p>Design Manual Sections affected: NONE</p> <p>GIFE Sections cross-references: SECTION 13</p>	<p><input checked="" type="checkbox"/> 2014 Standard Specifications Book <input checked="" type="checkbox"/> Revise Pay Items List</p> <p><input type="checkbox"/> Create RSP (No. ____) Effective ____ Letting RSP Sunset Date: ____</p> <p><input checked="" type="checkbox"/> Revise RSP (No. <u>400-R-583</u>) Effective <u>Sept. 01, 2012</u> Letting RSP Sunset Date: <u>TBD</u></p> <p>Standard Drawing Effective ____ <input type="checkbox"/> Create RPD (No. ____) Effective ____ Letting <input type="checkbox"/> Technical Advisory</p> <p>GIFE Update Req'd.? Y __ N __ By ____ Addition or ____ Revision</p> <p>Frequency Manual Update Req'd? Y__N__ By ____ Addition or ____ Revision</p> <p>Received FHWA Approval? <u>YES</u></p>

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS
REVISION TO STANDARD SPECIFICATIONS, STANDARD DRAWINGS AND DESIGN MANUAL

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: In reviewing the bridge rail design materials covered in the Indiana Design Manual chapter 404, figure 404-4B incorrectly identifies the CF-1 rail as a TL-4, The height of the rail was given as 2'-11" instead of the value of 3'-3/4" as shown in the Standard. The PF-1 rail height is given as 4'-2". The value shown in the Standard is 3'-6".

The Bridge Standards need to be revised for clarity and to correctly reflect the materials as originally crash tested.

The Standard Specifications do not state that the bridge rail is to be built continuous with out joints. The materials for the posts in the bridge rail TF-2 are not called out as high strength steel.

PROPOSED SOLUTION: The Indiana Design Manual Figure 404-4B has been revised. The Bridge Standards listed here are proposed with revisions as noted.

The Standard Specifications section 706 can be revised to include a statement that the bridge rail is to be built without joints.

Section 910.20 can be revised to include the correct steel strength for the railing posts.

Proposed changes:

- 706-BCBR-01 - 03Revise (new designation BRSF)
- 706-BCBR-04Delete
- 706-BRPP-01 - 06.....Revise
- 706-BRTF-01 - 03.....Revise
- 706-BRTF-04 - 09.....Delete
- 706-BRTM-01 - 02Delete
- 706-BRTX-01 - 04.....Revise
- 706-TBRC-01 - 03Revise (new designation BRTR)
- 706-TBRE-01.....Delete
- 706-TBRC-04 - 06New Standards Sheets BRTR
- 706-TBRF-01 - 02.....Delete

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS
REVISION TO STANDARD SPECIFICATIONS, STANDARD DRAWINGS AND DESIGN MANUAL

APPLICABLE STANDARD SPECIFICATIONS: 706 and 910.20

APPLICABLE STANDARD DRAWINGS:

706-BCBR-01 - 03
706-BCBR-04
706-BRPP-01 - 06
706-BRTF-01 - 03
706-BRTF-04 - 09
706-BRTM-01 - 02
706-BRTX-01 - 04
706-TBRC-01 - 03
706-TBRE-01
706-TBRF-01 - 02

Note: Supporting and backup materials (Crash Test Details) for this item available at:
<http://www.in.gov/dot/div/contracts/standards/sc/2012/feb/CrashTestDetails.pdf>

APPLICABLE DESIGN MANUAL SECTION: Figure 404-4B

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: none

PAY ITEMS AFFECTED: none

Submitted By: Randy Strain

Title: Bridge Standards Engineer

Organization: INDOT

Phone Number: 317-232-3339

Date: 1/23/12

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

SPECIFICATIONS, SPECIAL PROVISIONS AND DRAWINGS
REVISION TO STANDARD SPECIFICATIONS, STANDARD DRAWINGS AND DESIGN MANUAL
(STANDARD DRAWINGS 706 SERIES DESIGNATIONS)

STANDARD DRAWINGS 706 SERIES DESIGNATIONS
Current designations listed first, alphabetically

Current Designation	Proposed Designation	Proposed Meaning	Device Designation
BCBR	BRSF	Bridge Railing Shape F	FC, FT
BRPP	[unchanged]	Bridge Railing Pedestrian Parapet	PF-1, PF-2, PS-1, PS-2
BRRW	MSRW	Moment Slab at Retaining Wall	[same]
BRTF	[unchanged]	Bridge Railing TF-2	TF-2
BRTM	[delete]	[Bridge Railing CF-1]	[delete]
BRTX	[unchanged]	Bridge Railing TX	TX
CBRT	[unchanged]	Concrete Bridge Railing Transition	[same]
TASE	TBAE	Transition Bridge Approach Extension	RCBA extension
TBRC,E,F	BRTR	Bridge Railing TR	TR
TPBT	TTTF	Transition Thrie TF-2	TTF-2, was TPBT
TTBC	TTFC	Transition Thrie FC	TFC, was TBC
TTBP	TTPP	Transition Thrie Pedestrian Parapet	TPF-1, TPF-2, TPS-1, TPS-2
TTBT	TTFT	Transition Thrie FT	TFT, was TBT
TTTX	[unchanged]	Transition Thrie TX	TTX
TWBC	TWFC	Transition W-beam FC	WFC, was WBC

Proposed designations listed first, alphabetically

Proposed Designation	Current Designation	Proposed Meaning	Device Designation
BRPP	[same]	Bridge Railing Pedestrian Parapet	PF-1, PF-2, PS-1, PS-2
BRSF	BCBR	Bridge Railing Shape F	FC, FT
BRTF	[same]	Bridge Railing TF-2	TF-2
BRTR	TBRC,E,F	Bridge Railing TR	TR
BRTX	[same]	Bridge Railing TX	TX
CBRT	[same]	Concrete Bridge Railing Transition	[same]
MSRW	BRRW	Moment Slab at Retaining Wall	[same]
TBAE	TASE	Transition Bridge Approach Extension	RCBA extension
TTFC	TTBC	Transition Thrie FC	TFC, was TBC
TTFT	TTBT	Transition Thrie FT	TFT, was TBT
TTPP	TTBP	Transition Thrie Pedestrian Parapet	TPF-1, TPF-2, TPS-1, TPS-2
TTTF	TPBT	Transition Thrie TF-2	TTF-2, was TPBT
TTTX	[same]	Transition Thrie TX	TTX
TWFC	TWBC	Transition W-beam FC	WFC, was WBC
[delete]	BRTM	[Bridge Railing CF-1]	[delete]

COMPATIBILITY OF BRIDGE POSITIVE-PROTECTION DEVICES
Alphabetical order by bridge-railing designation

Bridge Railing	Bridge-Railing Transition	RCBA Extension	Guardrail Transition
FC	TBC to TFC	16'-5"	TGB
FC	WBC to WFC	18'-0"	WGB
FT	TBT to TFT	20'-6"	TGB
PF-1	TPF-1	16'-5"	TGB
PF-2	TPF-2	16'-5"	TGB
PS-1	TPS-1	16'-5"	TGB
PS-2	TPS-2	16'-5"	TGB
TF-2	TPBT to TTF-2	20'-6"	TGB
TR	[none]	[none]	TGB
TX	TTX	20'-6"	TGB

REVISION TO STANDARD SPECIFICATIONS

SECTION 706 - BRIDGE RAILINGS

706.03 CONCRETE RAILING

The Standard Specifications are revised as follows:

SECTION 706, AFTER LINE 42, INSERT AS FOLLOWS:

Concrete bridge railing shall be built monolithically and continuous from support to support. A joint shall be provided at the end of the bridge between the bridge railing and the railing transition as shown on the plans.

APPROVED MINUTES

REVISION TO STANDARD SPECIFICATIONS

SECTION 910 - METAL MATERIALS

910.20 STEEL BRIDGE RAILING COMPONENTS

The Standard Specifications are revised as follows:

SECTION 910, BEGIN LINE 1400, DELETE AND INSERT AS FOLLOWS:

910.20 Steel Bridge Railing Components

Materials for steel bridge railing components shall be in accordance with the following:-

- (a) Railing *and posts* tubing shall be in accordance with ASTM A 500, Grade B.
- (b) Posts, connection plates, splice bars, base plates, and anchor channel bars shall be in accordance with ASTM A 709, Grade 36 (A-36M). *High strength steel posts and connection plates shall be in accordance with ASTM A 709, Grade 50.*

SECTION 910, BEGIN LINE 1424, DELETE AND INSERT AS FOLLOWS:

- (h) Anchor bolts shall be ~~stainless steel galvanized and~~ in accordance with ~~ASTM A 276, type 305 or 430. However, they shall have a minimum ultimate strength of 100 ksi (690 MPa)~~ 910.02(g)1. Threads may be cut or rolled.

APPROVED

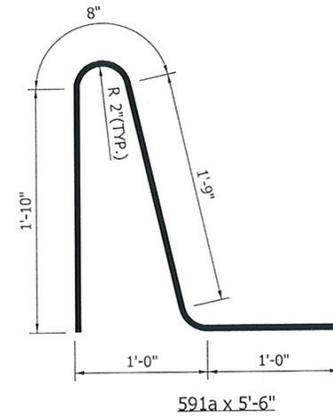
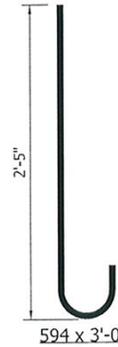
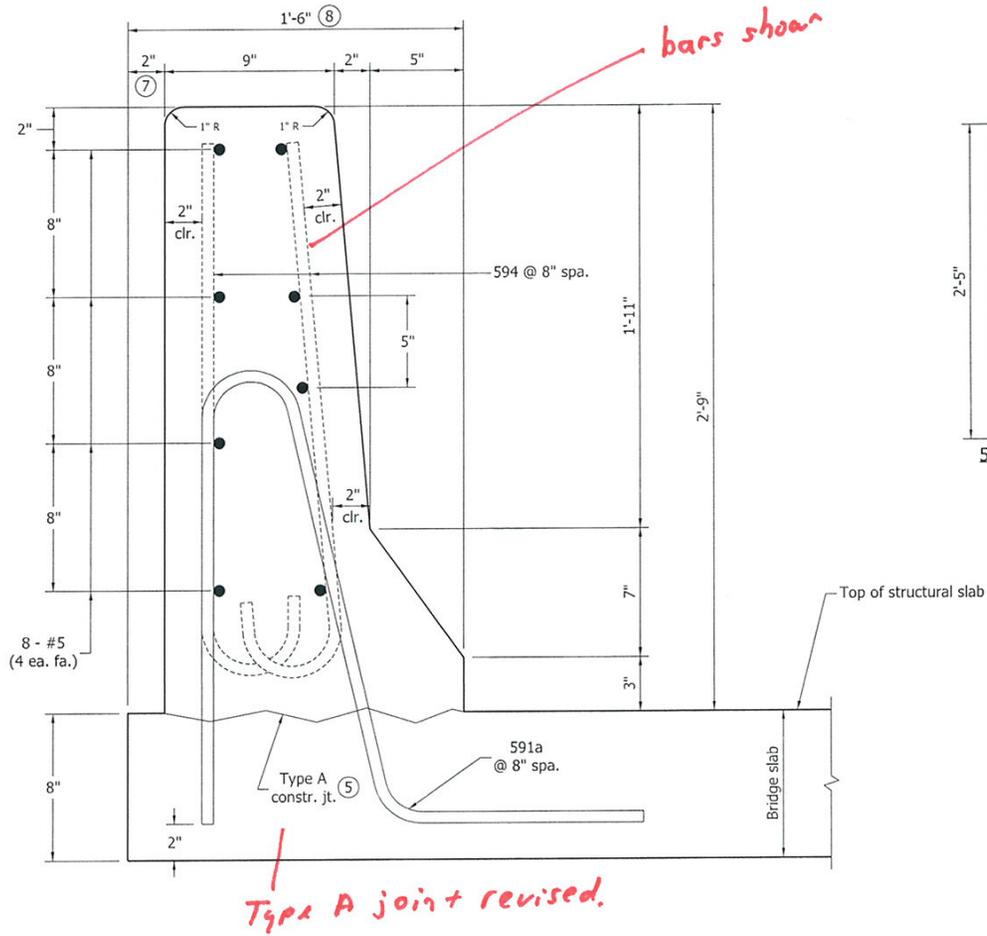
REVISION TO STANDARD DRAWINGS

EXISTING 706-BCBR-01 BRIDGE RAILING TYPE FC (WITH MARKUPS)

NOTE:

1. See Standard Drawing E 706-BCBR-04 for General Notes.

Notes revised.

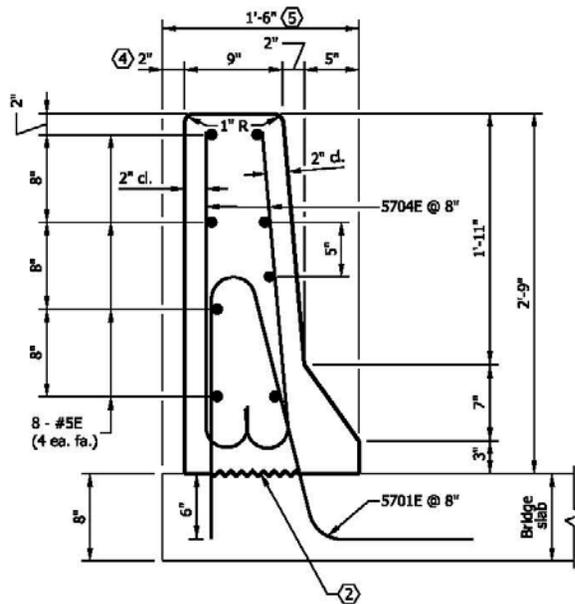


Type A joint revised.

INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TYPE FC	
SEPTEMBER 2009	
STANDARD DRAWING NO.	E 706-BCBR-01
	<i>/s/ Richard L. VanCleave</i> 09/01/09 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/01/09 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

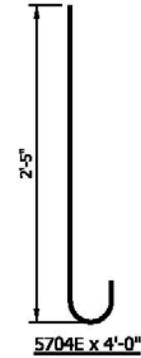
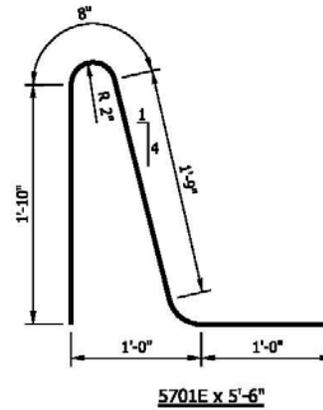
REVISION TO STANDARD DRAWINGS

REVISED 706-BCBRBSF-01 BRIDGE RAILING TYPE FC (DRAFT)



NOTES

1. See Standard Drawing E 706-BRSF-03 for General Notes (4).
2. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.

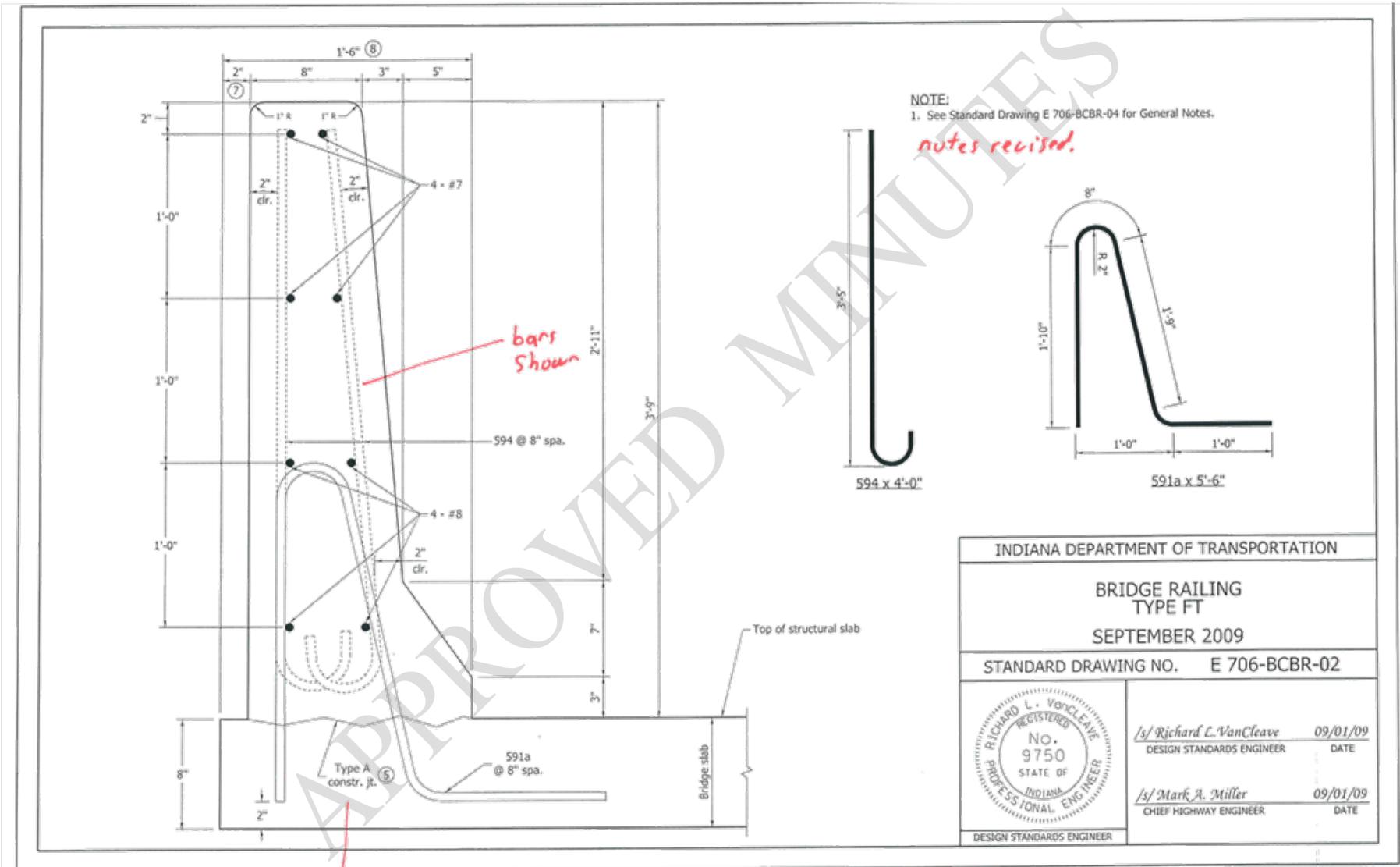


QUANTITIES FOR ONE RUNNING FOOT OF RAILING	
Concrete, class C	2.58 CFT
Reinforcing bars	26.3 LBS

INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TYPE FC	
SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRSF-01	
DESIGN STANDARDS ENGINEER	DESIGN STANDARDS ENGINEER DATE
	CHIEF HIGHWAY ENGINEER DATE

REVISION TO STANDARD DRAWINGS

EXISTING 706-BCBR-02 BRIDGE RAILING TYPE FT (WITH MARKUPS)



Type A joint revised.

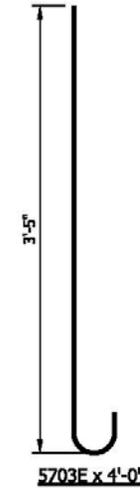
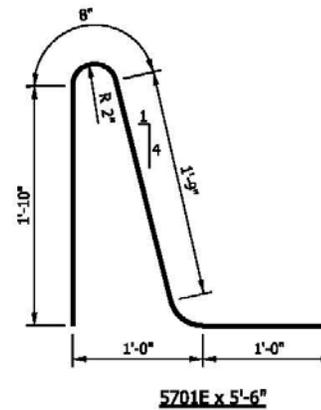
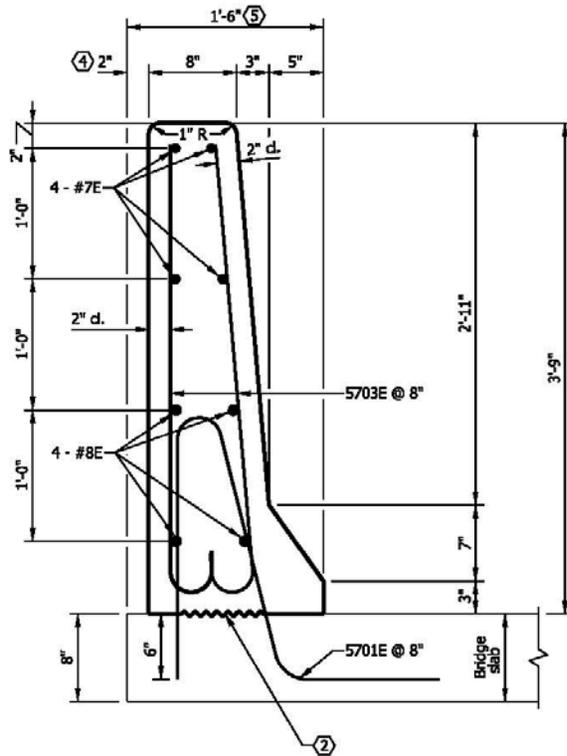
INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TYPE FT	
SEPTEMBER 2009	
STANDARD DRAWING NO. E 706-BCBR-02	
	<i>/s/ Richard L. VanCleave</i> 09/01/09 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/01/09 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

REVISED 706-BCBRBSF-02 BRIDGE RAILING TYPE FT (DRAFT)

NOTES

1. See Standard Drawing E 706-BRSF-03 for General Notes
2. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.

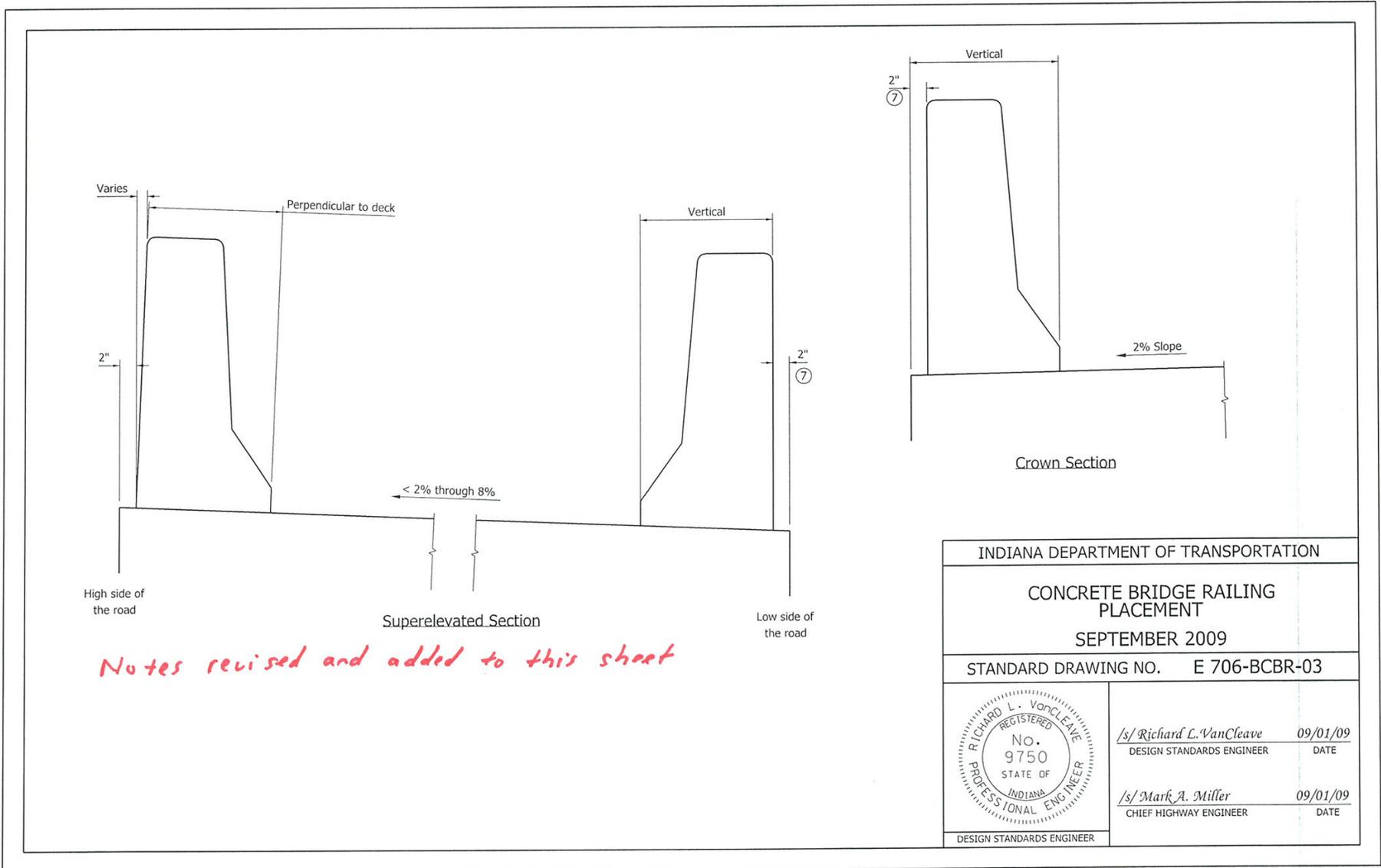


QUANTITIES FOR ONE RUNNING FOOT OF RAILING	
Concrete, class C	3.29 CFT
Reinforcing bars	40.0 LBS

INDIANA DEPARTMENT OF TRANSPORTATION	
BRIDGE RAILING TYPE FT	
SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRSF-02	
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

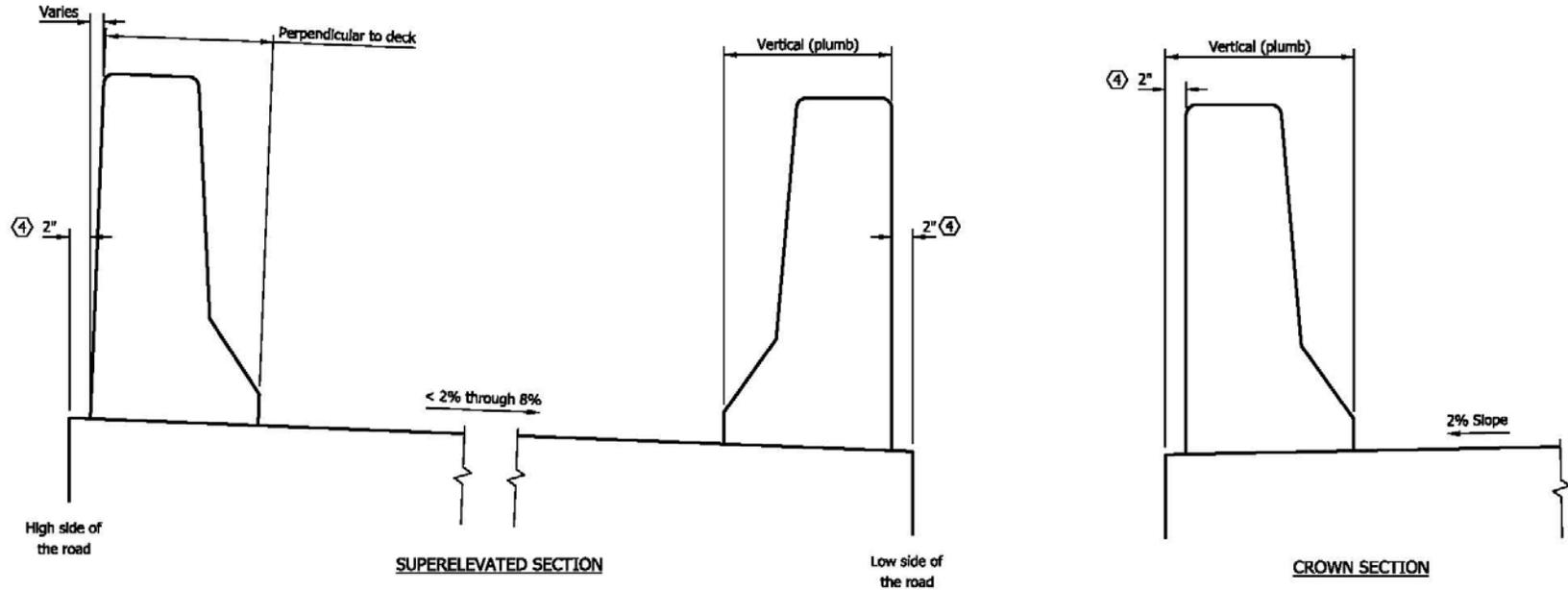
REVISION TO STANDARD DRAWINGS

EXISTING 706-BCBR-03 CONCRETE BRIDGE PLACEMENT (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

REVISED 706-~~BCBR~~BRSF-03 CONCRETE BRIDGE RAILING PLACEMENT (DRAFT)



GENERAL NOTES

1. Minimum lap for #5 bars shall be 1'-11".
- ② Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.
3. A joint shall be provided between the bridge railing and railing transition at the end of the bridge slab as shown on Standard Drawing E 706-CBRT-01.
- ④ For twin structures or other structures which are placed side by side, this dimension shall be reduced to 0 on the median side.
- ⑤ For twin structures or other structures which are placed side by side, this dimension shall be reduced to 1'-4" on the median side.
6. All reinforcing bars designated E shall be epoxy coated.

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BRIDGE RAILING PLACEMENT	
SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRSF-03	
	DESIGN STANDARDS ENGINEER DATE
	CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

EXISTING 706-BCBR-04 BRIDGE RAILING TYPE FC (PROPOSED TO DELETE)

GENERAL NOTES:

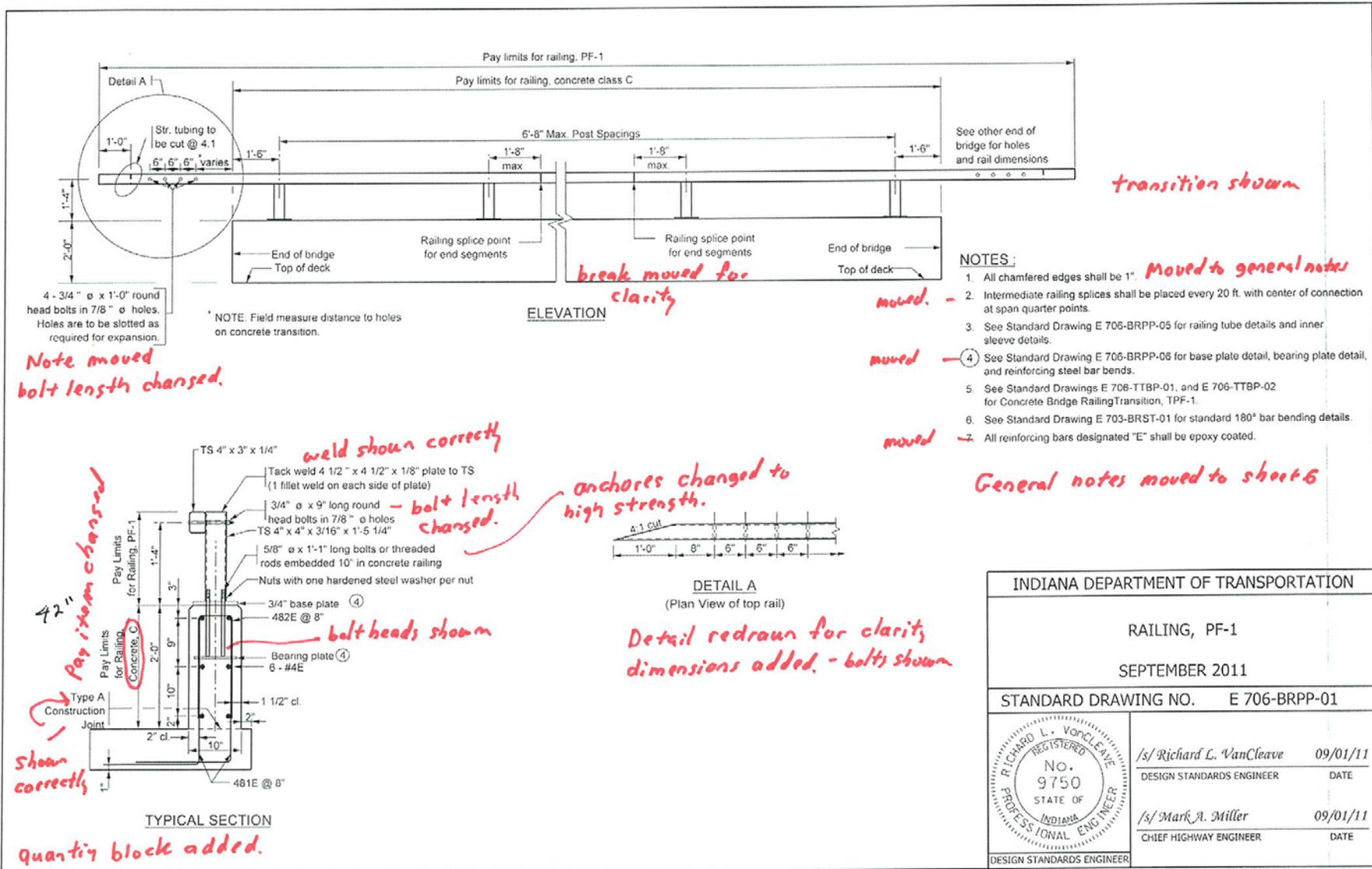
1. See Standard Drawing E 703-BRST-01 for bar bending details and reinforcing bar notes.
2. Reinforcing steel in bridge railing to be epoxy coated.
3. Minimum lap for #5 bars is 1'-11".
4. Concrete in bridge railing to be class C.
- ⑤ See Standard Drawing E 724-BJTS-01 for construction joint type A.
6. Concrete bridge railing shall be built monolithically and continuous from end support to end support. A joint shall be provided between the bridge railing and railing transition at the end of the bridge slab as shown on Standard Drawing E 706-CBRT-01.
- ⑦ For twin structures or other structures which are placed side by side, this dimension shall be reduced to 0 on the median side.
- ⑧ For twin structures or other structures which are placed side by side, this dimension shall be reduced to 1'-4" on the median side.

Notes moved to sheet 03

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BRIDGE RAILING	
SEPTEMBER 2009	
STANDARD DRAWING NO. E 706-BCBR-04	
	<i>/s/ Richard L. VanCleave</i> 09/01/09 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/01/09 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

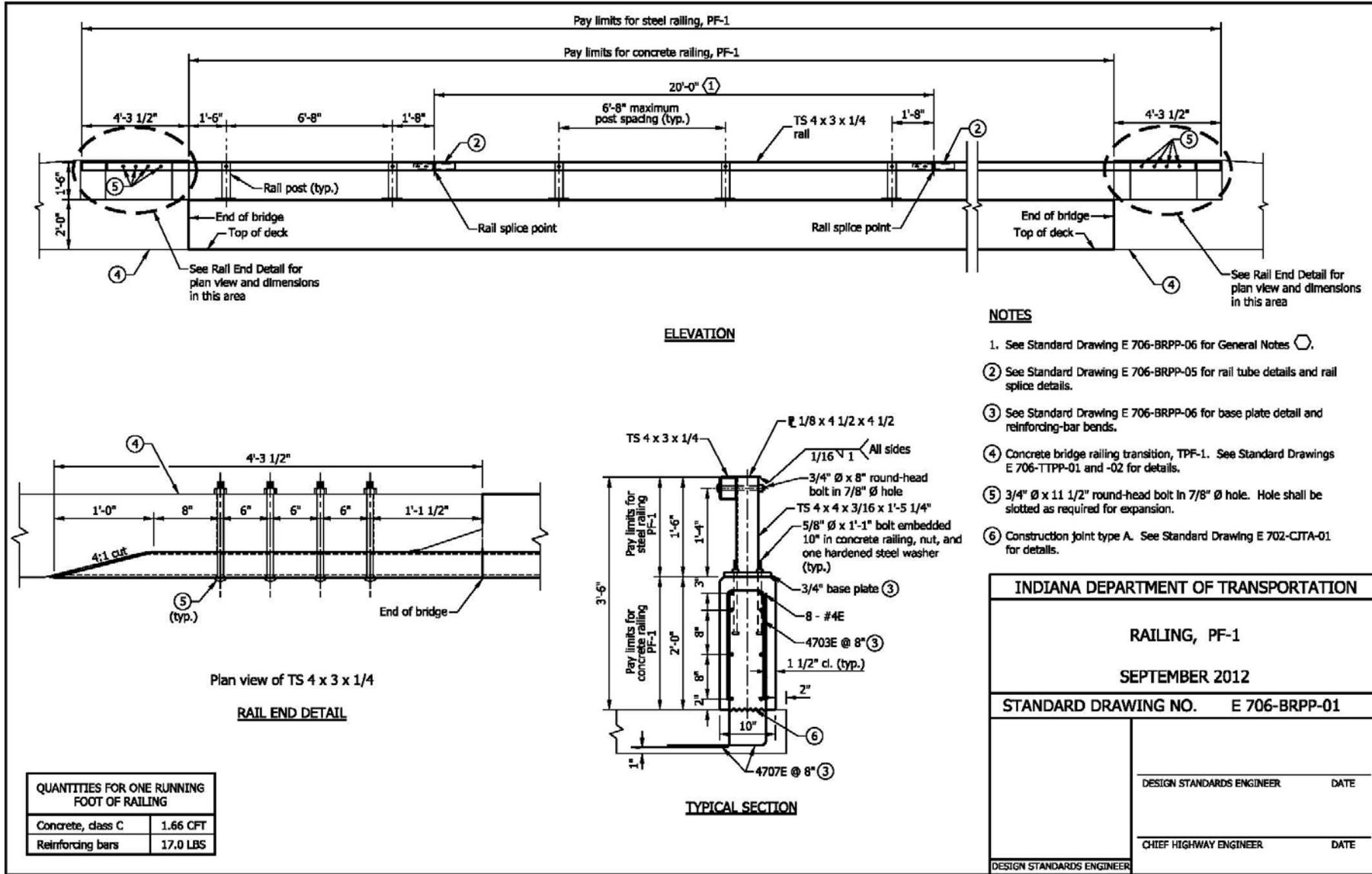
EXISTING 706-BRPP-01 RAILING, PF-1 (WITH MARKUPS)



Design Manual lists this as a 4'-2" rail. *This is a Tk-9 railing*

REVISION TO STANDARD DRAWINGS

REVISED 706-BRPP-01 RAILING, PF-1 (DRAFT)



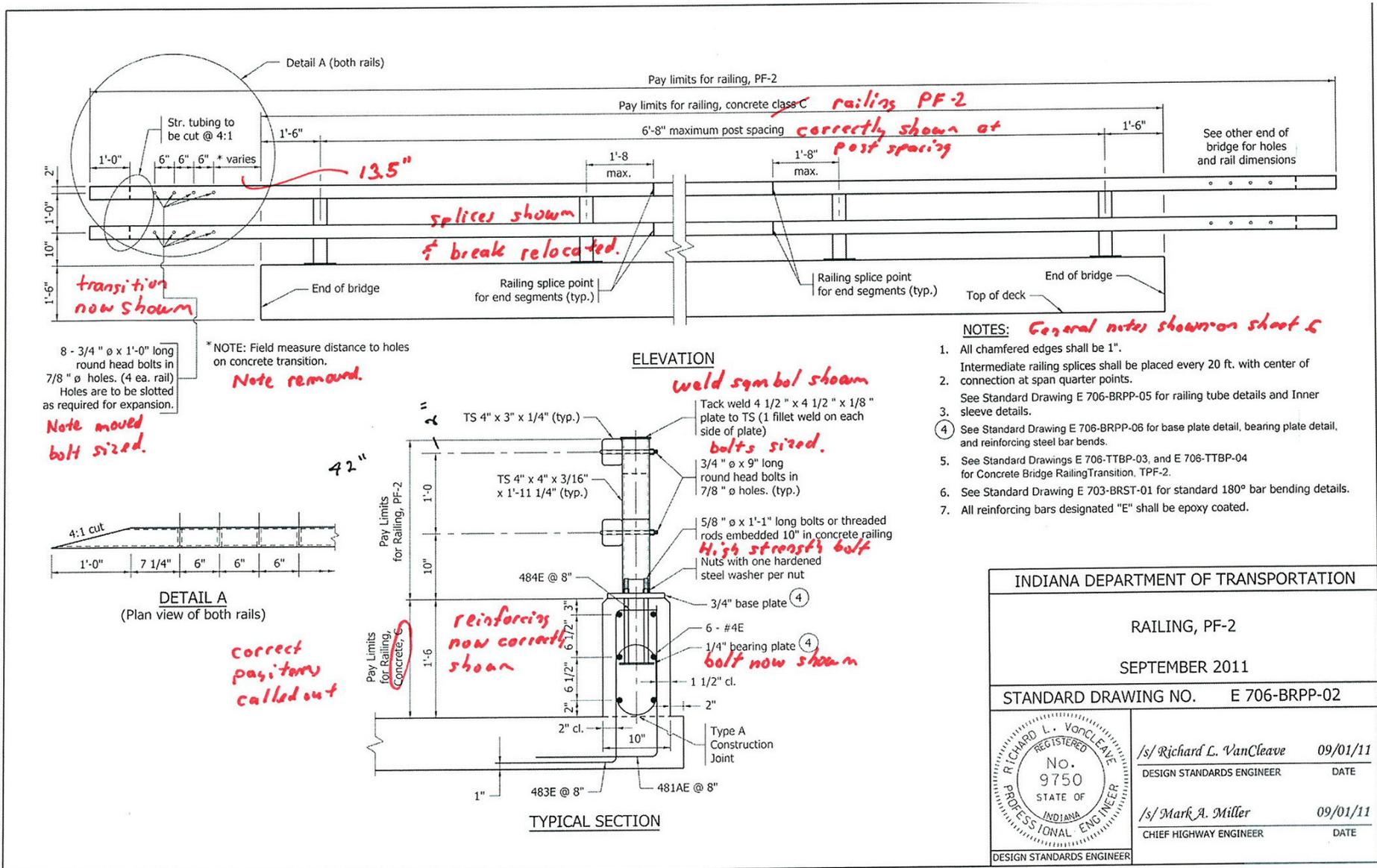
NOTES

1. See Standard Drawing E 706-BRPP-06 for General Notes (1).
2. See Standard Drawing E 706-BRPP-05 for rail tube details and rail splice details.
3. See Standard Drawing E 706-BRPP-06 for base plate detail and reinforcing-bar bends.
4. Concrete bridge railing transition, TPF-1. See Standard Drawings E 706-TTPP-01 and -02 for details.
5. 3/4" Ø x 1 1/2" round-head bolt in 7/8" Ø hole. Hole shall be slotted as required for expansion.
6. Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.

INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING, PF-1	
SEPTEMBER 2012	
STANDARD DRAWING NO.	E 706-BRPP-01

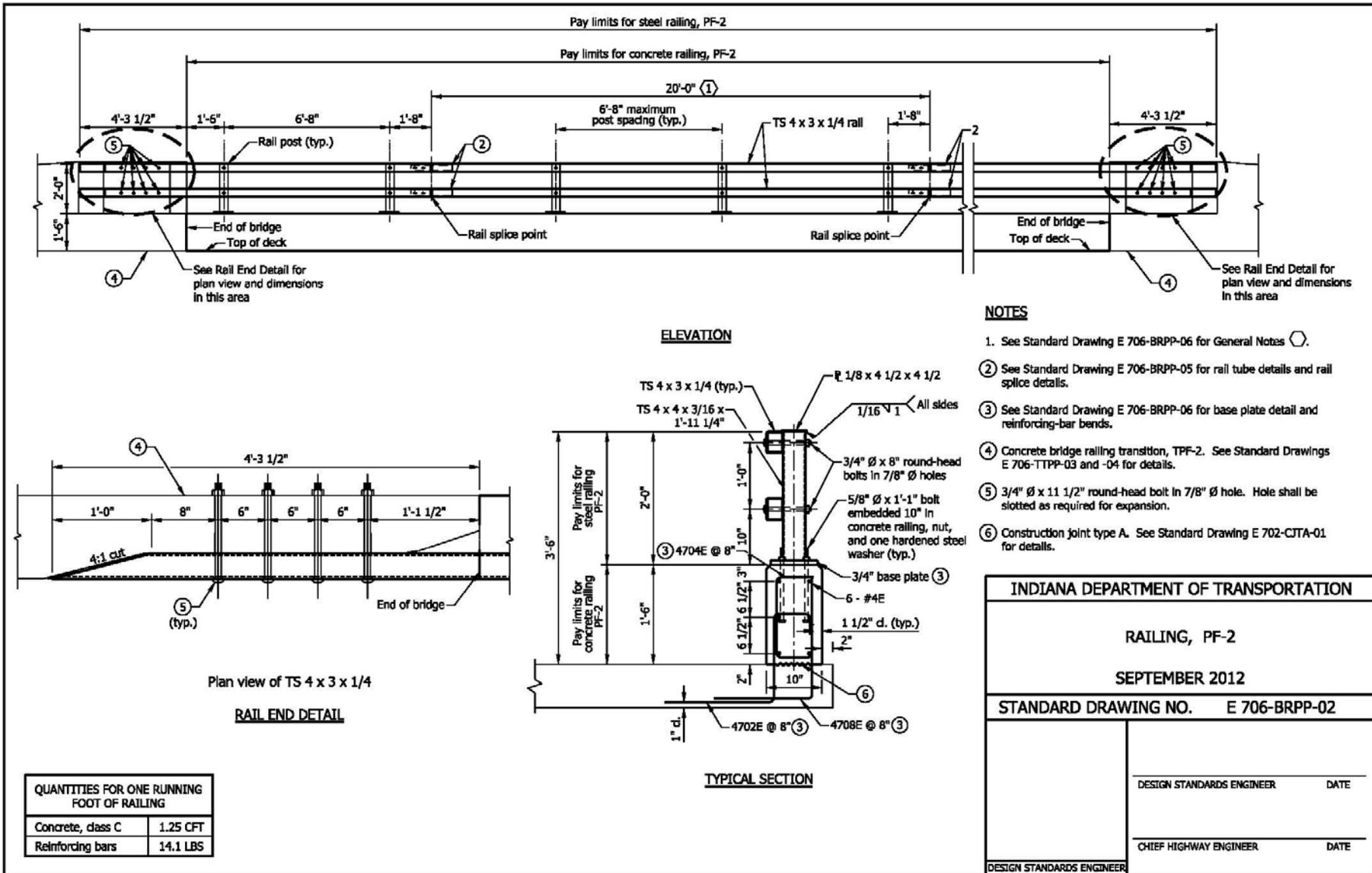
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRPP-02 RAILING, PF-2 (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

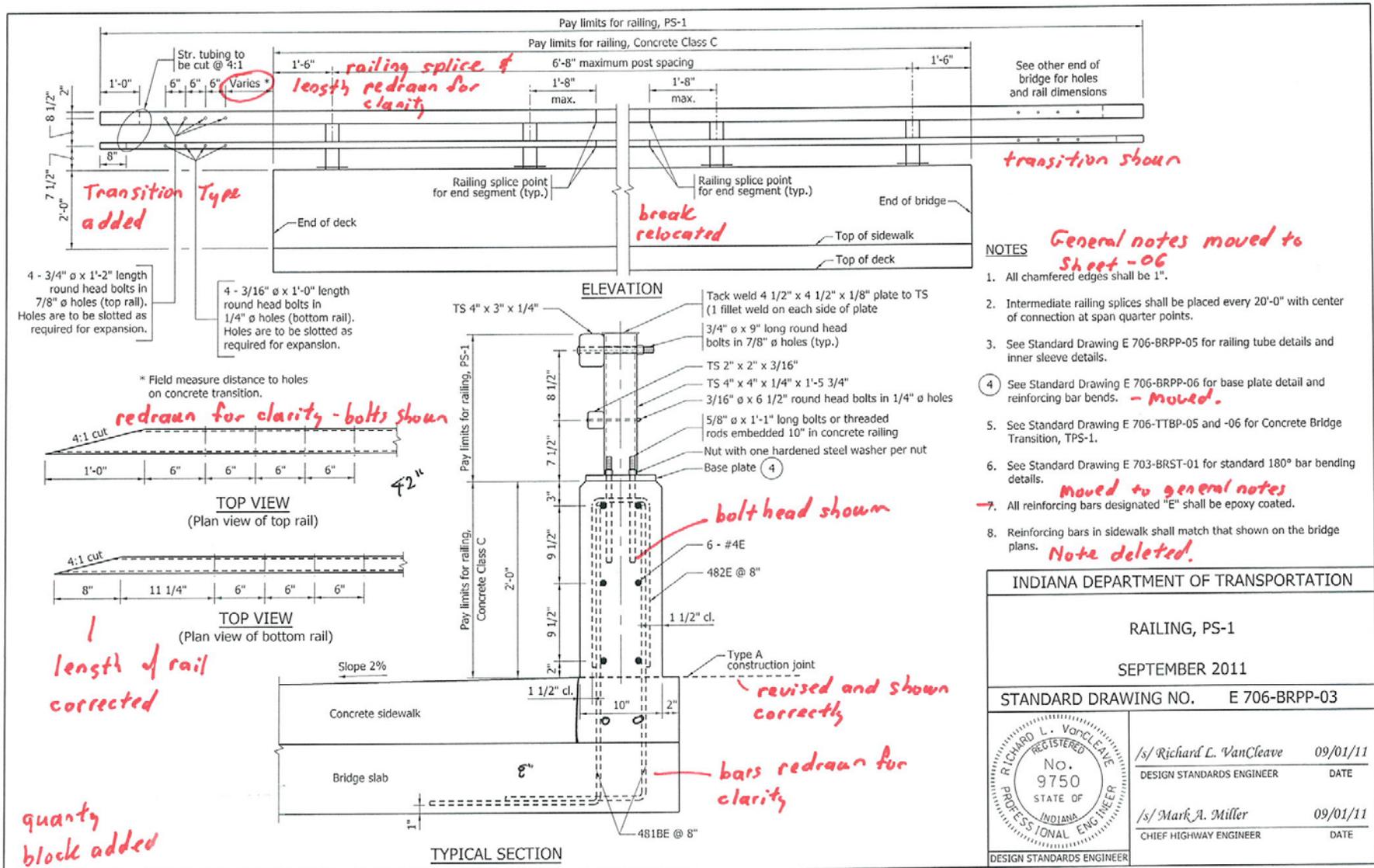
REVISED 706-BRPP-02 RAILING, PF-2 (DRAFT)



INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING, PF-2	
SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRPP-02	
	DESIGN STANDARDS ENGINEER DATE
	CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

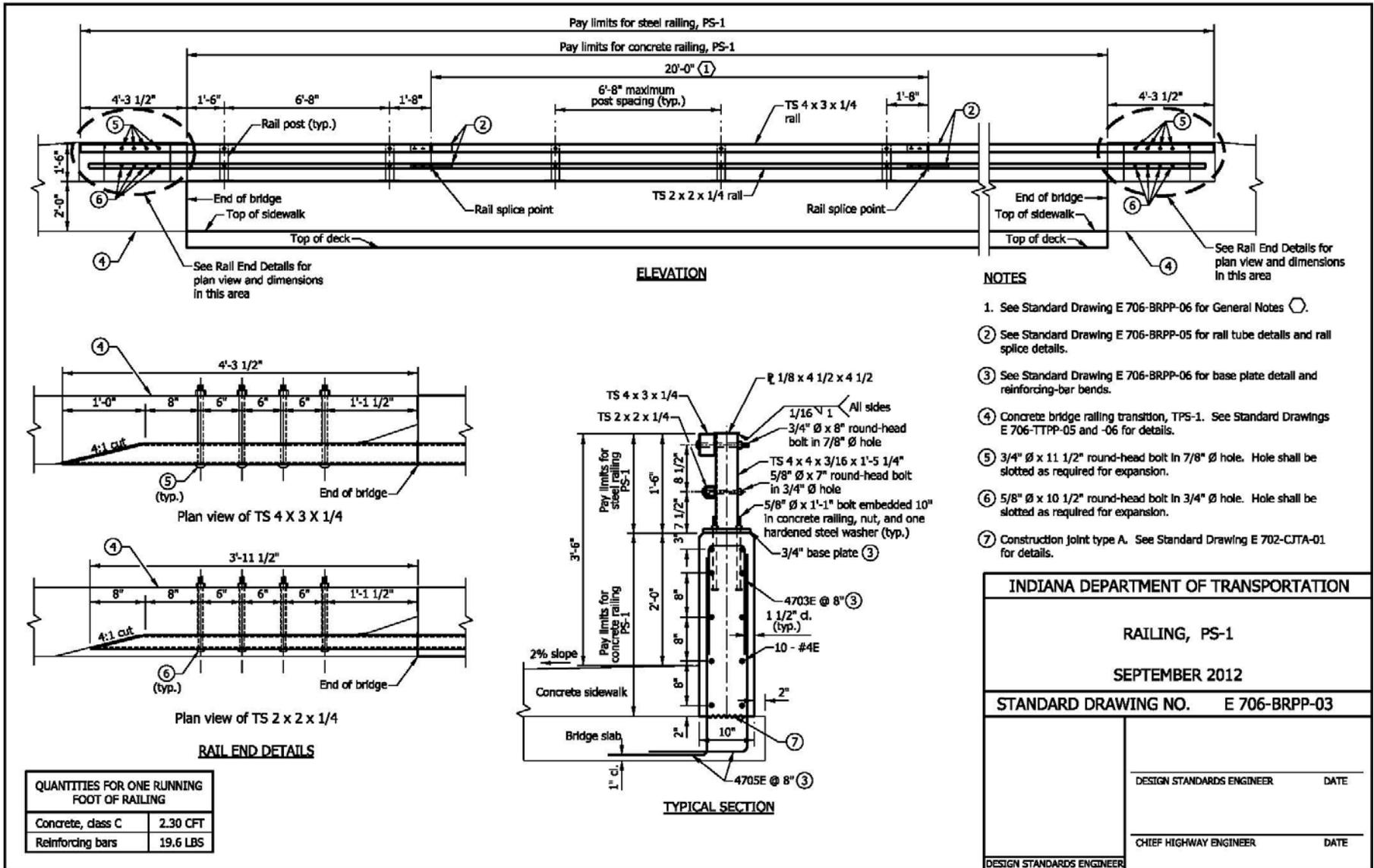
EXISTING 706-BRPP-03 RAILING, PS-1 (WITH MARKUPS)



This is a TL-9 railing

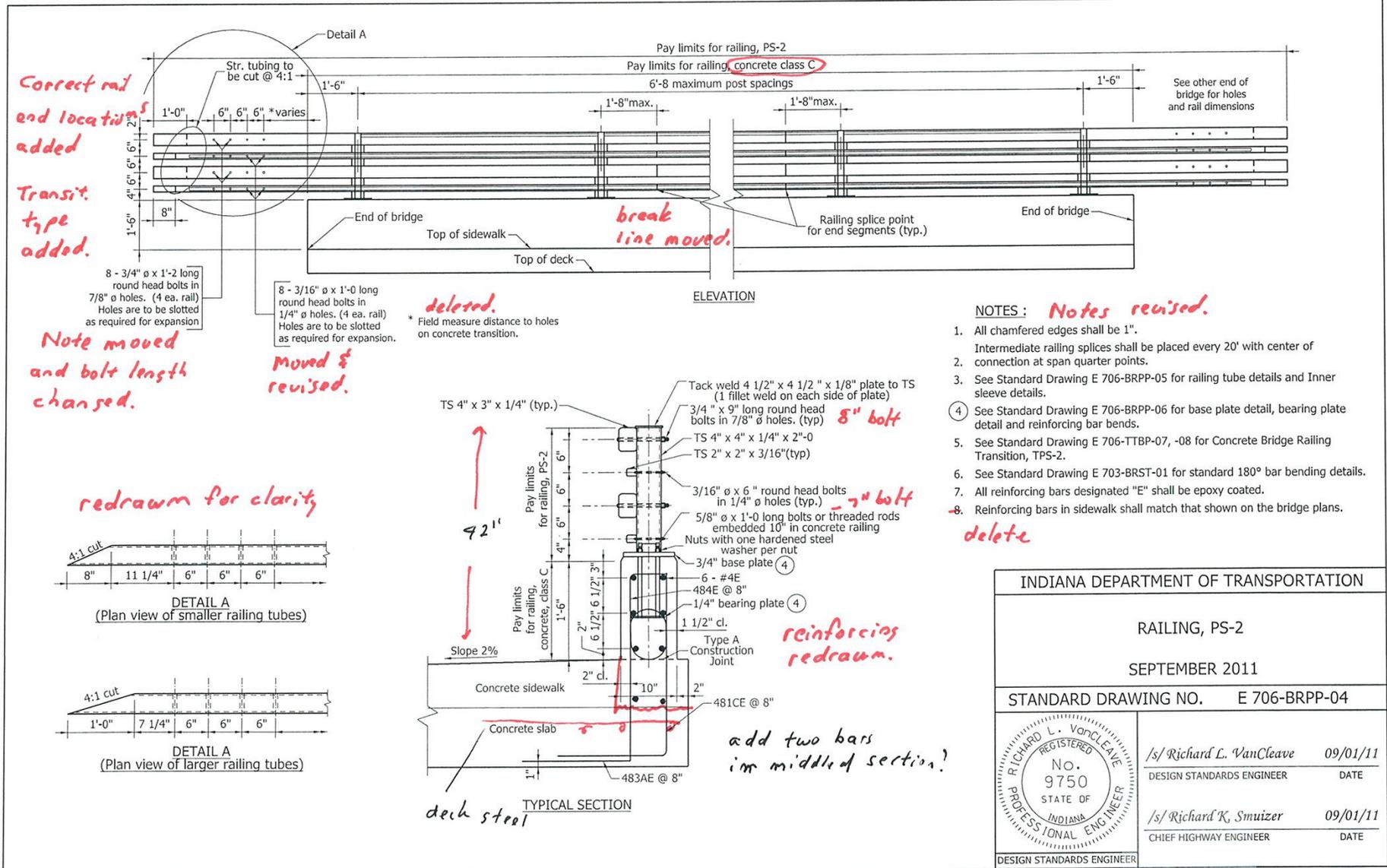
REVISION TO STANDARD DRAWINGS

REVISED 706-BRPP-03 RAILING, PS-1 (DRAFT)



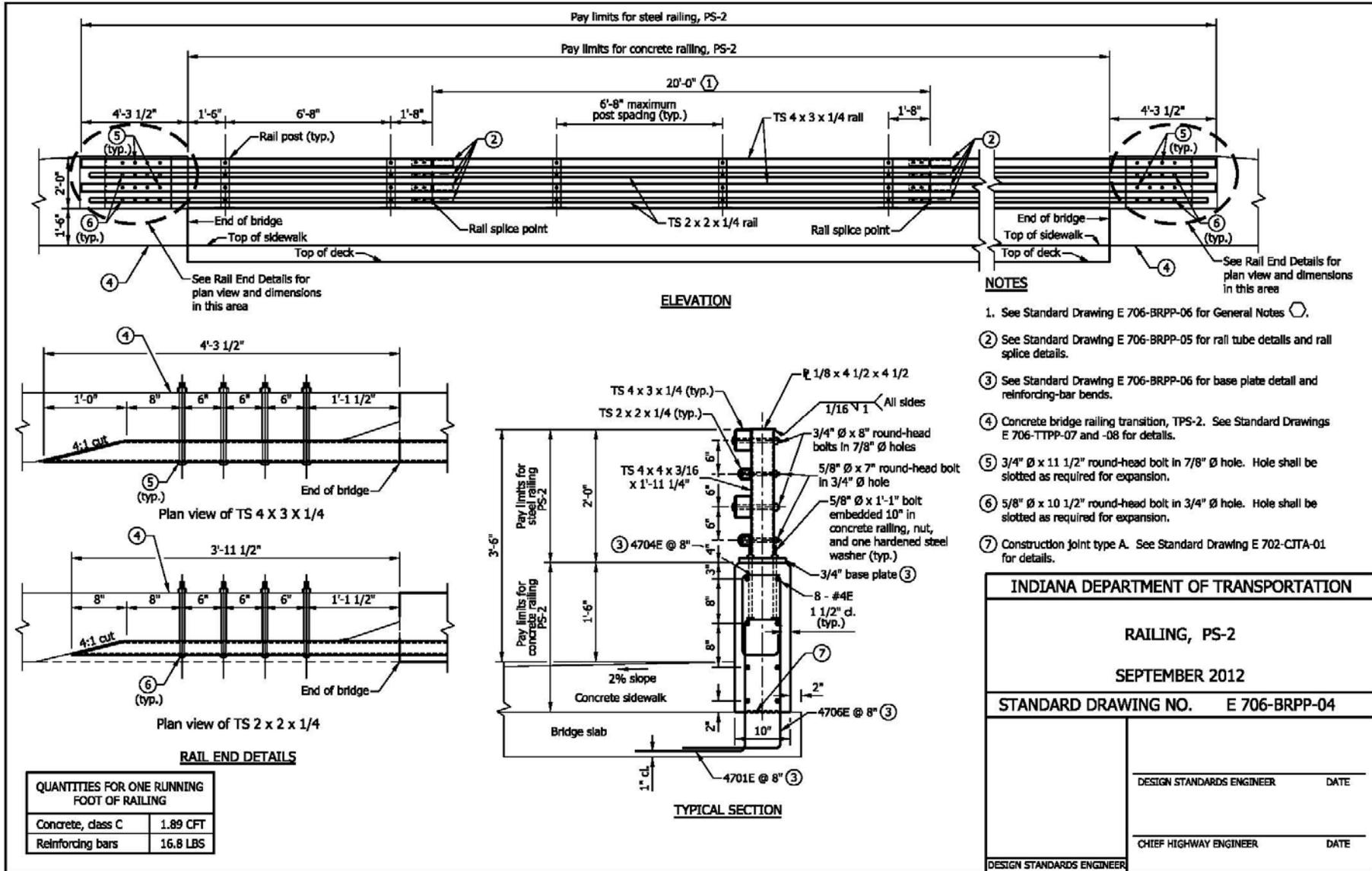
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRPP-04 RAILING, PS-2 (WITH MARKUPS)



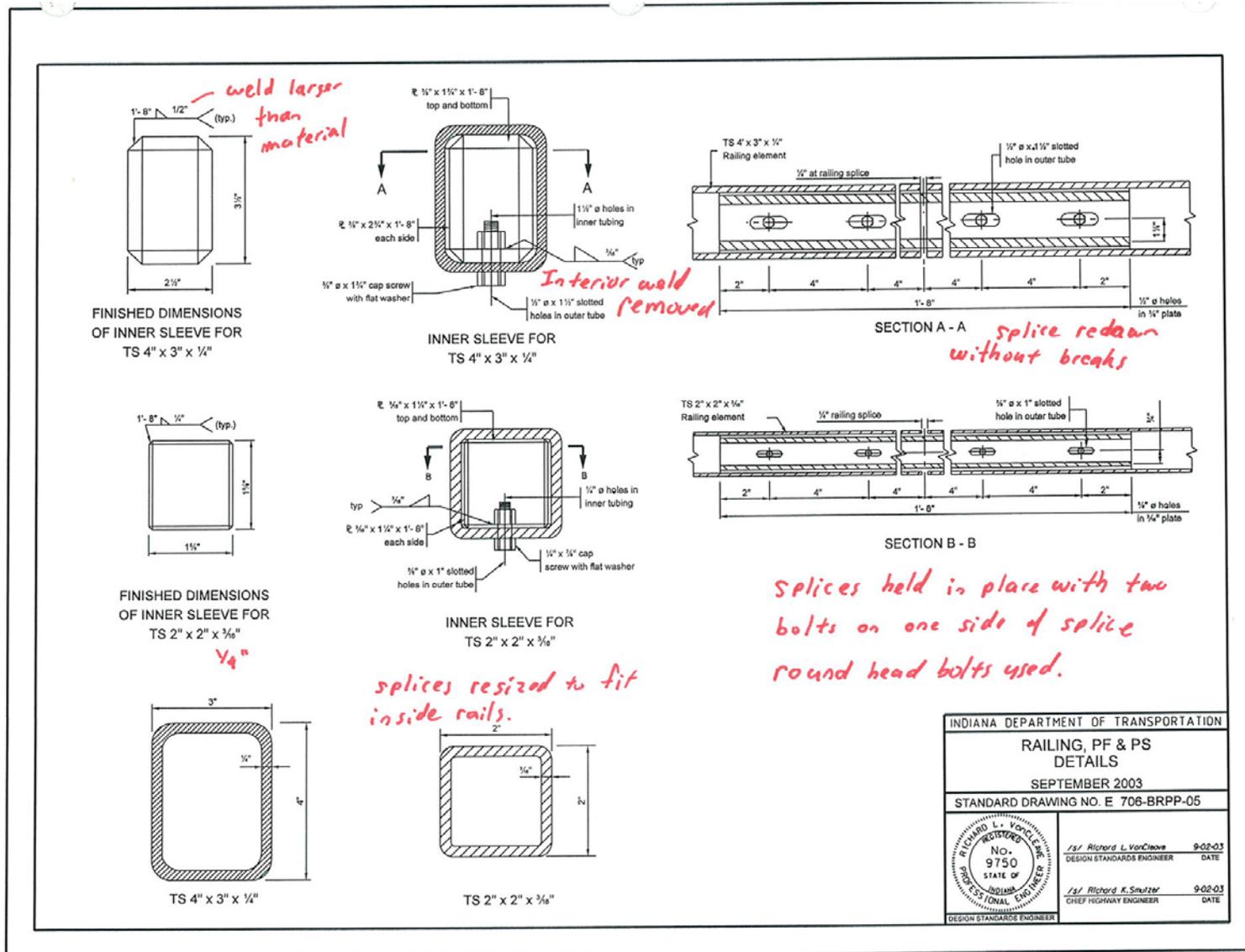
REVISION TO STANDARD DRAWINGS

REVISED 706-BRPP-04 RAILING, PS-2 (DRAFT)



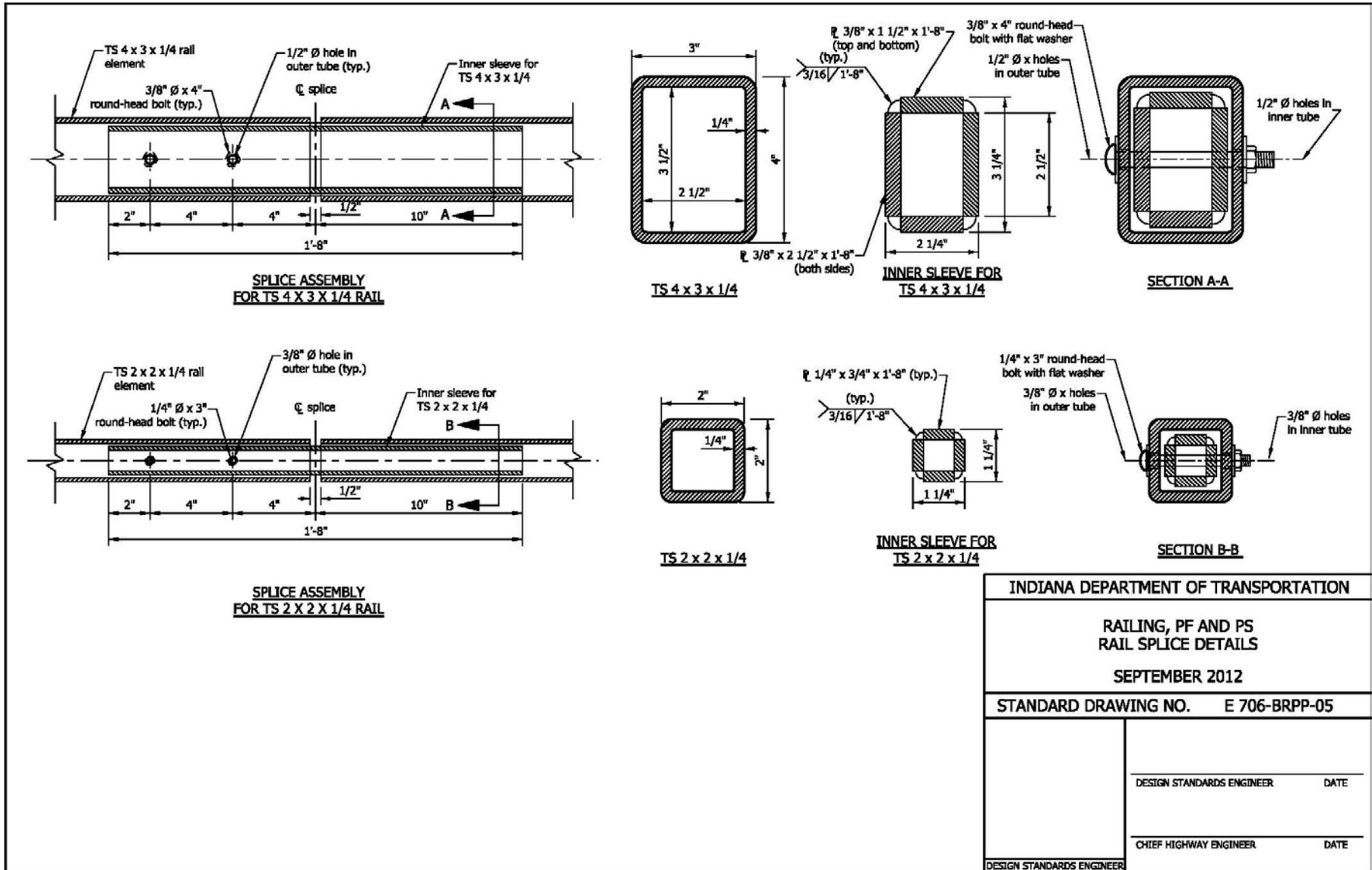
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRPP-05 RAILING, PF & PS DETAILS (WITH MARKUPS)



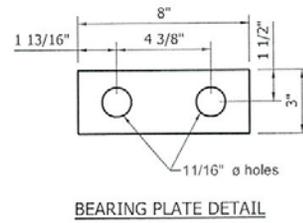
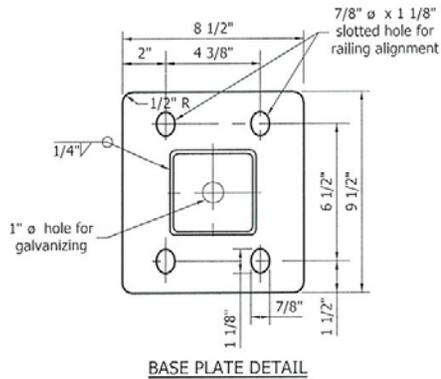
REVISION TO STANDARD DRAWINGS

REVISED 706-BRPP-05 RAILING, PF AND PS RAIL SPLICE DETAILS (DRAFT)



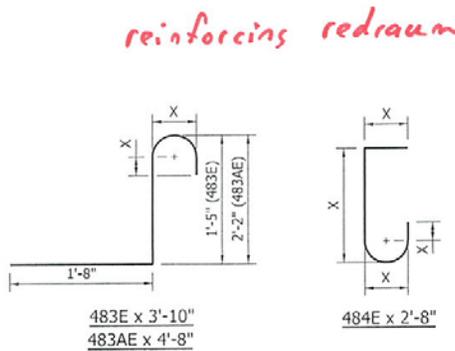
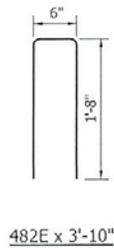
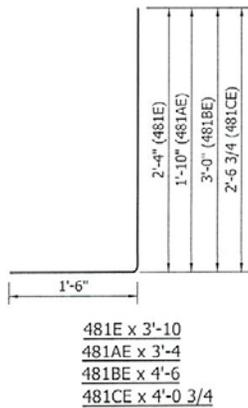
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRPP-06 RAILING, PF & PS DETAILS (WITH MARKUPS)



NOTES:

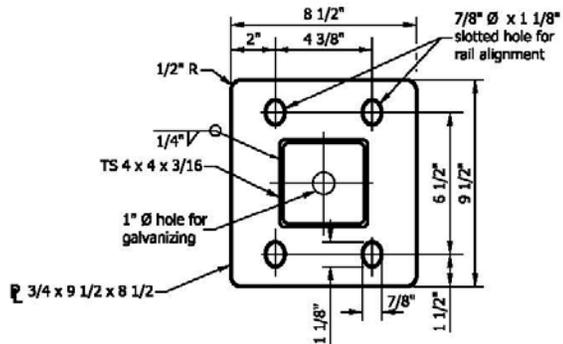
1. See Standard Drawing E 703-BRST-01 for standard 180° bar bending details.
2. All reinforcing bars designated "E" shall be epoxy coated.



INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING, PF & PS DETAILS	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 706-BRPP-06
	/s/ Richard L. VanCleave 09/01/11 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smuizer 09/01/11 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

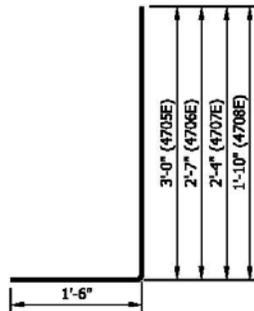
REVISED 706-BRPP-06 RAILING, PF & PS DETAILS (DRAFT)



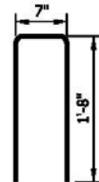
BASE PLATE DETAIL

GENERAL NOTES

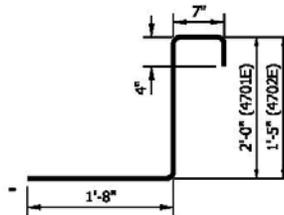
- ① Intermediate railing splices shall be placed every 20 ft.
2. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.
3. All chamfered edges shall be 3/4".
4. All reinforcing bars designated E shall be epoxy coated.



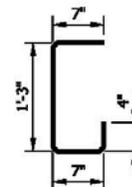
4705E x 4'-6"
4706E x 4'-1"
4707E x 3'-10"
4708E x 3'-4"



4703E x 3'-11"



4701E x 4'-7"
4702E x 4'-0"



4704E x 2'-9"

INDIANA DEPARTMENT OF TRANSPORTATION

RAILING, PF & PS
 DETAILS

SEPTEMBER 2012

STANDARD DRAWING NO. E 706-BRPP-06

	DESIGN STANDARDS ENGINEER	DATE
	CHIEF HIGHWAY ENGINEER	DATE

DESIGN STANDARDS ENGINEER

REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-01 CONCRETE BRIDGE RAILING TYPE TF-2 (WITH MARKUPS)

3'-8" to first post on bridge

Transition shown TPBT

Notes removed dimension added

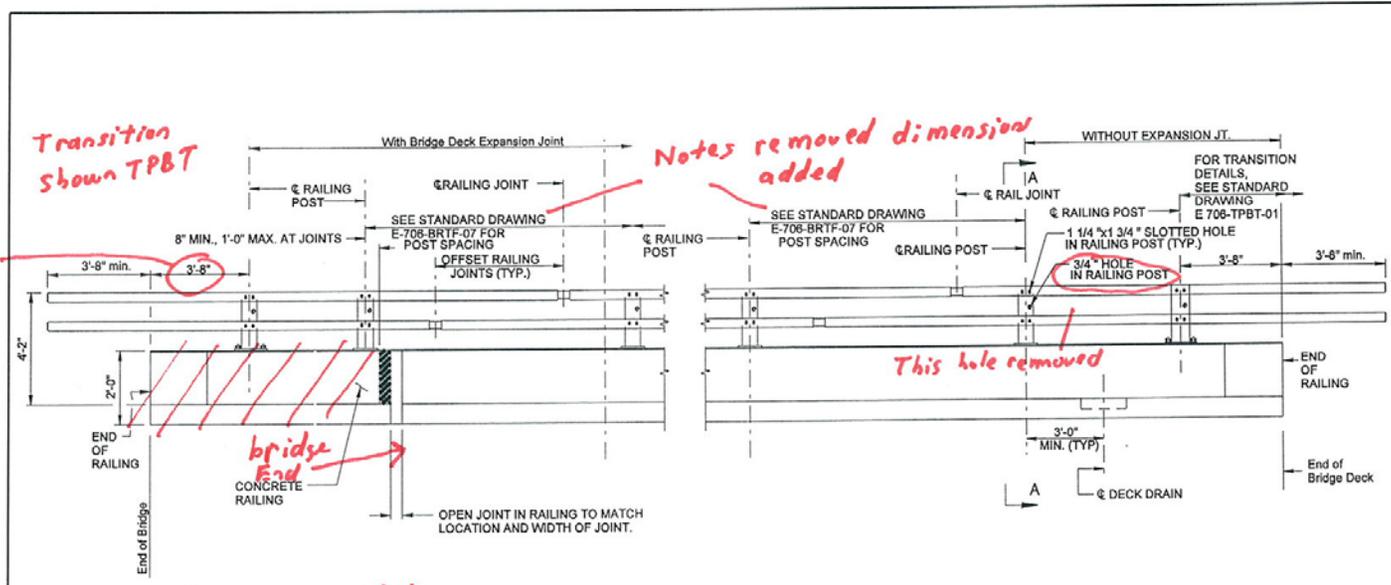
This hole removed

*Typical Section added
 rail end detail added*

NOTES: *Revised - added.*

1. See Standard Drawing E 706-BRTF-02 FOR SECTION A - A. *Section placed on sheet*
2. See Standard Drawing E 703-BRST-01 for bending details and reinforcing steel notes. *- Note move to sheet with bent bar*
3. Pay limits for concrete bridge railing Type TF-2 to end of railing. *limits shown*

quantity block added



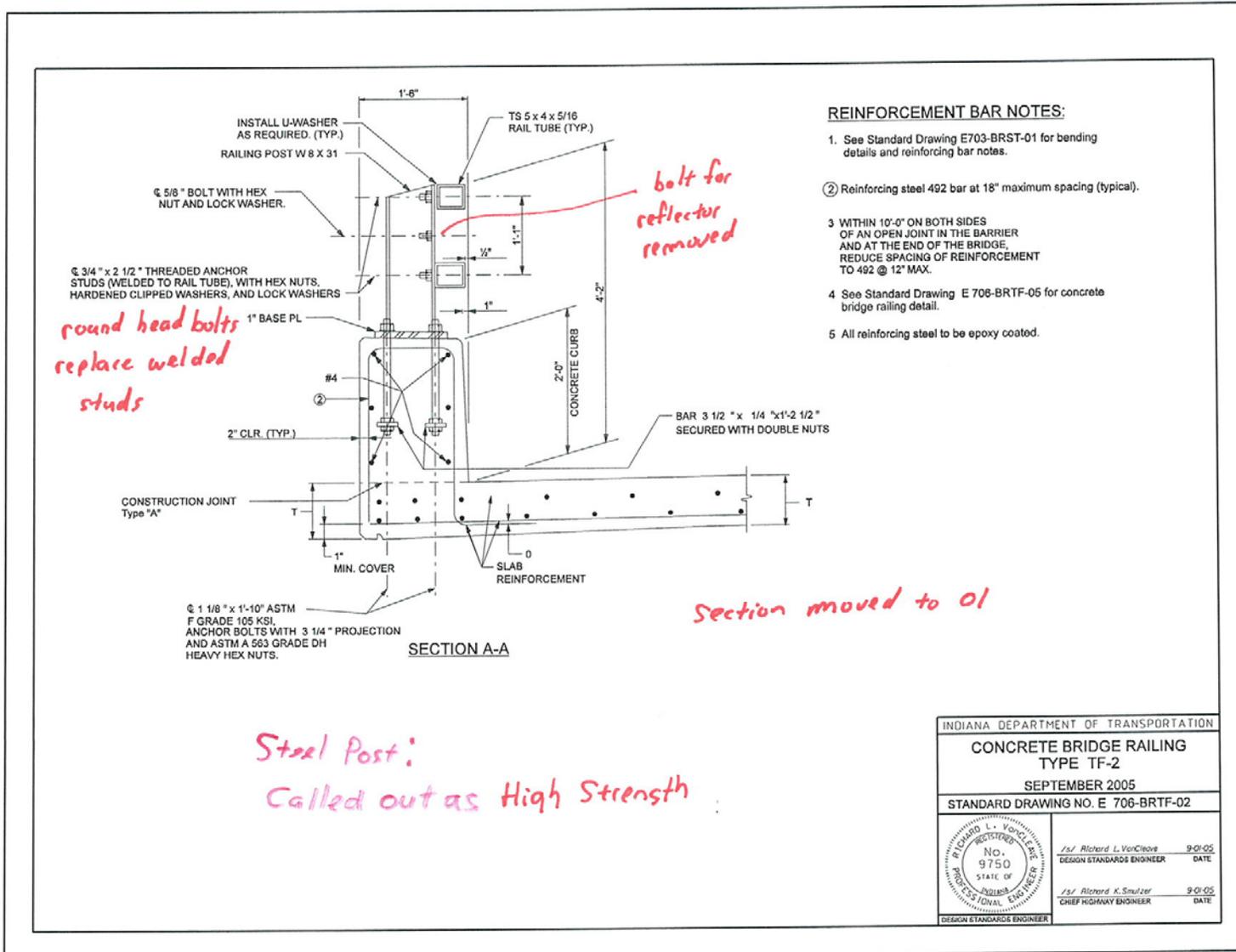
CONCRETE BRIDGE RAILING TYPE TF-2

ELEVATION

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BRIDGE RAILING TYPE TF-2	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 706-BRTF-01	
	<i>/s/ Richard L. VanCleave</i> 9/9/05 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Richard H. Spitzer</i> 9/9/05 CHIEF HIGHWAY ENGINEER DATE

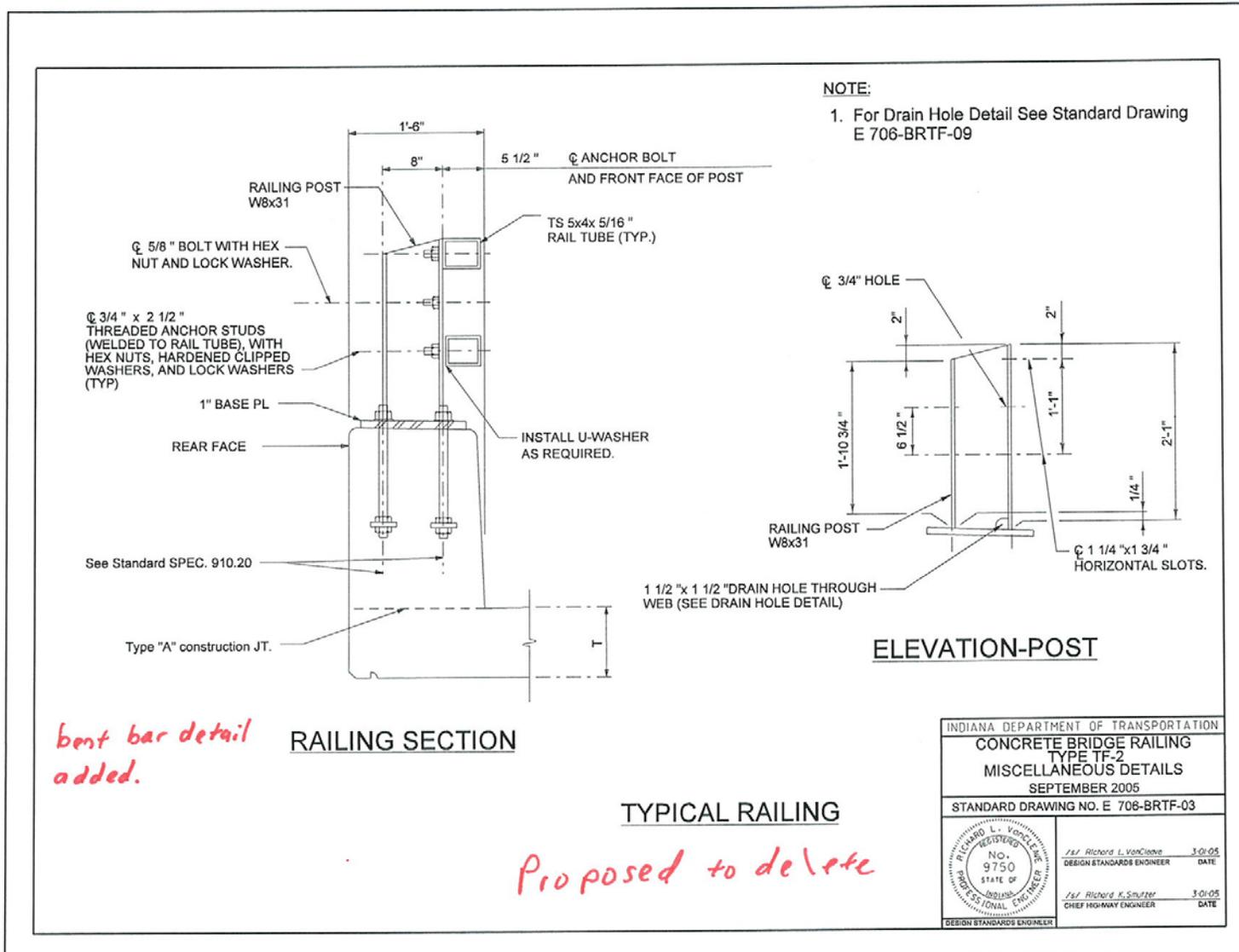
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-02 CONCRETE BRIDGE RAILING TYPE TF-2 (WITH MARKUPS)



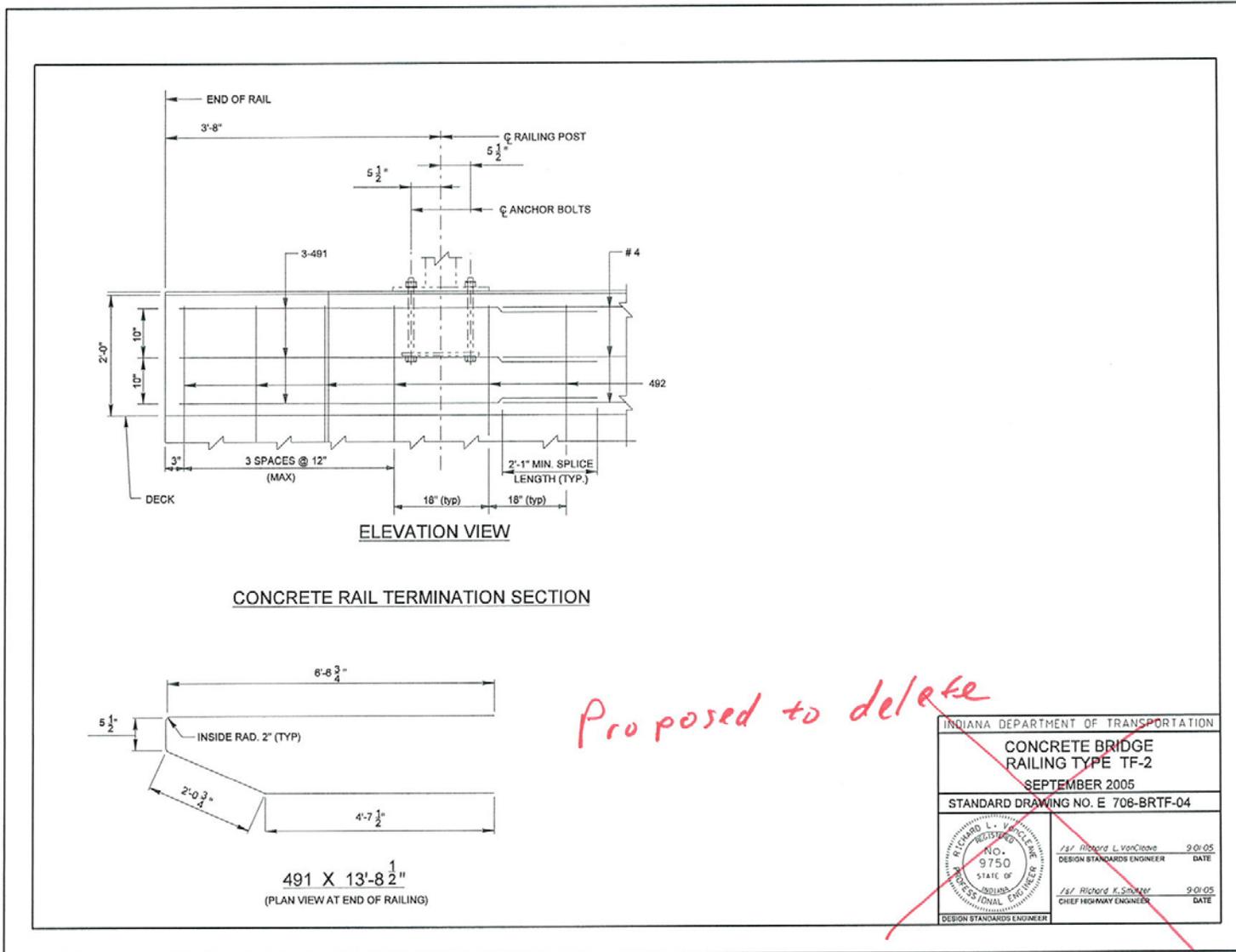
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-03 CONCRETE BRIDGE RAILING TYPE TF-2 MISCELLANEOUS DETAILS (PROPOSED TO DELETE)



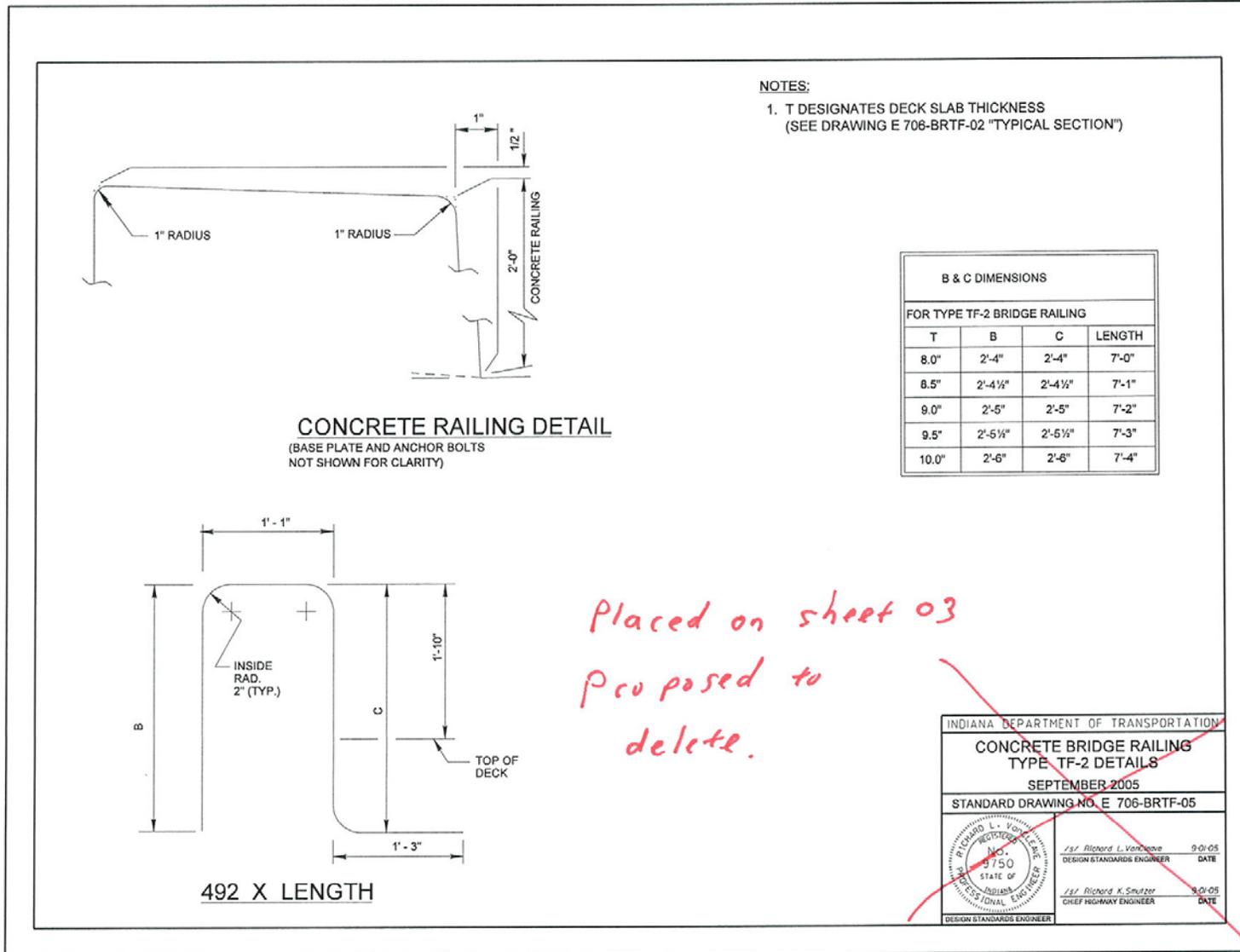
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-04 CONCRETE BRIDGE RAILING TYPE TF-2 (PROPOSED TO DELETE)



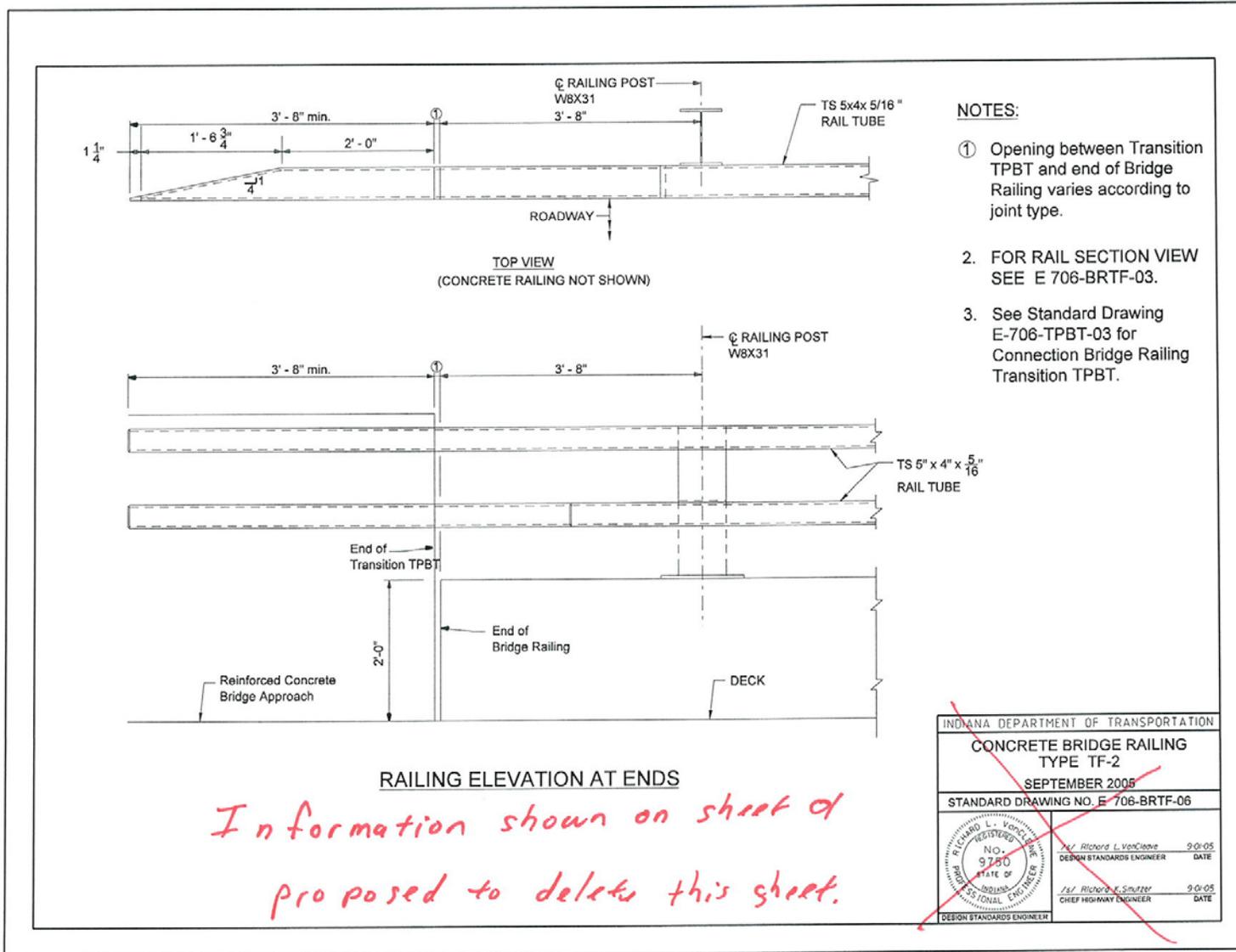
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-05 CONCRETE BRIDGE RAILING TYPE TF-2 DETAILS (PROPOSED TO DELETE)



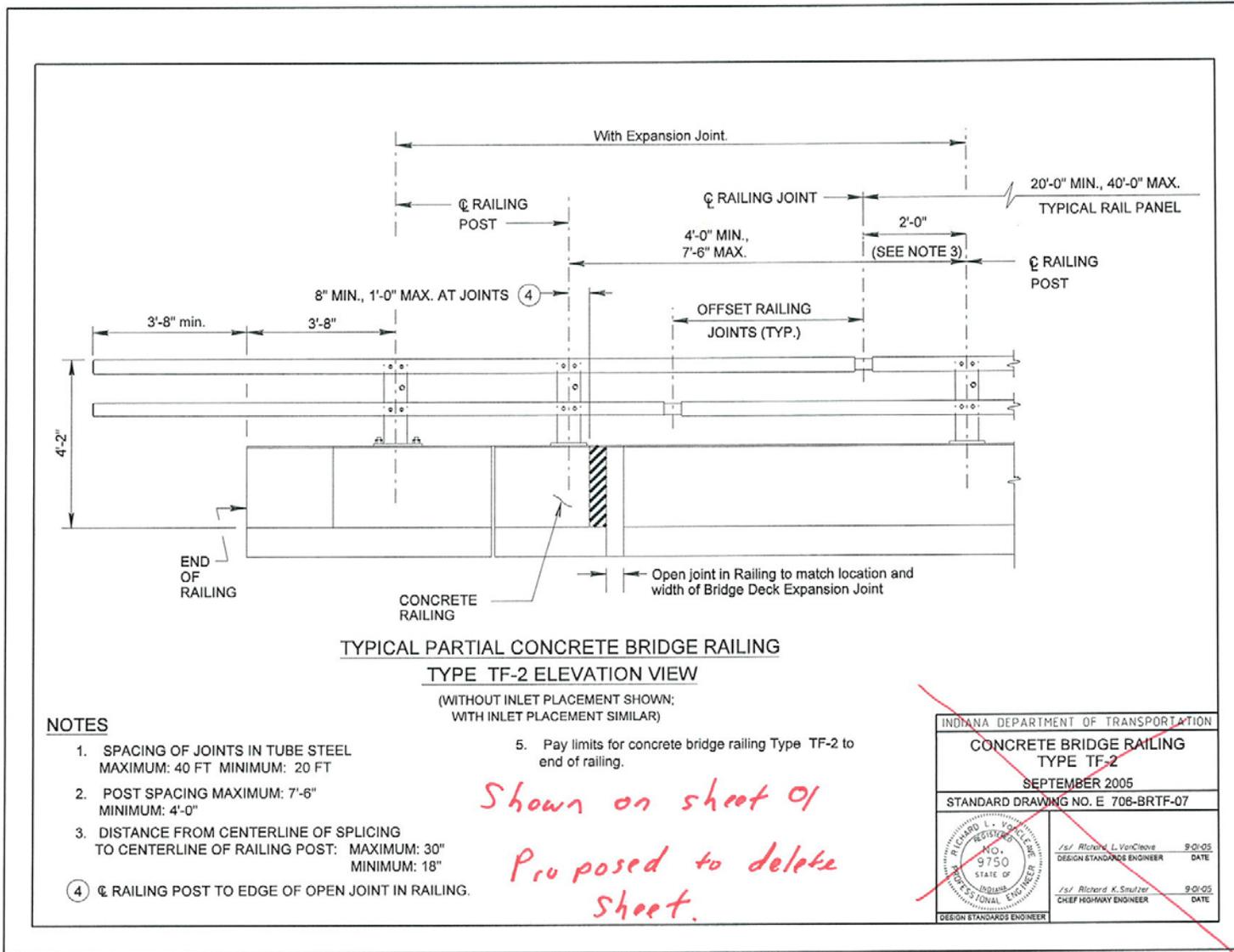
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-06 CONCRETE BRIDGE RAILING TYPE TF-2 (PROPOSED TO DELETE)



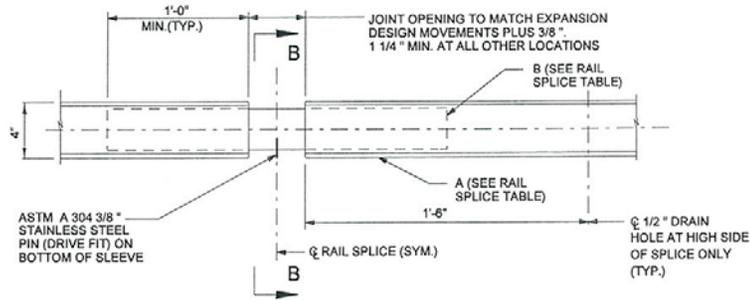
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-07 CONCRETE BRIDGE RAILING TYPE TF-2 (PROPOSED TO DELETE)



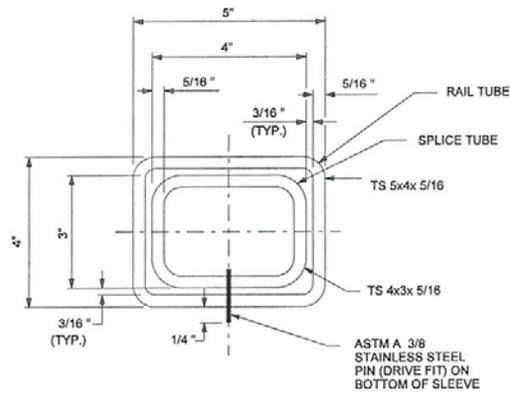
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTF-08 CONCRETE BRIDGE RAILING TYPE TF-2. RAILING SPLICE DETAIL (PROPOSED TO DELETE)



RAIL SPLICE DETAIL
 TS 5x4x 5/16 RAIL SPLICE SHOWN;
 TS 2x2x 1/4 RAIL SPLICE SIMILAR

Shown on sheet 02



SECTION B-B

RAIL SPLICE TABLE	
A (RAIL TUBE)	B (SPLICE TUBE)
TS 5x4x 5/16	TS 4x3x 5/16
TS 2x2x 1/4	1-1/4" x 1 1/4 ROD 36 KSI

INDIANA DEPARTMENT OF TRANSPORTATION
**CONCRETE BRIDGE RAILING TYPE
 TF-2. RAILING SPLICE DETAIL**
 SEPTEMBER 2005
 STANDARD DRAWING NO. E 706-BRTF-08

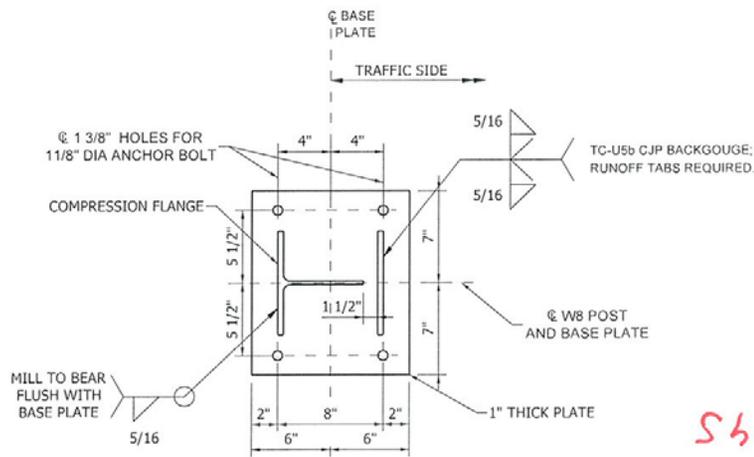
	Richard L. VanCleave DESIGN STANDARDS ENGINEER	9-01-05 DATE
	Richard K. Smutzer CHIEF HIGHWAY ENGINEER	9-01-05 DATE

REVISION TO STANDARD DRAWINGS

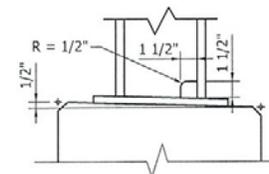
EXISTING 706-BRTF-09 CONCRETE BRIDGE RAILING TYPE TF-2 (PROPOSED TO DELETE)

NOTES:

- 1 3/8" HOLES FOR 1 1/8" ANCHOR BOLT.



POST TO BASE PLATE DETAIL



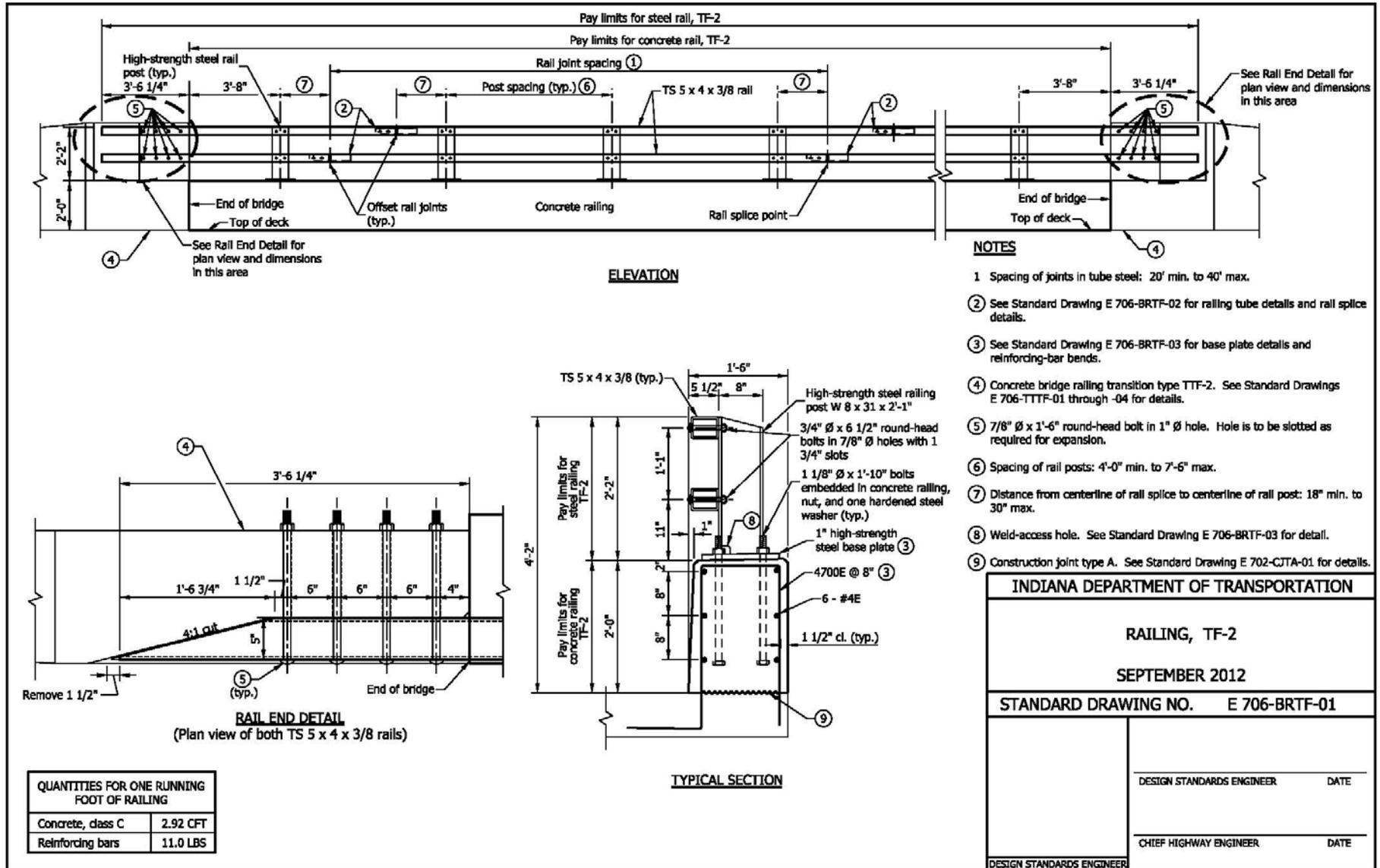
WELD-ACCESS HOLE DETAIL

Shown on sheet 03

INDIANA DEPARTMENT OF TRANSPORTATION	
CONCRETE BRIDGE RAILING TYPE TF-2	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 706-BRTF-09
	/s/ Richard L. VanCleave 09/01/11 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smuizer 09/01/11 CHIEF HIGHWAY ENGINEER DATE

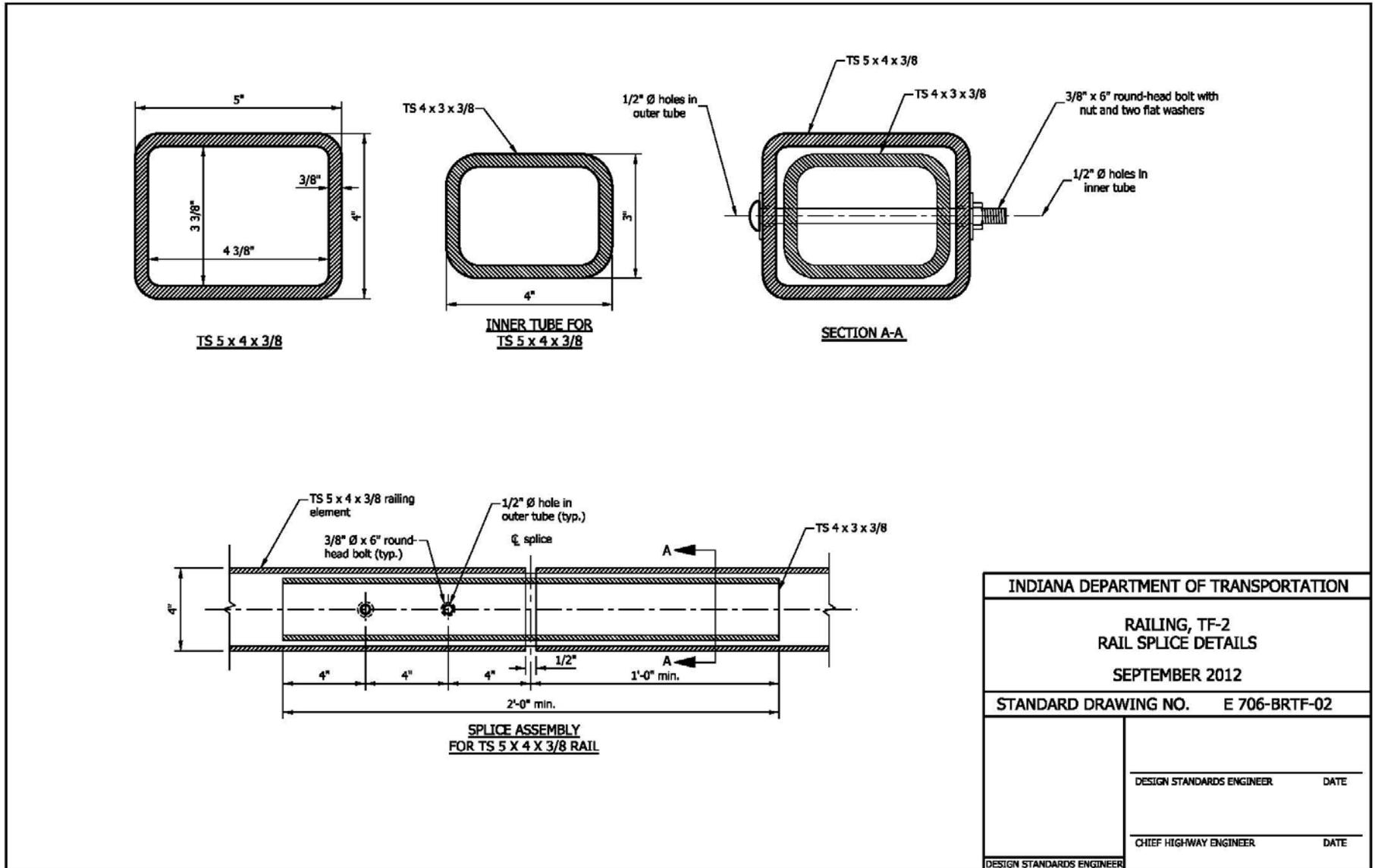
REVISION TO STANDARD DRAWINGS

REVISED 706-BRTF-01 RAILING, TF-2 (DRAFT)



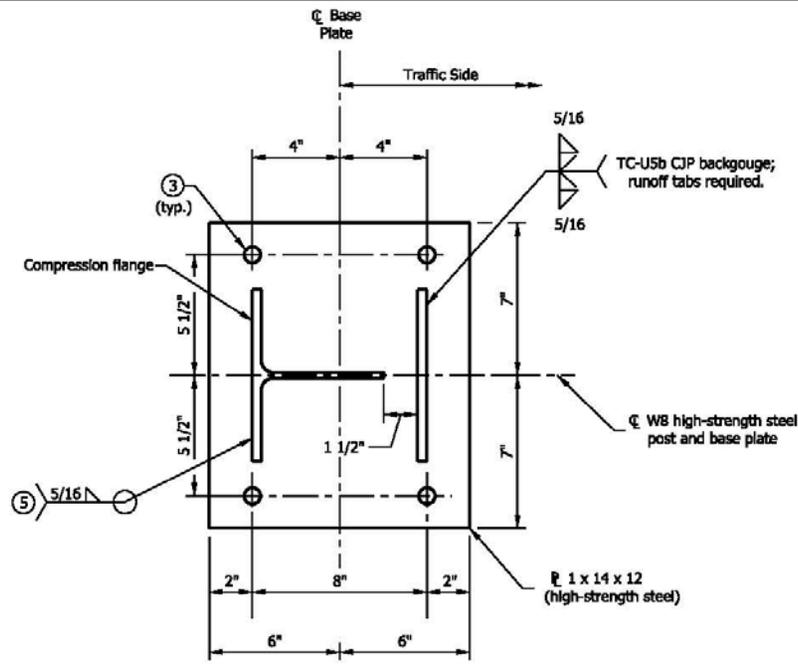
REVISION TO STANDARD DRAWINGS

REVISED 706-BRTF-02 RAILING, TF-2 RAIL SPLICE DETAILS (DRAFT)

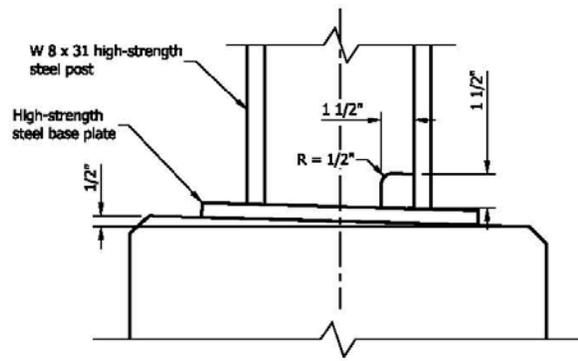


REVISION TO STANDARD DRAWINGS

REVISED 706-BRTF-03 RAILING, TF-2 DETAILS (DRAFT)



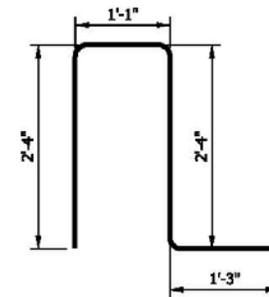
BASE PLATE DETAIL



WELD-ACCESS HOLE DETAIL

NOTES

1. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.
2. All chamfered edges shall be 3/4".
- ③ 1 3/8" \varnothing holes for 1 1/8" anchor bolts.
4. All reinforcing bars designated E shall be epoxy coated.
- ⑤ Mill to bear flush with base plate prior to welding to ensure that the final position of the post is vertical.

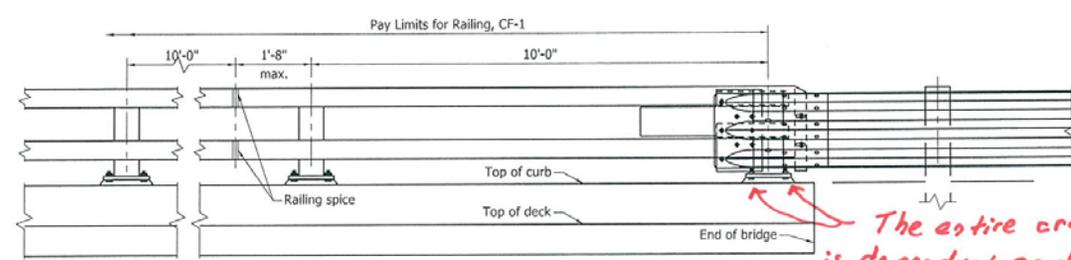
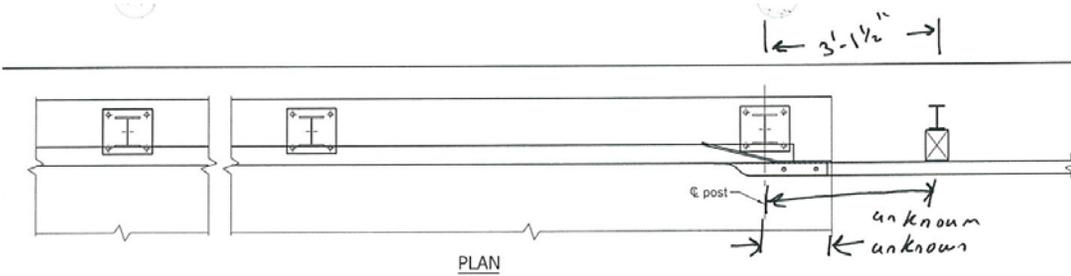


4700E x 7'-0"

INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING, TF-2 DETAILS	
SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRTF-03	
	DESIGN STANDARDS ENGINEER DATE
	CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

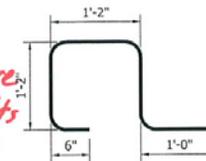
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTM-01 RAILING, CF-1 (PROPOSED TO DELETE)

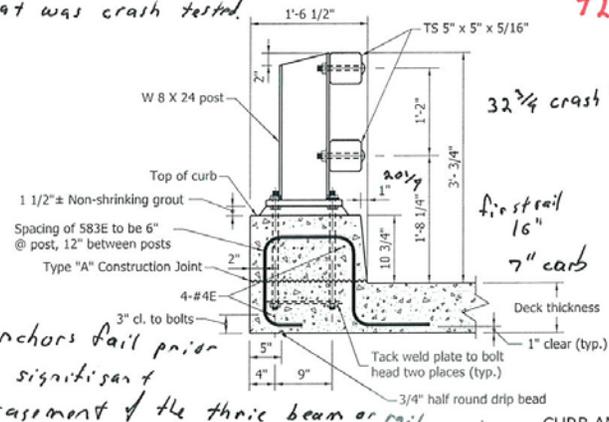


NOTES

1. Guardrail connection may be omitted on exit end of one-way structure when omitted in detail plans.
2. Railing units shall be continuous over 2 or more posts.
3. See Standard Drawing E 706-BRTM-02 for Base Plate details, Anchor Plate details, Railing Splice details and Tube Size details.
4. See Standard Drawing E 601-TBGC-01 and E 601-TBGC-02 for Thrie-Beam components.
5. See Standard Drawing E 703-BRST-01 for standard 180° bar bending detail.
6. See Standard Drawing E 601-TTGT-01 AND E 601-TTGT-02 for Guardrail Transition, TGT.
7. All reinforcing bars designated "E" shall be epoxy coated.



A 36 3/4" rail was not what was crash tested.



The entire crash force is dependant on two bolts on this post. This is a crash tested T1-2 bridge rail - It is proposed that this bridge rail not be a standard.

anchors fail prior to significant engagement of the thrie beam or rail

CURB AND POST DETAILS

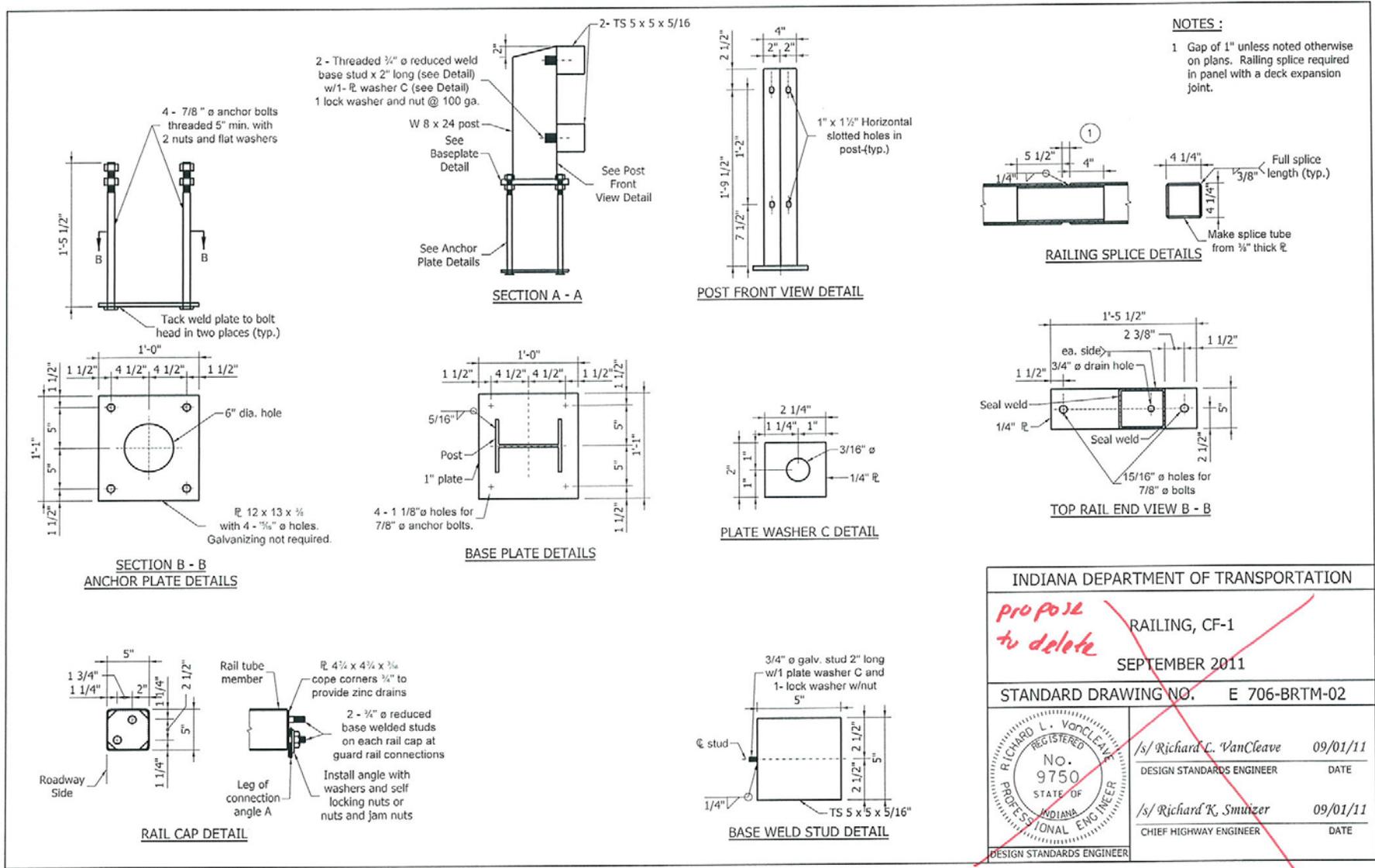
INDIANA DEPARTMENT OF TRANSPORTATION	
Propose to delete	RAILING, CF-1
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 706-BRTM-01
	/s/ Richard L. VanCleave 09/01/11 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 09/01/11 CHIEF HIGHWAY ENGINEER DATE

CF-1

This bridge rail can be used - It is recommended that this bridge rail NOT be a standard. The bridge end seems very unlaerable.

REVISION TO STANDARD DRAWINGS

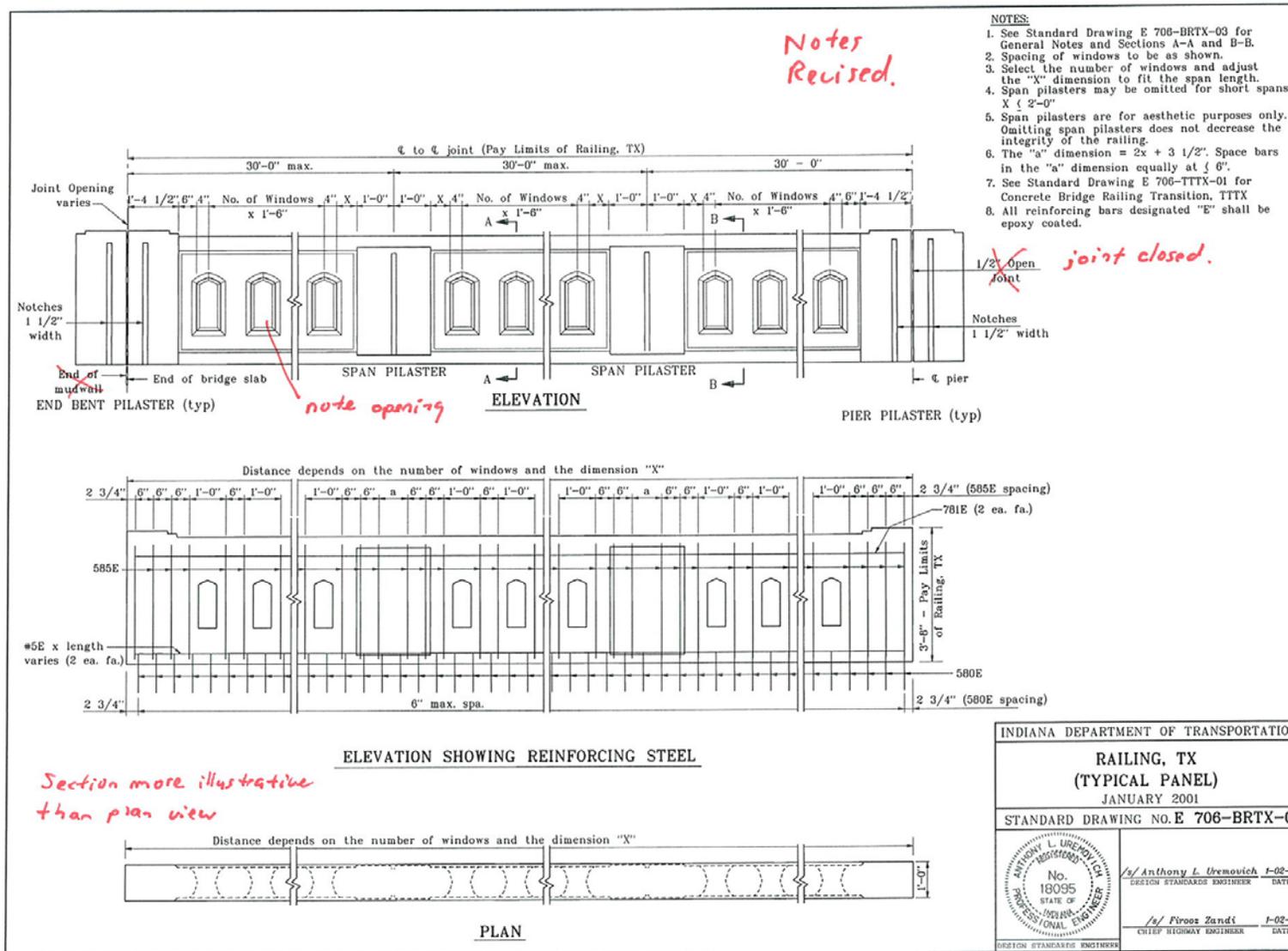
EXISTING 706-BRTM-02 RAILING, CF-1 (PROPOSED TO DELETE)



INDIANA DEPARTMENT OF TRANSPORTATION	
<i>propose to delete</i> RAILING, CF-1	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 706-BRTM-02
	/s/ Richard L. VanCleave 09/01/11 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smuizer 09/01/11 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

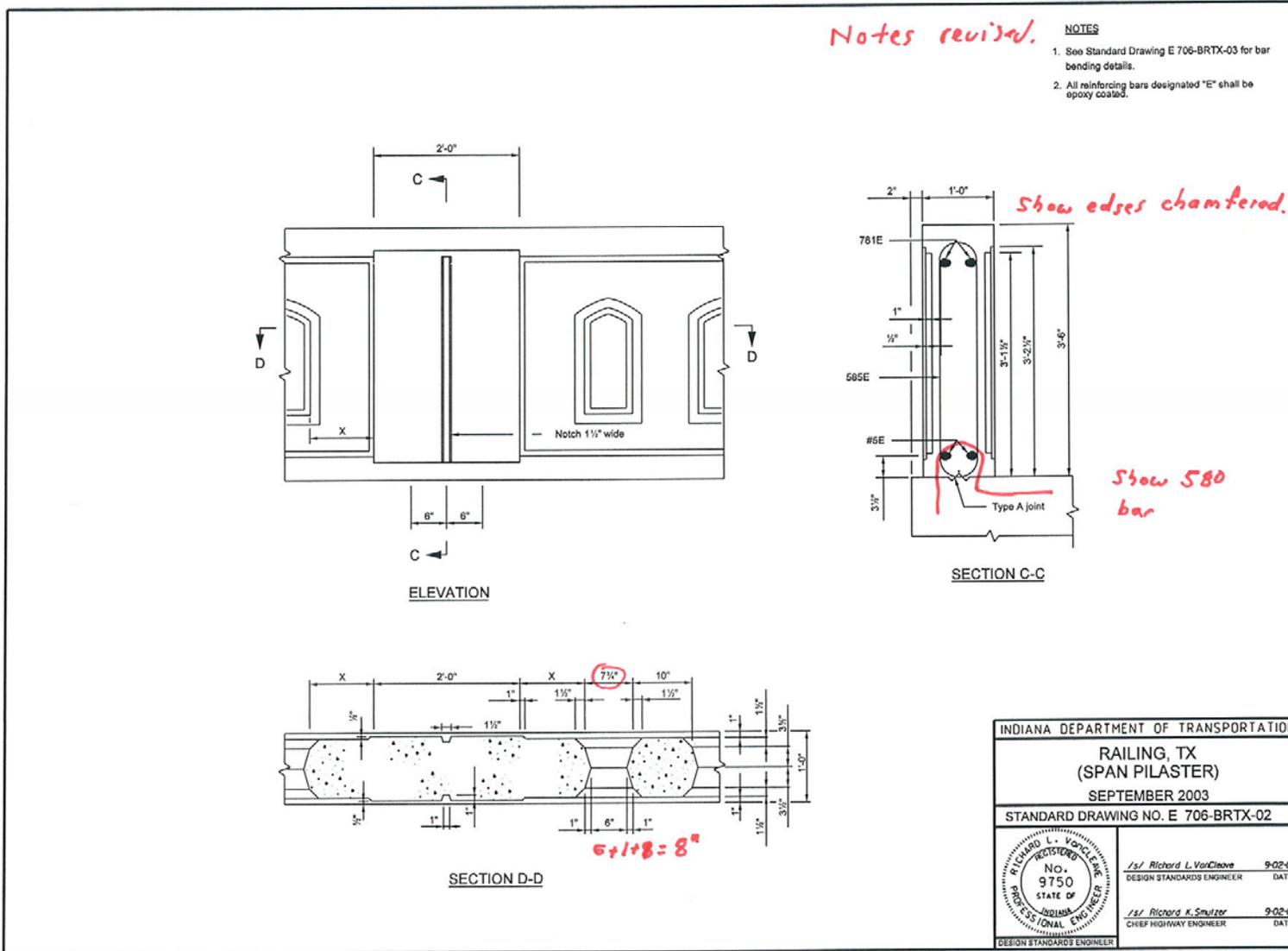
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTX-01 RAILING, TX (TYPICAL PANEL) (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

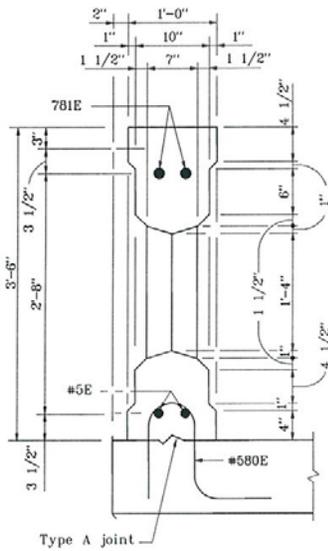
EXISTING 706-BRTX-02 RAILING, TX (SPAN PILASTER) (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

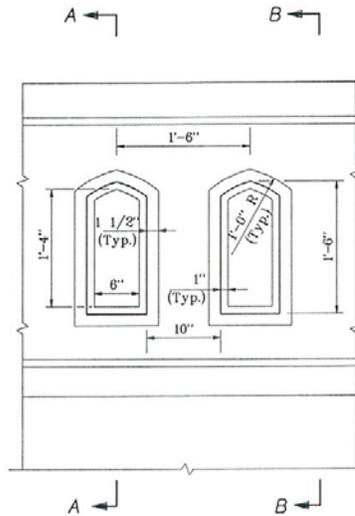
EXISTING 706-BRTX-03 RAILING, TX (WINDOW DETAILS) (WITH MARKUPS)

Shown on sheet 4



SECTION A-A

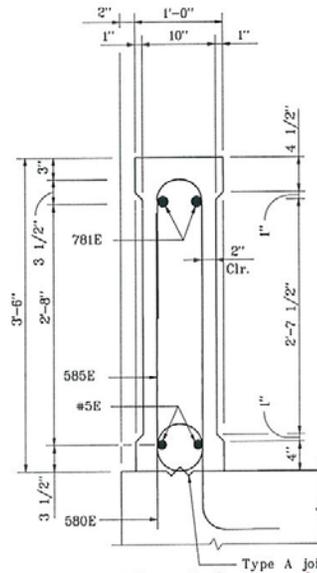
Section added.



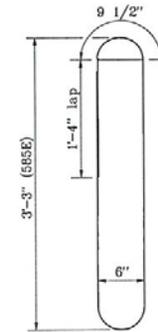
ELEVATION

NOTES

1. All reinforcing bars designated "E" shall be epoxy coated.
2. All chamfered edges shall be 3/4"
- 3) bar bands.

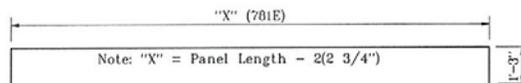


SECTION B-B *Show joint as typical*



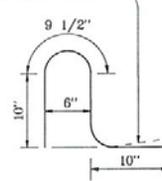
585E x 8'-5"
8'-10"

ben + bars shown on sheet 4



781E x "X" + 2'-6"

Bend as necessary
for metal deck forms



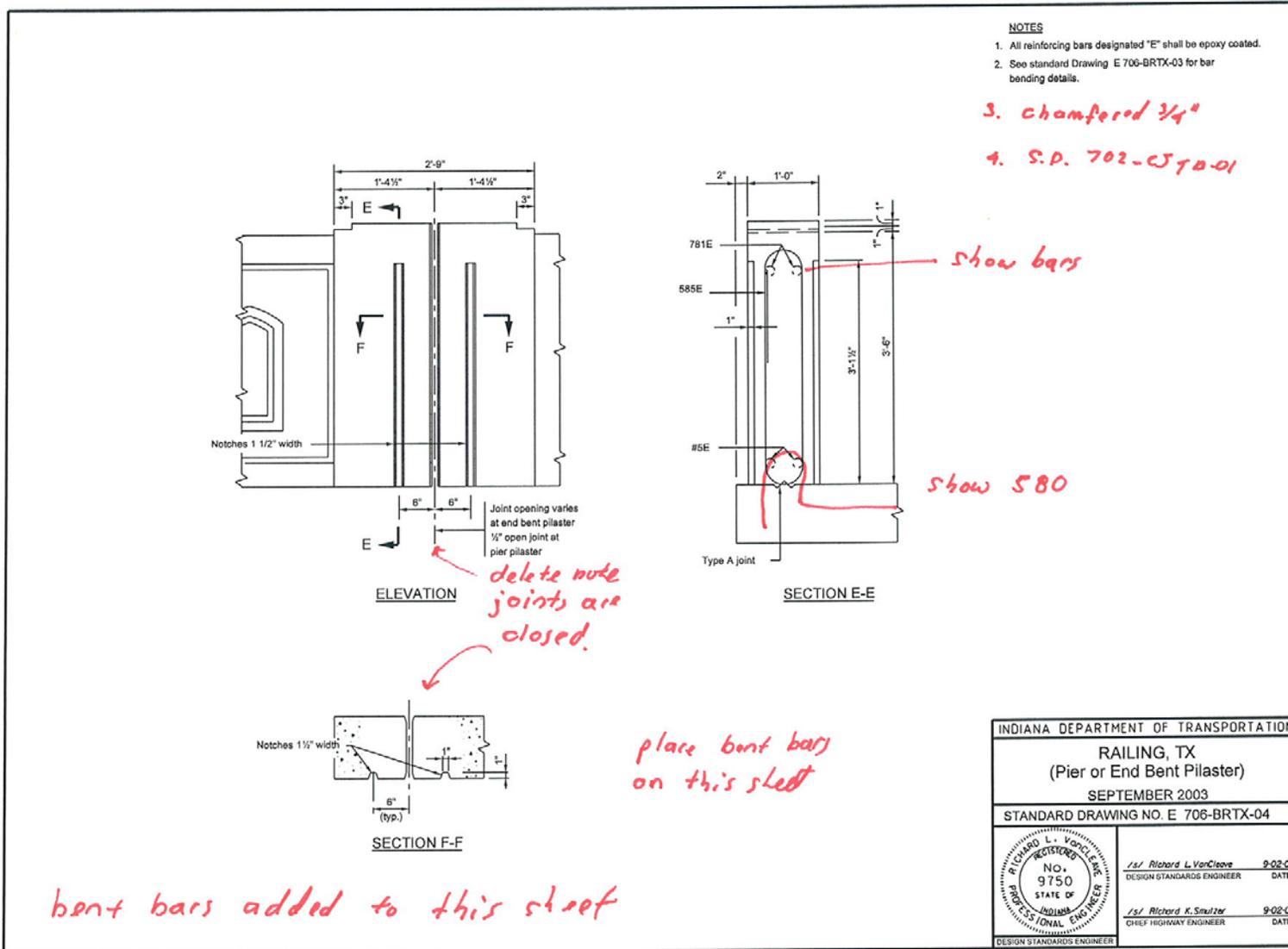
580E x 3'-2"

detail all steel correctly

INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING, TX (WINDOW DETAILS)	
MAY 2000	
STANDARD DRAWING NO.E 706-BRTX-03	
	/s/ Anthony L. Uremovich 5-01-00 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 5-01-00 CHIEF HIGHWAY ENGINEER DATE

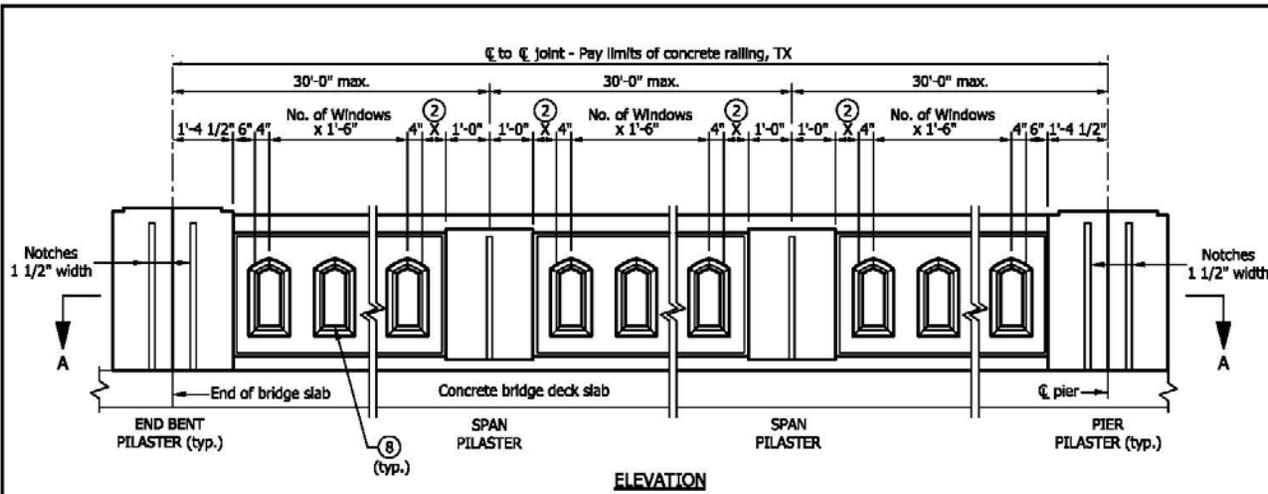
REVISION TO STANDARD DRAWINGS

EXISTING 706-BRTX-04 RAILING, TX (PIER OR END BENT PILASTER) (WITH MARKUPS)



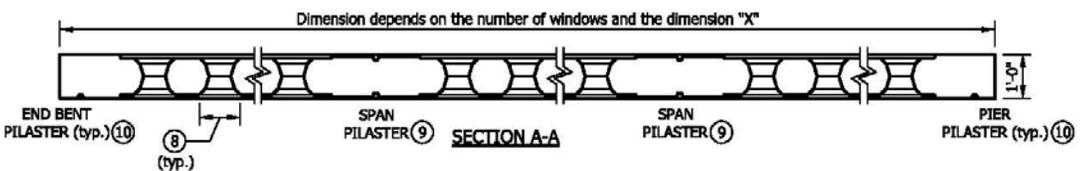
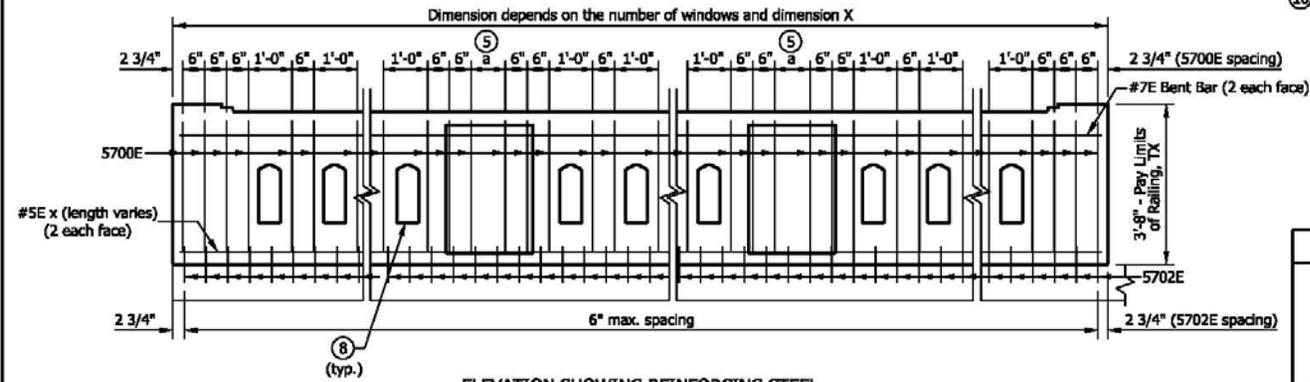
REVISION TO STANDARD DRAWINGS

REVISED 706-BRTX-01 RAILING, TX TYPICAL PANEL (DRAFT)



NOTES

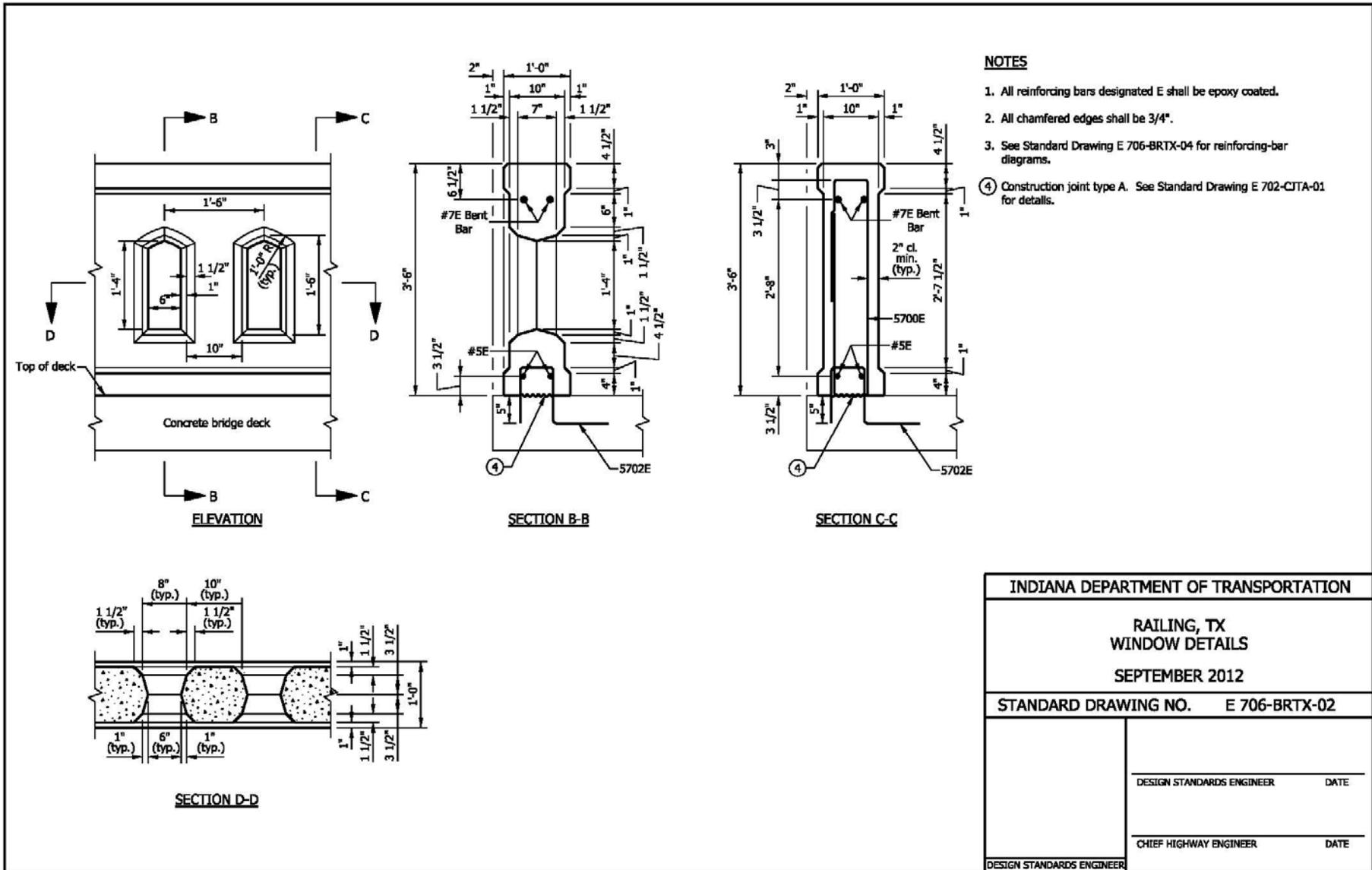
1. See Standard Drawing E 706-BRTX-02, -03, and -04 for sections.
- ② Select the number of windows and adjust dimension X to fit the span length.
3. Span pilasters may be omitted for a short span with $X \leq 2'-0"$.
4. Span pilasters are for aesthetic purposes only. Omitting span pilasters does not decrease the integrity of the railing.
- ⑤ Dimension $a = 2X + 3' 1/2"$. Space bars within dimension a equally $\leq 6"$.
6. See Standard Drawing E 706-TTXX-01 for Concrete Bridge Railing Transition, TTXX.
7. All reinforcing bars designated E shall be epoxy coated.
- ⑧ Window opening. See Standard Drawing E 706-BRTX-02 for details.
- ⑨ See Standard Drawing E 706-BRTX-03 for span pilaster details.
- ⑩ See Standard Drawing E 706-BRTX-04 for pier and end bent pilaster details.



INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING, TX TYPICAL PANEL	
SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRTX-01	
	DESIGN STANDARDS ENGINEER DATE
	CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

REVISED 706-BRTX-02 RAILING, TX WINDOW DETAILS (DRAFT)

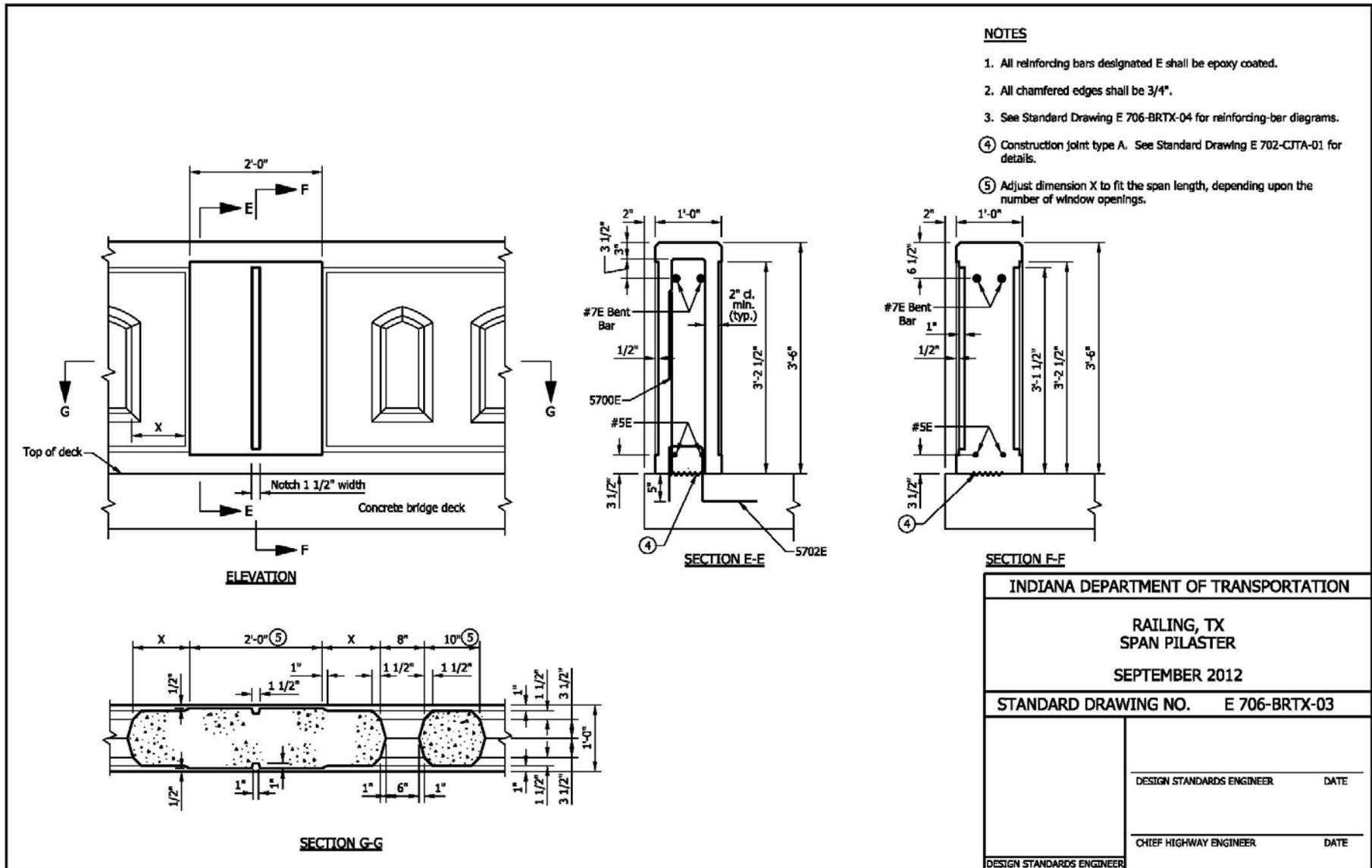


REVISION TO STANDARD DRAWINGS

REVISED 706-BRTX-03 RAILING, TX SPAN PILASTER (DRAFT)

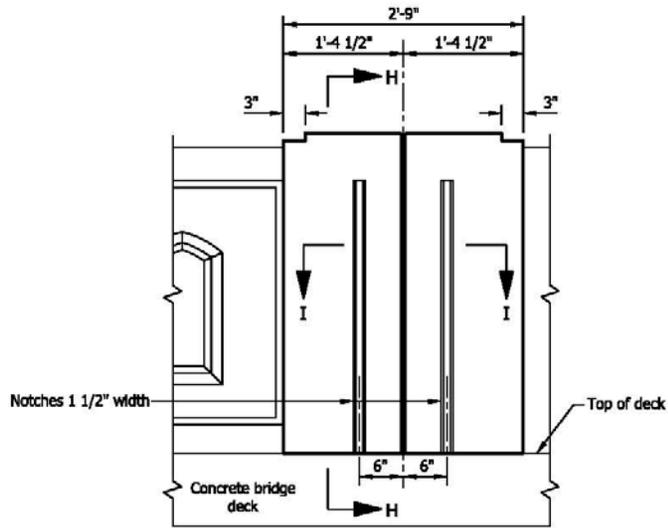
NOTES

1. All reinforcing bars designated E shall be epoxy coated.
2. All chamfered edges shall be 3/4".
3. See Standard Drawing E 706-BRTX-04 for reinforcing-bar diagrams.
- ④ Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.
- ⑤ Adjust dimension X to fit the span length, depending upon the number of window openings.

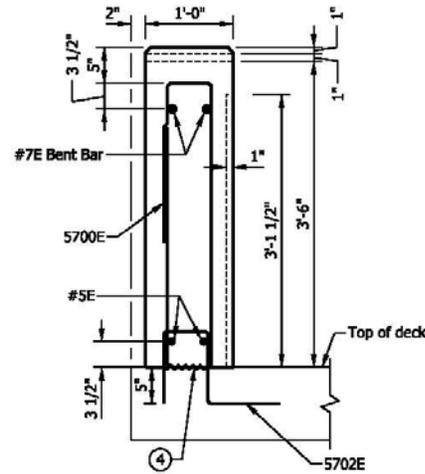


REVISION TO STANDARD DRAWINGS

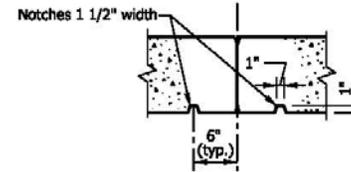
REVISED 706-BRTX-04 RAILING, TX PIER OR END BENT PILASTER (DRAFT)



ELEVATION



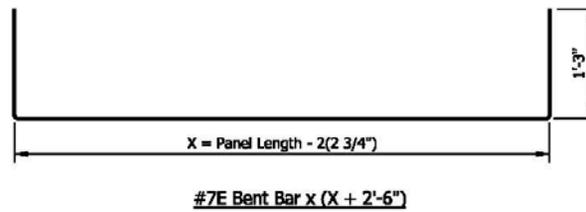
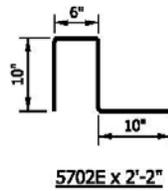
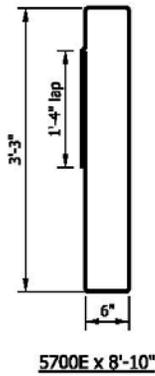
SECTION H-H



SECTION I-I

NOTES

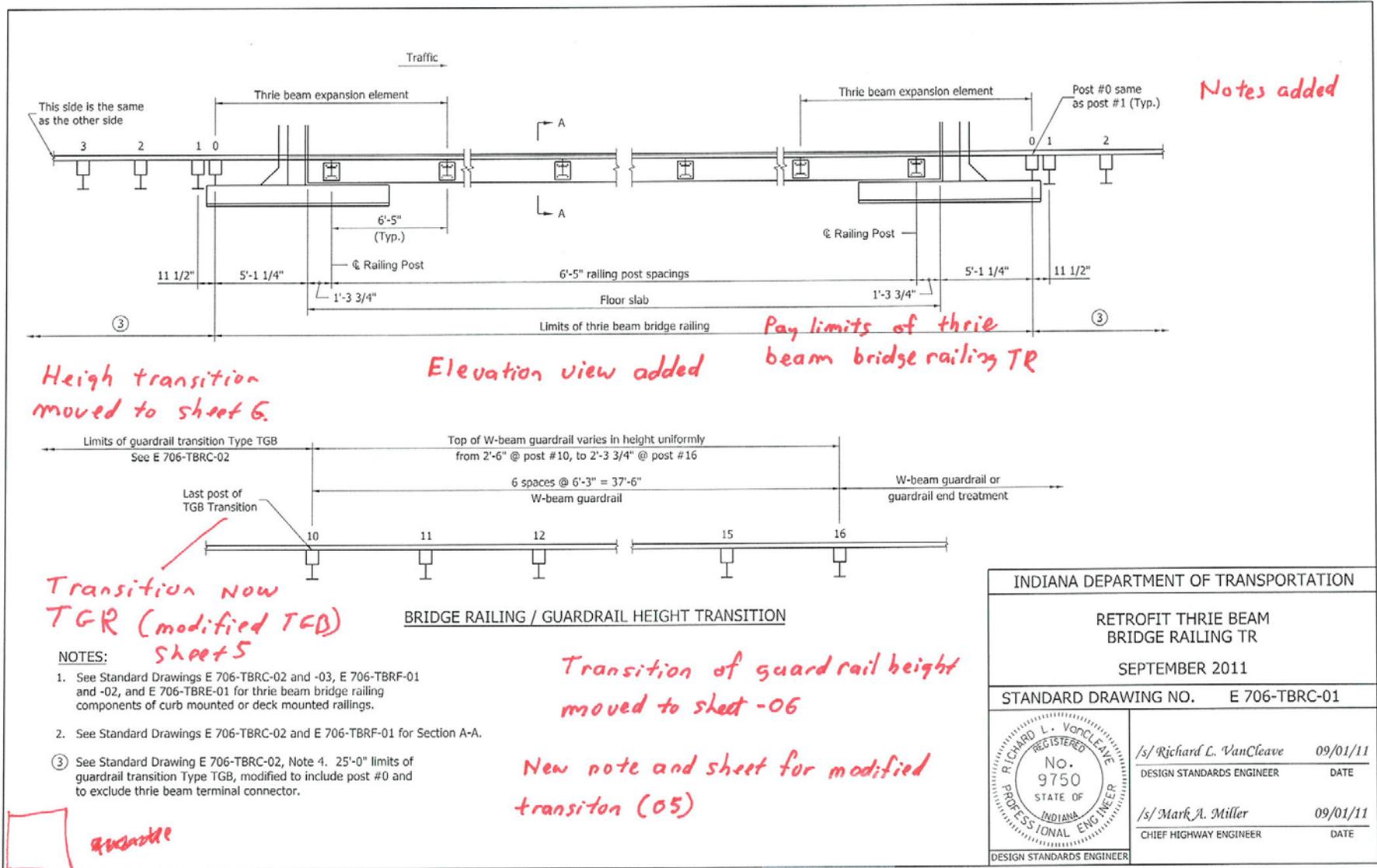
1. All reinforcing bars designated E shall be epoxy coated.
2. See Standard Drawing E 703-BRST-01 for reinforcing-bar bending details and notes.
3. All chamfered edges shall be 3/4".
- ④ Construction joint type A. See Standard Drawing E 702-CJTA-01 for details.



INDIANA DEPARTMENT OF TRANSPORTATION	
RAILING, TX PIER OR END BENT PILASTER	
SEPTEMBER 2012	
STANDARD DRAWING NO.	E 706-BRTX-04
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

EXISTING 706-TBRC-01 RETROFIT THRIE BEAM BRIDGE RAILING TR (WITH MARKUPS)



Heigh transition moved to sheet 6

Elevation view added

Pay limits of thrie beam bridge railing TR

Transition now TGR (modified TGD) sheet 5

Transition of guard rail height moved to sheet -06

New note and sheet for modified transition (05)

quantity

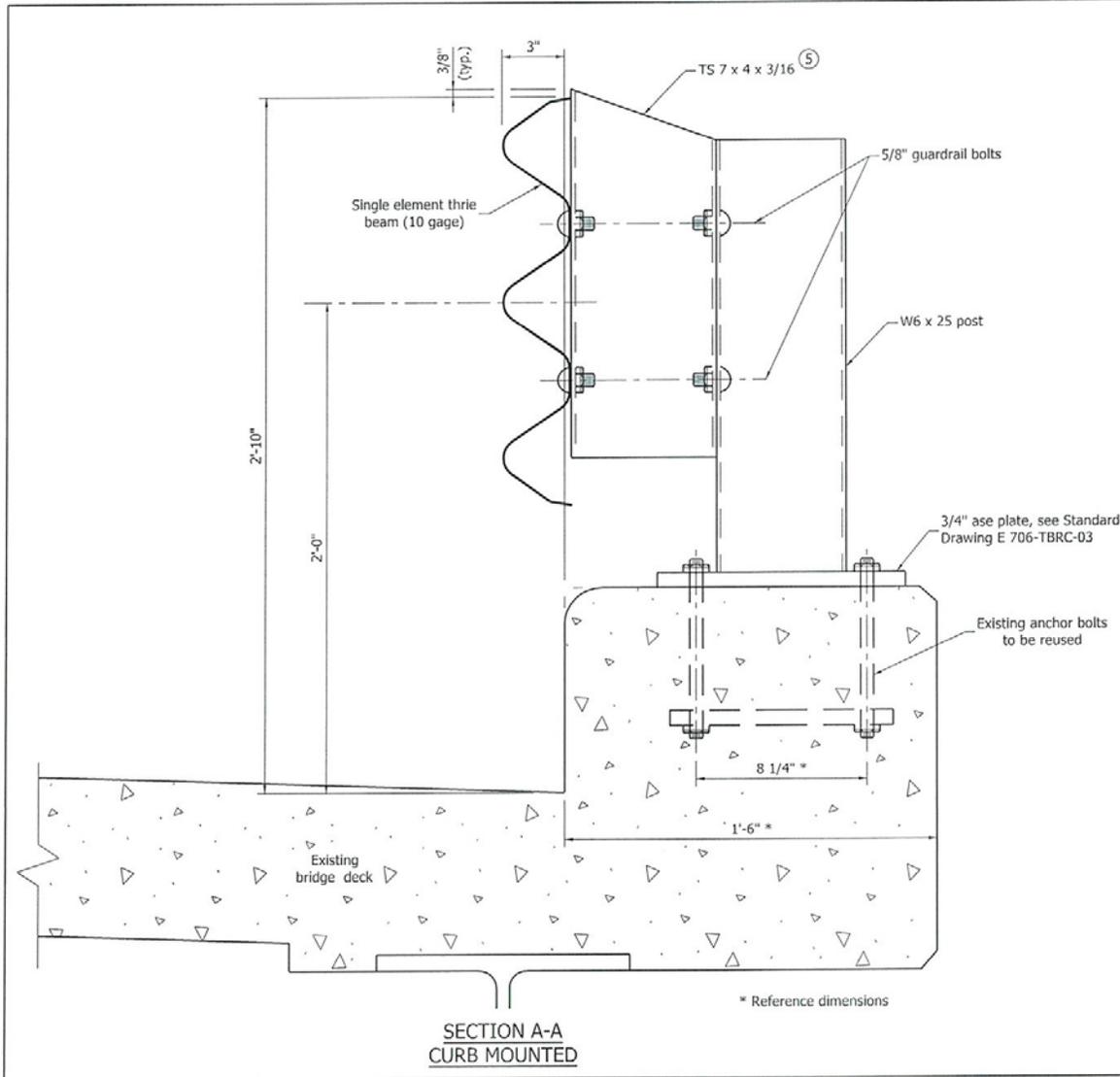
NOTES:

- See Standard Drawings E 706-TBRC-02 and -03, E 706-TBRF-01 and -02, and E 706-TBRE-01 for thrie beam bridge railing components of curb mounted or deck mounted railings.
- See Standard Drawings E 706-TBRC-02 and E 706-TBRF-01 for Section A-A.
- See Standard Drawing E 706-TBRC-02, Note 4. 25'-0" limits of guardrail transition Type TGB, modified to include post #0 and to exclude thrie beam terminal connector.

INDIANA DEPARTMENT OF TRANSPORTATION	
RETROFIT THRIE BEAM BRIDGE RAILING TR	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 706-TBRC-01
	/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-TBRC-02 RETROFIT THRIE BEAM BRIDGE RAILING (WITH MARKUPS)



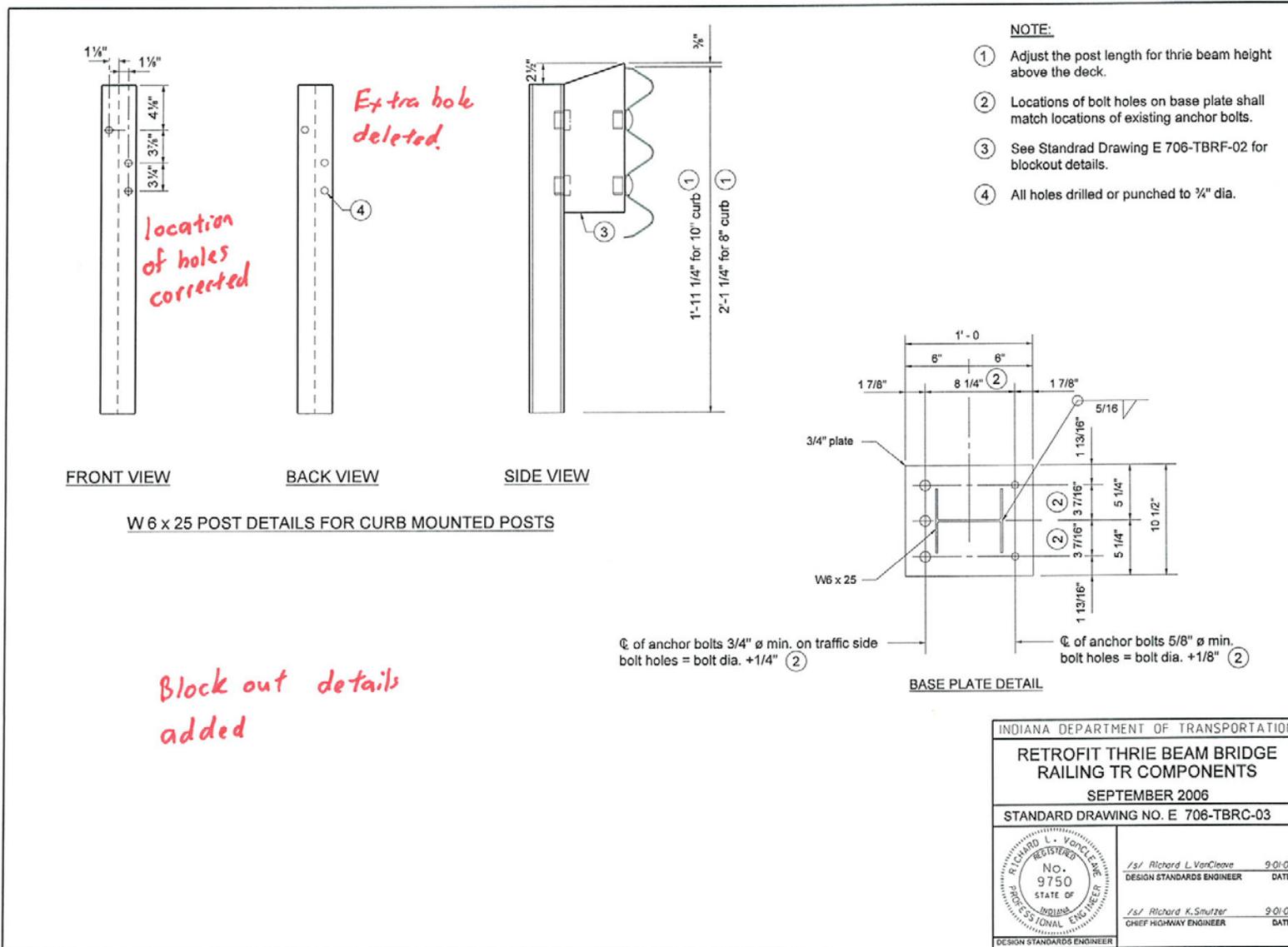
NOTES:

1. See Standard Drawing E 706-TBRC-01 for plan view.
2. See Standard Drawings E 601-TBGC-01 for thrie beam section.
3. See Standard Drawing E 706-TTGB-01, -03, -04 and -05 for type TGB guardrail transition details.
4. Height of type TGB transition post above ground: 1 through 7: 2'-10 3/8"
 Posts 8: 2'-8 3/8"
 Posts 9 & 10: 2'-6 3/8"
 Posts 11 through 16: height varies uniformly. *These notes are shown in drawings*
5. See Standard Drawing E 706-TBRC-03 for post and breakout details.
6. See Standard Drawing E 706-TBRF-01 for deck mounted bridge railing. *deck mounted option deleted.*

INDIANA DEPARTMENT OF TRANSPORTATION	
RETROFIT THRIE BEAM BRIDGE RAILING	
SEPTEMBER 2011	
STANDARD DRAWING NO. E 706-TBRC-02	
	/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	

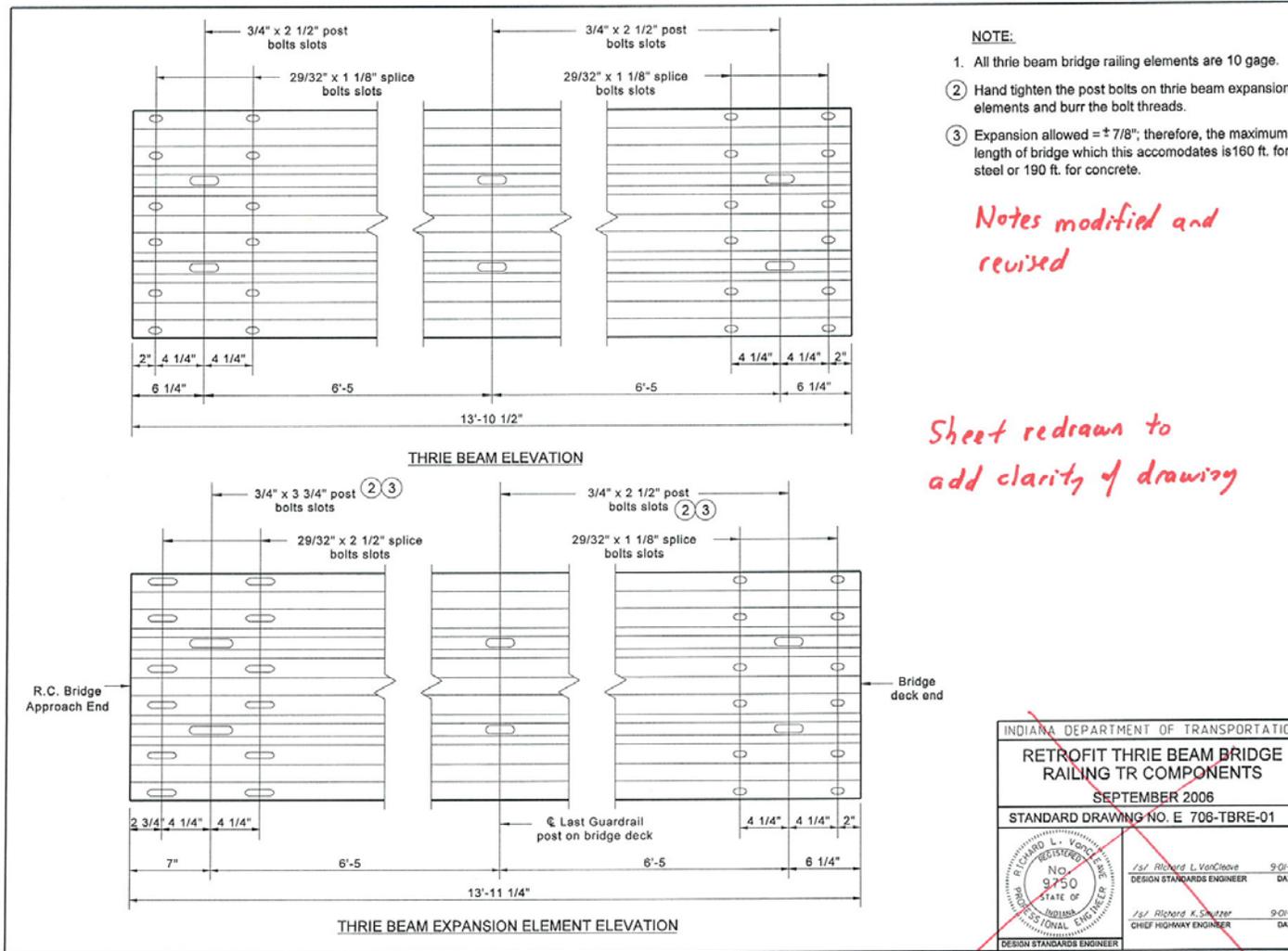
REVISION TO STANDARD DRAWINGS

EXISTING 706-TBRC-03 RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

EXISTING 706-TBRE-01 RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS (WITH MARKUPS)



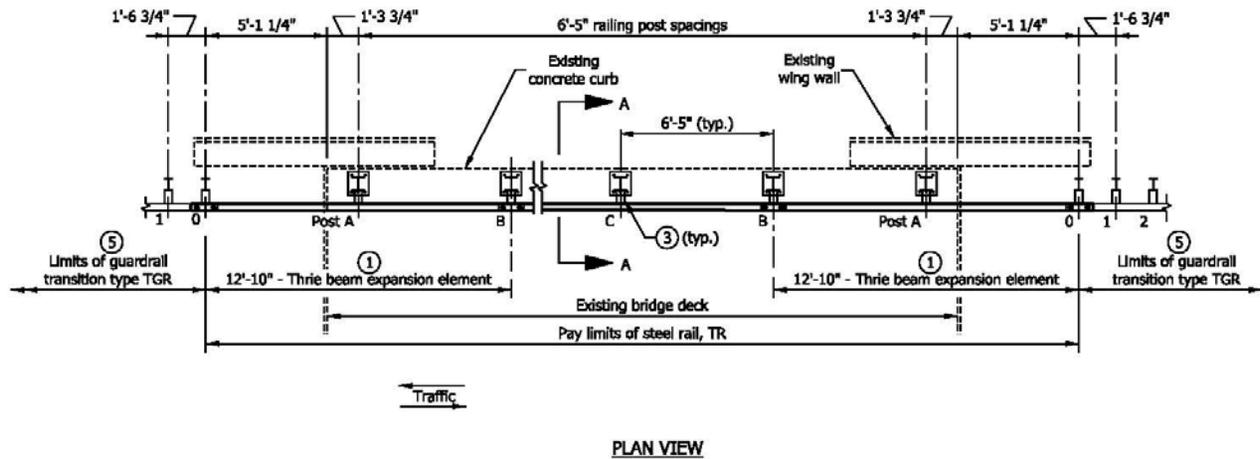
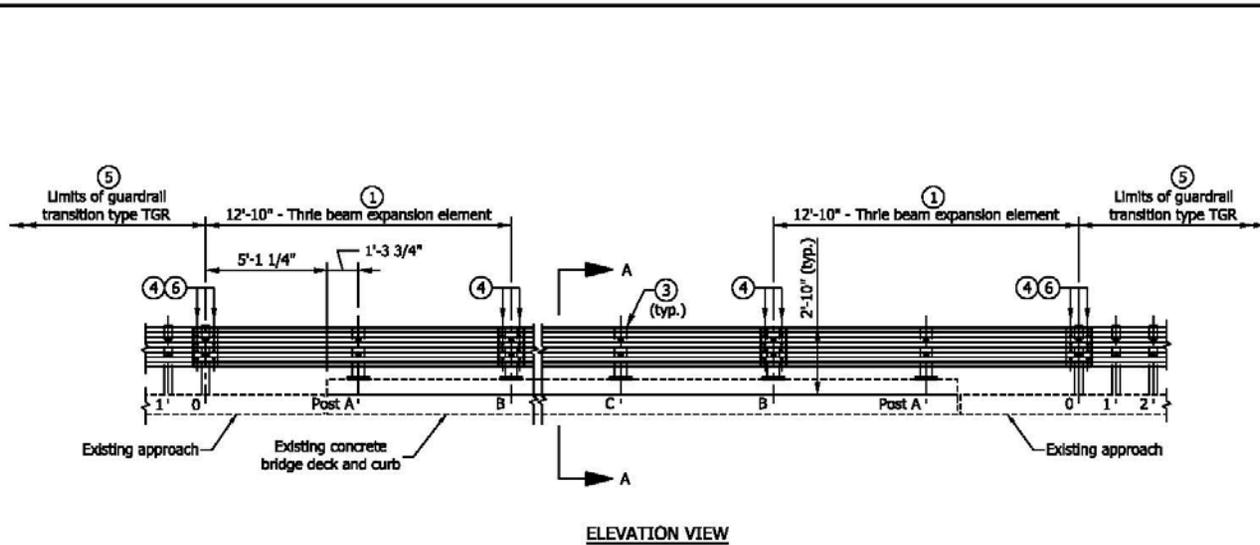
*706-TBRE-01
 Now 706-TBRE-07*

REVISION TO STANDARD DRAWINGS

REVISED 706-~~BRTR~~BRTR-01 RETROFIT THRIE BEAM BRIDGE RAILING TR (DRAFT)

NOTES

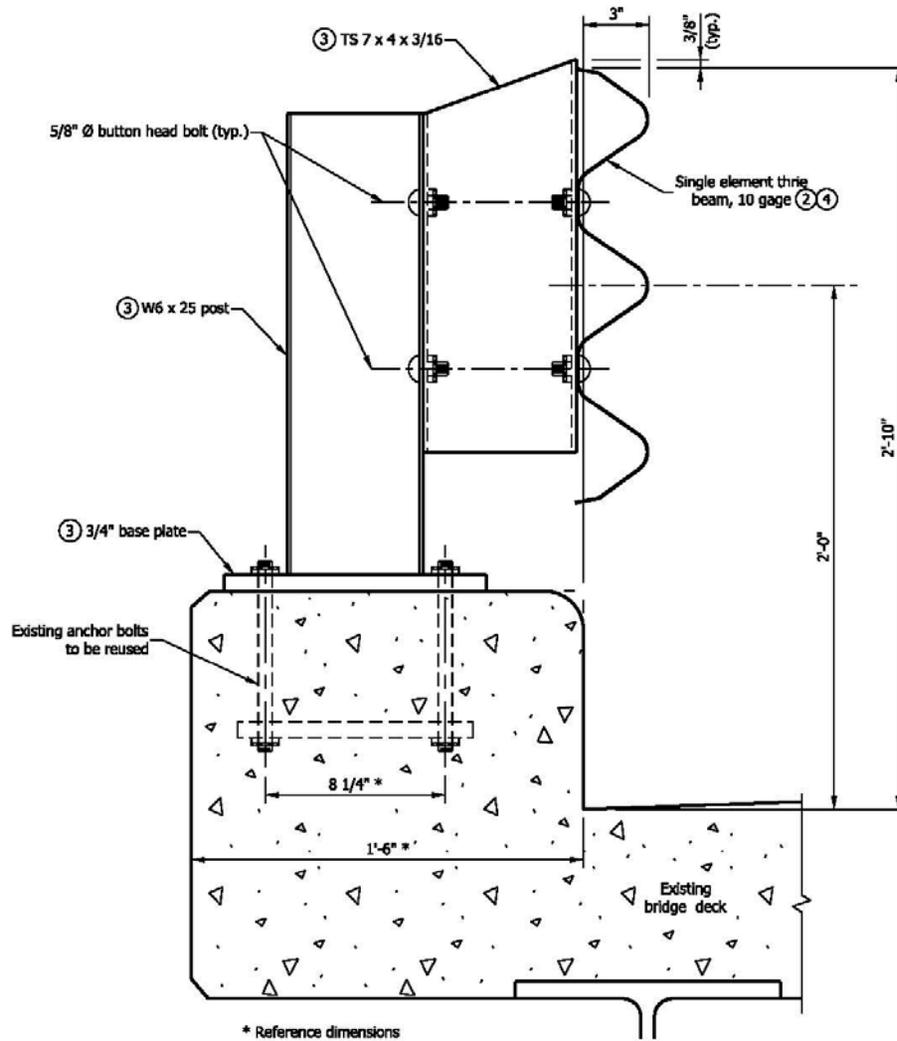
- ① See Standard Drawing E 706-BRTR-04 for thrie beam expansion element.
2. See Standard Drawing E 706-BRTR-02 for Section A-A.
- ③ Bridge railing post/blockout assembly. See Standard Drawing E 706-BRTR-03 for post and blockout details. Attach rail using two 5/8" ϕ x 2" std. button head bolts with rectangular plate washers, round washers, and recess nuts.
- ④ Twelve 5/8" ϕ std. button head bolts with round washers and recess nuts.
- ⑤ See Standard Drawing E 706-BRTR-05 for thrie beam guardrail transition type TGR.
- ⑥ Hand tighten post bolts on thrie beam expansion element and burr bolt threads.



INDIANA DEPARTMENT OF TRANSPORTATION	
RETROFIT THRIE BEAM BRIDGE RAILING TR	
SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRTR-01	
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

REVISED 706-~~TBRC~~BRTR-02 RETROFIT THRIE BEAM BRIDGE RAILING TR (DRAFT)



SECTION A-A

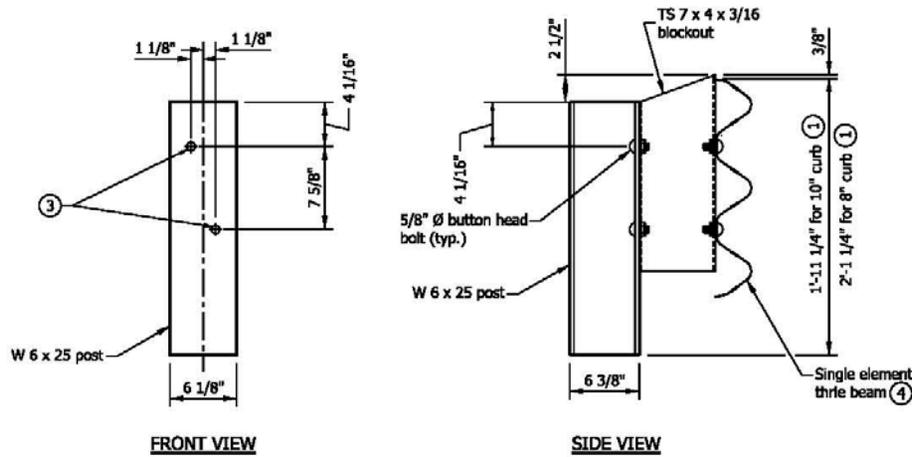
NOTES

1. See Standard Drawing E 706-BRTR-01 for plan view.
2. See Standard Drawing E 601-TBGC-01 for thrie beam section.
3. See Standard Drawing E 706-BRTR-03 for post, blockout, and base plate details.
4. See Standard Drawing E 706-BRTR-04 for thrie beam bridge railing elements.

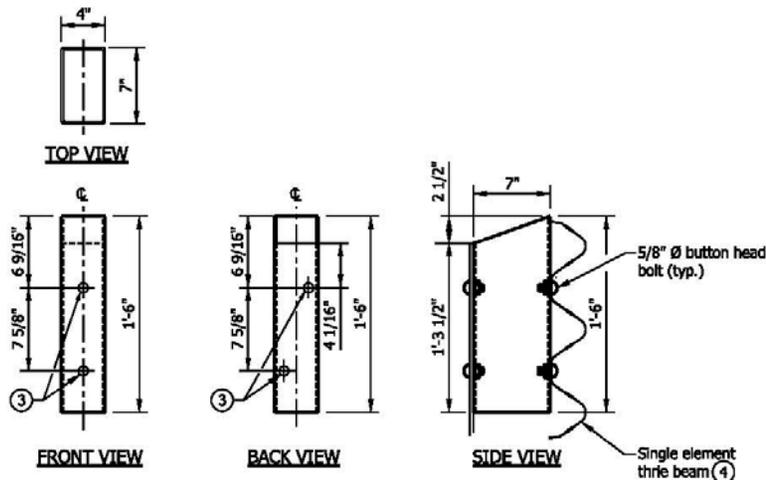
INDIANA DEPARTMENT OF TRANSPORTATION	
RETROFIT THRIE BEAM BRIDGE RAILING TR	
SEPTEMBER 2012	
STANDARD DRAWING NO.	E 706-BRTR-02
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

REVISION TO STANDARD DRAWINGS

REVISED 706-~~TBR~~BRTR-03 RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS (DRAFT)



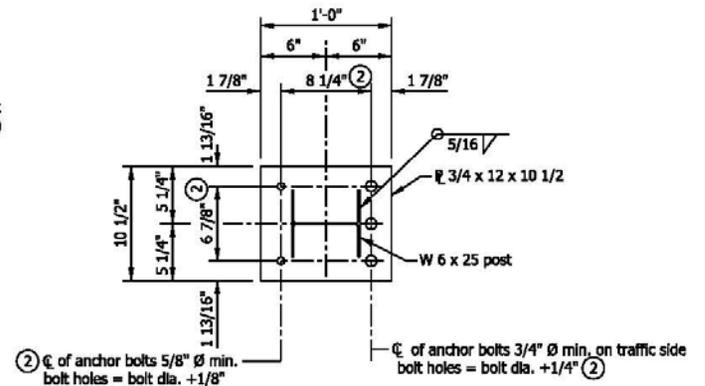
W 6 x 25 POST DETAILS FOR CURB MOUNTED POSTS



TS 7 x 4 x 3/16 BLOCKOUT DETAILS FOR CURB MOUNTED POSTS

NOTES

- ① Adjust the post length for thrie beam height above the deck.
- ② Locations of bolt holes on base plate shall match locations of existing anchor bolts.
- ③ All holes drilled or punched to 3/4" Ø.
- ④ See Standard Drawing E 706-BRTR-04 for thrie beam elements. See Standard Drawing E 601-TBGC-01 for thrie beam rail section.



BASE PLATE DETAIL

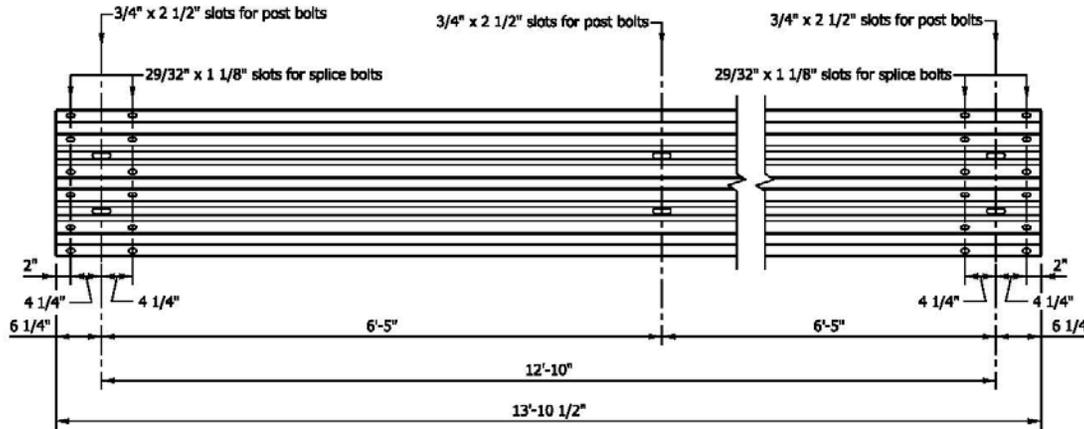
INDIANA DEPARTMENT OF TRANSPORTATION	
RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS SEPTEMBER 2012	
STANDARD DRAWING NO. E 706-BRTR-03	
	DESIGN STANDARDS ENGINEER _____ DATE _____
	CHIEF HIGHWAY ENGINEER _____ DATE _____
DESIGN STANDARDS ENGINEER _____	

REVISION TO STANDARD DRAWINGS

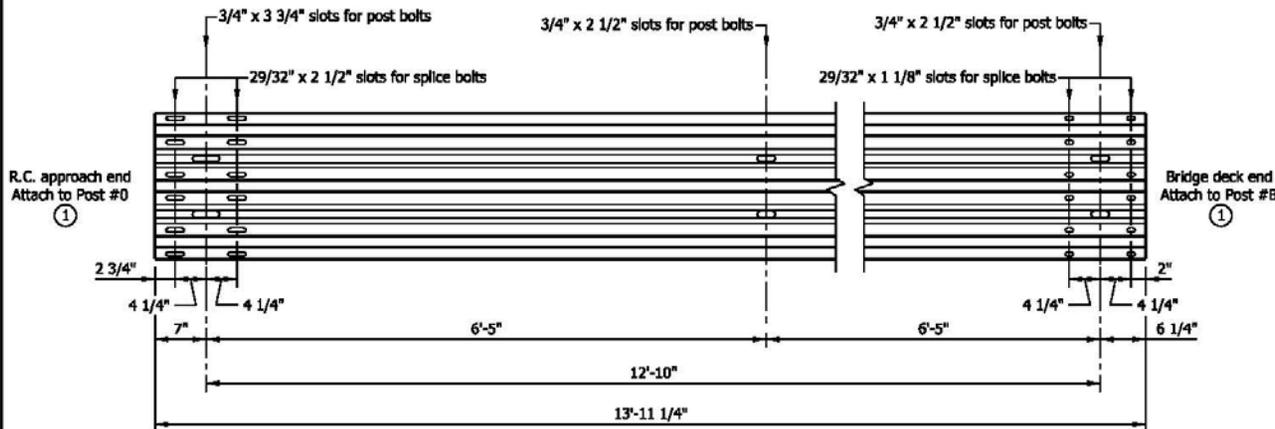
REVISED NEW 706-~~TBR~~BRTR-04 RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS (DRAFT)

NOTES

- ① See Standard Drawing E 706-BRTR-01 for post locations.



THRIE BEAM ELEVATION



THRIE BEAM EXPANSION ELEMENT ELEVATION

INDIANA DEPARTMENT OF TRANSPORTATION

RETROFIT THRIE BEAM
BRIDGE RAILING TR
COMPONENTS
SEPTEMBER 2012

STANDARD DRAWING NO. E 706-BRTR-04

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

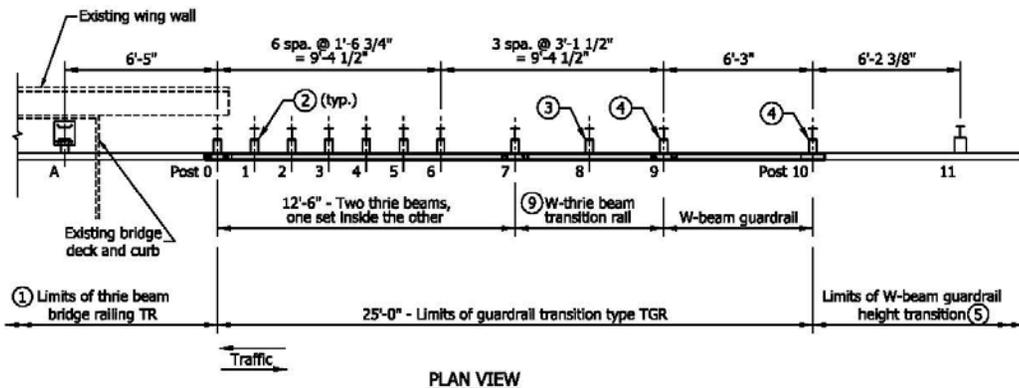
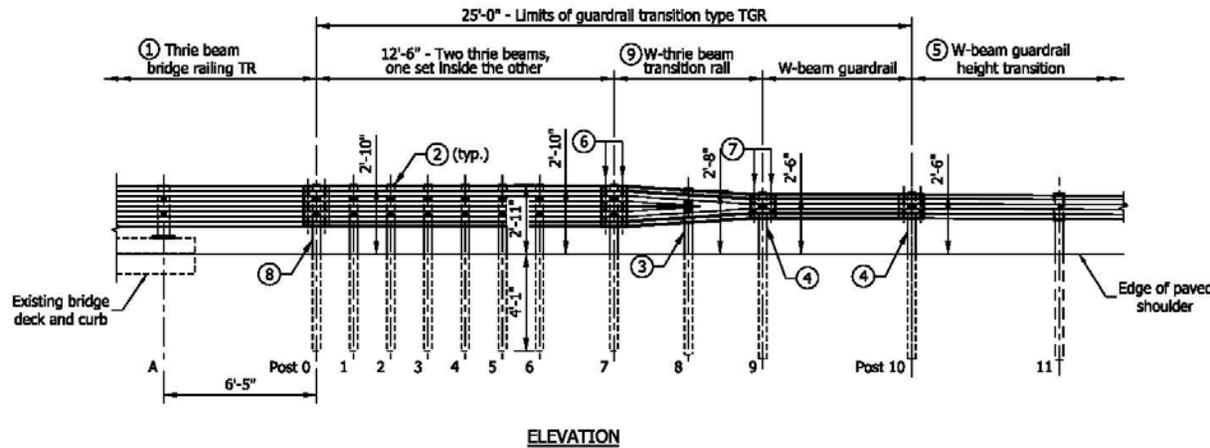
DESIGN STANDARDS ENGINEER

REVISION TO STANDARD DRAWINGS

REVISED NEW 706-~~TBR~~BRTR-05 RETROFIT THRIE BEAM GUARDRAIL TRANSITION TYPE TGR (DRAFT)

NOTES

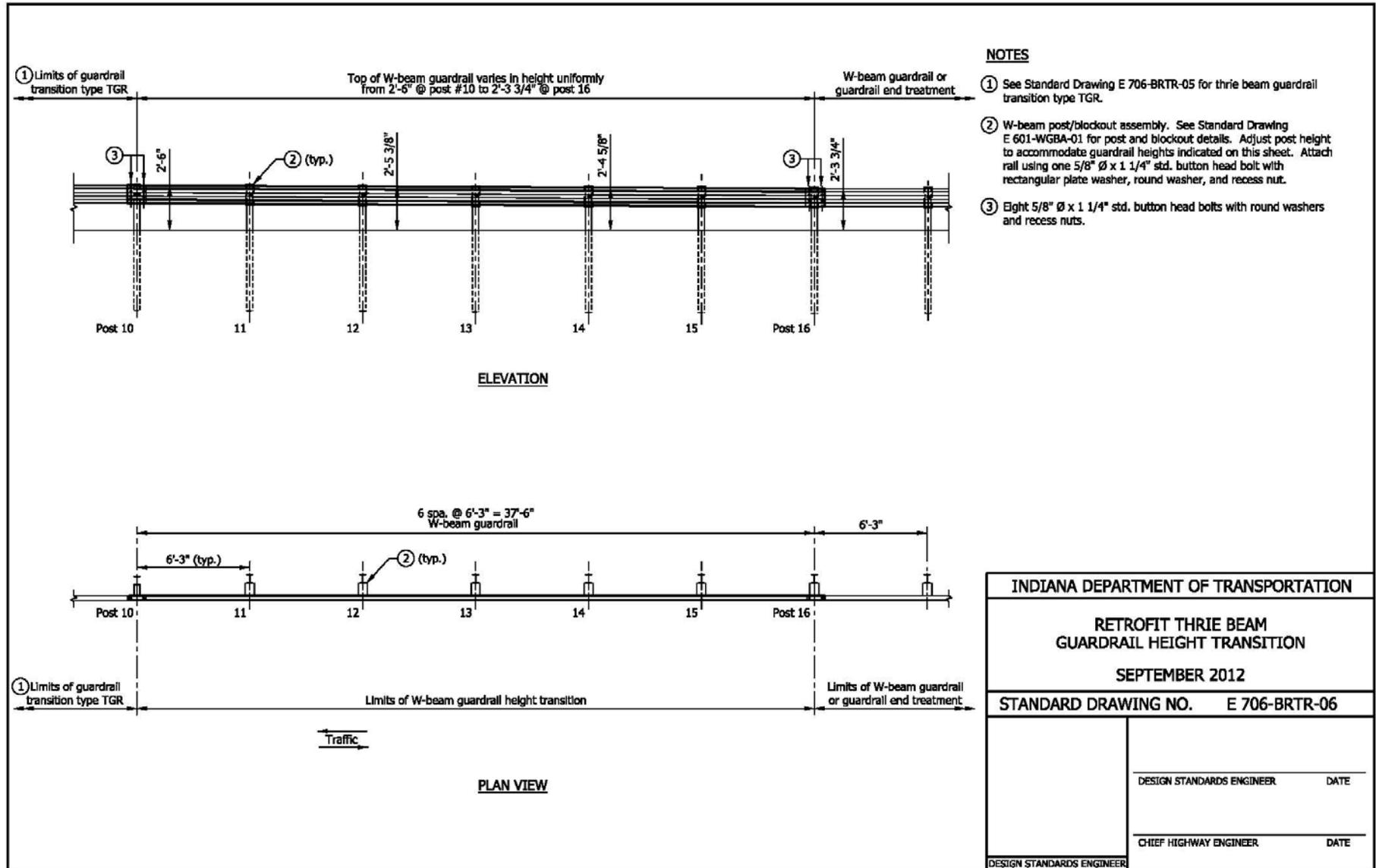
- ① See Standard Drawing E 706-BRTR-01 for thrie beam bridge railing TR.
- ② TGB transition post/blockout assembly. See Standard Drawing E 601-TTGB-03 for post and blockout details. Adjust post height to accommodate guardrail heights indicated on this sheet. Attach rail using two 5/8" \varnothing x 2" std. button head bolts with rectangular plate washers, round washers, and recess nuts.
- ③ W-thrie beam transition post/blockout assembly. See Standard Drawing E 601-TTGB-04 for post and blockout details. Adjust post height to accommodate guardrail heights indicated on this sheet. Attach rail using two 5/8" \varnothing x 2" std. button head bolts with rectangular plate washers, round washers, and recess nuts.
- ④ W-beam post/blockout assembly. See Standard Drawing E 601-TTGB-05 for post and blockout details. Adjust post height to accommodate guardrail heights indicated on this sheet. Attach rail using one 5/8" \varnothing x 1 1/4" std. button head bolt with rectangular plate washer, round washer, and recess nut.
- ⑤ See Standard Drawing E 706-BRTR-06 for W-beam guardrail height transition.
- ⑥ Twelve 5/8" \varnothing x 2" std. button head bolts with round washers and recess nuts, through rail sections.
- ⑦ Eight 5/8" \varnothing x 1 1/4" std. button head bolts with round washers and recess nuts.
- ⑧ Hand tighten post bolts on thrie beam expansion element and burr bolt threads.
- ⑨ See Standard Drawing E 601-TBGC-01 for W-thrie beam transition rail.



INDIANA DEPARTMENT OF TRANSPORTATION	
RETROFIT THRIE BEAM GUARDRAIL TRANSITION TYPE TGR	
SEPTEMBER 2012	
STANDARD DRAWING NO.	E 706-BRTR-05
DESIGN STANDARDS ENGINEER	DATE
CHIEF HIGHWAY ENGINEER	DATE
DESIGN STANDARDS ENGINEER	

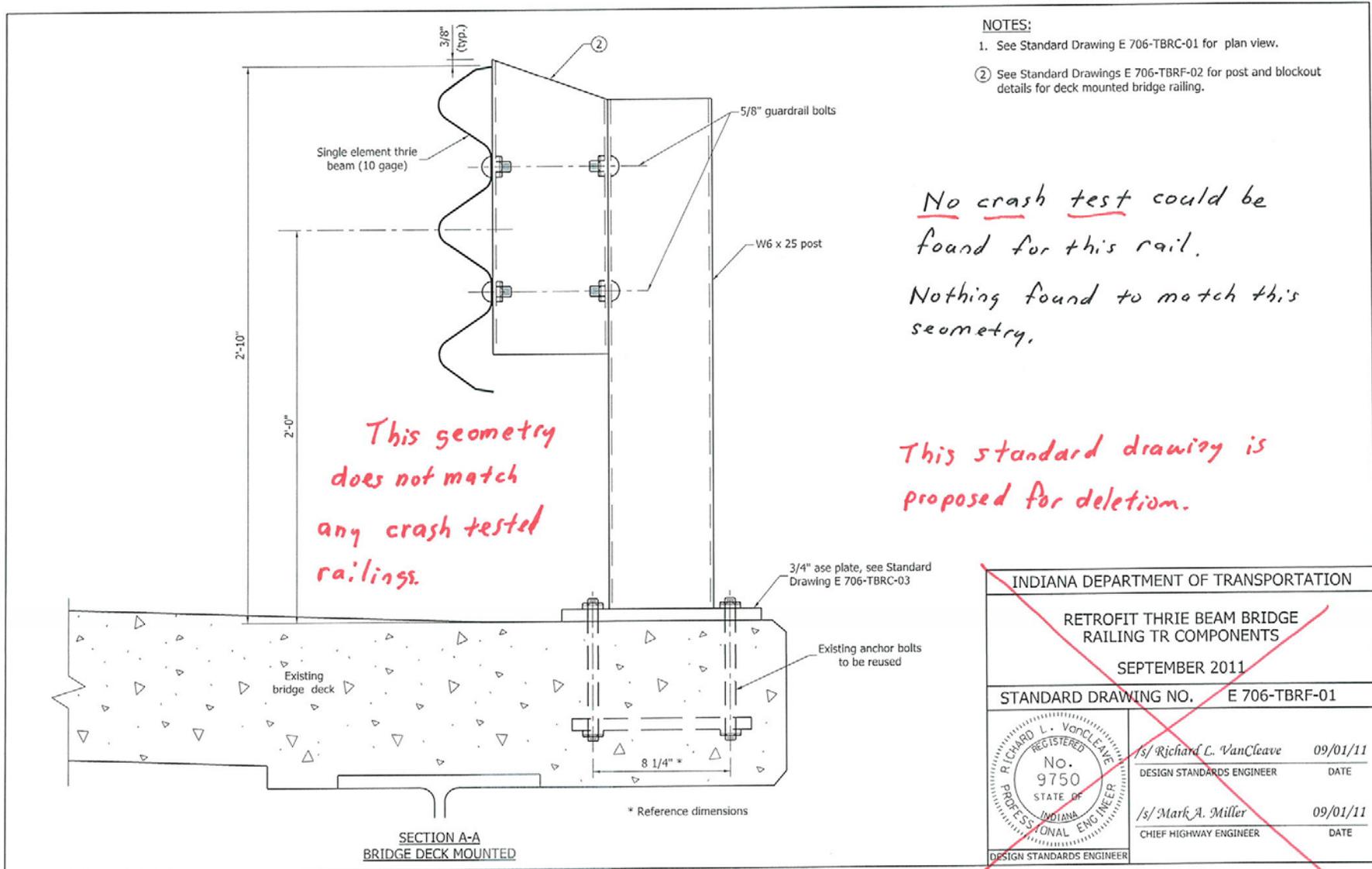
REVISION TO STANDARD DRAWINGS

REVISED NEW 706-~~TBR~~BRTR-06 RETROFIT THRIE BEAM GUARDRAIL HEIGHT TRANSITION (DRAFT)



REVISION TO STANDARD DRAWINGS

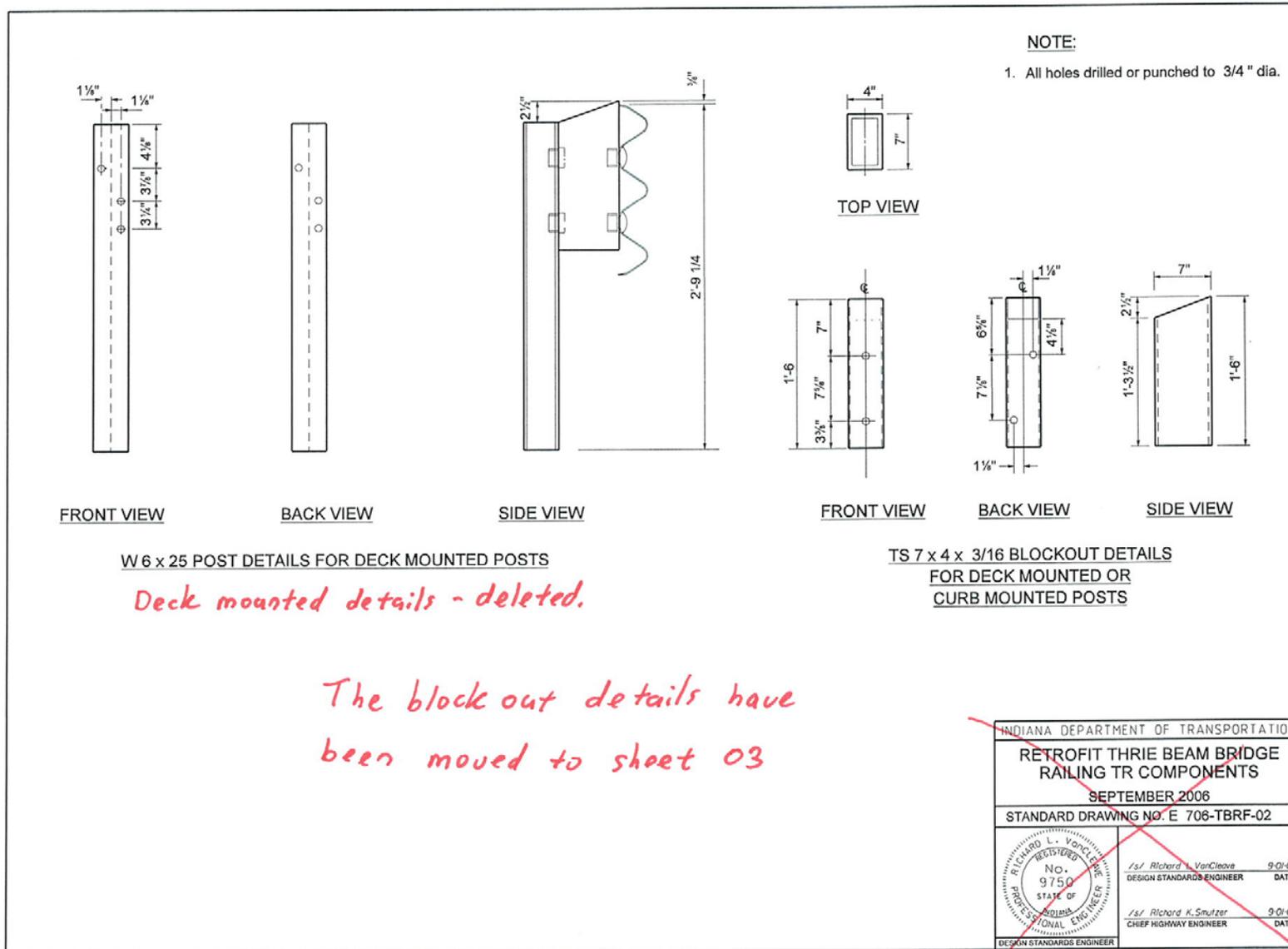
EXISTING 706-TBRF-01 RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS (PROPOSED TO DELETE)



INDIANA DEPARTMENT OF TRANSPORTATION	
RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS	
SEPTEMBER 2011	
STANDARD DRAWING NO.	E 706-TBRF-01
	/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-TBRF-02 RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS (PROPOSED TO DELETE)



Item No. 01 02/16/12 (2012 SS) (contd.)
Mr. Strain
Date: 02/16/12

REVISION TO STANDARD DRAWINGS

EXISTING 706-TBRF-02 RETROFIT THRIE BEAM BRIDGE RAILING TR COMPONENTS (PROPOSED TO DELETE)

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APPROVED MINUTES

REVISION TO DESIGN MANUAL

EXISTING IDM FIGURE 404-4B BRIDGE RAILING TYPES (TEST LEVEL 2) (WITH MARKUPS)

Railing Designation	TS-1 *	PF-2	PS-2	TX **
Height Designation	Common	Pedestrian	Pedestrian	Pedestrian
Mounting Location	On bridge coping	Flush with bridge deck	Atop sidewalk of minimum 5 ft width	Either atop sidewalk of 5 ft min. width, or flush with bridge deck
Railing Element	Three-beam with steel posts	2 steel tubes with steel posts on concrete parapet	2 steel tubes with steel posts on concrete parapet	Concrete
Total Height	2'-9" (5)	3'-6" (4)	3'-6"	3'-6"
Br. Rlg. Standard Drawings	n/a	706-BRPP-02, and -05, -06	706-BRPP-04 through -06	706-BRTX-01 through -04
Bridge Railing Transition	none	TPF-2	TPS-2	TTX
Br. Rlg. Trans. Standard Drawings	n/a	706-TTBP-03, -04, and -09	706-TTBP-07 through -09	706-TTIX-01 and -02
Guardrail Transition	TGS-1	TGB	TGB	TGB
Gdrl. Trans. Standard Drawings	n/a	601-TTGB-01 through -05	601-TTGB-01 through -05	601-TTGB-01 through -05

* Bridge railing type TS-1 may be used only on a local-public-agency collector or local road. Details for the bridge railing and transition are shown in INDOT Recurring Plan Detail 706-B-140d.

** Bridge railing type TX should be considered for an aesthetically-sensitive area.

BRIDGE-RAILING TYPES
 (Test Level 2)

Figure 61-6B

Now 404-4B

REVISION TO DESIGN MANUAL

EXISTING IDM FIGURE 404-4B BRIDGE RAILING TYPES (TEST LEVEL 4) (WITH MARKUPS)

Railing Designation	FC	TR ***	CF-1	PS-1	PF-1
Height Designation	Common	Common	Common	Pedestrian	Truck
Mounting Location	Flush with bridge deck	On existing concrete parapet	Flush with bridge deck	Atop sidewalk of minimum 5 ft width	Flush with bridge deck
Railing Element	Concrete, shape F	Thrie beam with steel posts (34")	2 steel tubes with steel posts on concrete curb	1 steel tube with steel posts on concrete parapet	1 steel tube with steel posts on concrete parapet
Total Height	2'-9" (33")	2'-10"	2'-11" 3' 3/4"	3'-6"	4'-2"
Br. Rlg. Standard Drawings	706-BCBR-01, -03, and -04	706-TBRC-01, -02, -03; -TBRE-01; -TBRF-01, -02	706-BRTM-01 and -02	706-BRPP-03, and -05, -06	706-BRPP-01, and -05, -06
Bridge Railing Transition	TBC	none	none	TPS-1	TPF-1
Br. Rlg. Trans. Standard Drawings	706-CBRT-01 through -03	n/a	n/a	706-TTBP-05 and -06	706-TTBP-01 and -02
Guardrail Transition	TGB	TGB	TGT	TGB	TGB
Gdrl. Trans. Standard Drawings	601-TTGB-01 through -05	601-TTGB-01 through -05	601-TTGT-01 and -02	601-TTGB-01 through -05	601-TTGB-01 through -05

Handwritten notes:
 A 36-Post
 This is a TL-2 rail Not TL-9
 Steel Post
 T.S. Post
 T.S. Post
 This rail is 42" rail NOT 4'2" (3'6")

*** Bridge railing type TR should be used only to replace existing aluminum bridge railing where no other modifications to a bridge are to be made, either as a spot improvement or within the limits of a 3R or 4R project.

BRIDGE-RAILING TYPES
(Test Level 4)

Figure 61-6B (Cont'd.)

Now 404-4B

REVISION TO DESIGN MANUAL

EXISTING IDM FIGURE 404-4B BRIDGE RAILING TYPES (TEST LEVEL 5) (WITH MARKUPS)

*Steel Posts
Require
Grade 50*

Railing Designation	FT	TF-2
Height Designation	Truck	Truck
Mounting Location	Flush with bridge deck	Flush with bridge deck
Railing Element	Concrete, shape F	2 steel tubes with steel posts on concrete parapet
Total Height	3'-9"	4'-2"
Br. Rlg. Standard Drawings	706-BCBR-02, -03, and -04	706-BRTF-01 through -10
Bridge Railing Transition	TBT	PBT
Br. Rlg. Trans. Standard Drawings	706-CBRT-01, through -03	706-TPBT-01 through -09
Guardrail Transition	TGB	TGB
Gdrl. Trans. Standard Drawings	601-TTGB-01 through -05	601-TTGB-01 through -05

To match crash test

Steel posts require 50 ksi steel

**BRIDGE-RAILING TYPES
(Test Level 5)**

Figure 61-6B (Cont'd.)

REVISION TO DESIGN MANUAL

REVISED IDM FIGURE 404-4B BRIDGE RAILING TYPES TEST LEVEL 2 (DRAFT)

Railing Designation	TS-1 *	CF-1	PF-2	PS-2	TX **
Height Designation	Common	Common	Pedestrian	Pedestrian	Pedestrian
Mounting Location	On bridge coping	Flush with bridge deck	Flush with bridge deck	Atop sidewalk of minimum 5 ft width	Either atop sdwk. of 5 ft min. width, or flush with bridge deck
Railing Element	Thrie-beam with steel posts	2 steel tubes with steel posts on concrete curb	2 steel tubes with steel posts on concrete parapet	2 steel tubes with steel posts on concrete parapet	Concrete
Total Height	2'-9"	3'-0 3/4"	3'-6"	3'-6"	3'-6"
Br. Rlg. Standard Drawings	n/a	706-BRTM-01 and -02	706-BRPP-02, and -05, -06	706-BRPP-04 through -06	706-BRTX-01 through -04
Bridge Railing Transition	none	none	TPF-2	TPS-2	TTX
Br. Rlg. Trans. Standard Drawings	n/a	n/a	706-TTBP-03, -04, and -09	706-TTBP-07 through -09	706-TTXX-01 and -02
Guardrail Transition	TGS-1	TGT	TGB	TGB	TGB
Gdrl. Trans. Standard Drawings	n/a	601-TTGT-01 and -02	601-TTGB-01 through -05	601-TTGB-01 through -05	601-TTGB-01 through -05

* Bridge railing type TS-1 may be used only on a local-public-agency collector or local road. Details for the bridge railing and transition are shown in INDOT Recurring Plan Detail 706-B-140d.

** Bridge railing type TX should be considered for an aesthetically-sensitive area.

**BRIDGE-RAILING TYPES
 TEST LEVEL 2**

**Figure 404-4B
 (Page 1 of 3)**



REVISION TO DESIGN MANUAL

REVISED IDM FIGURE 404-4B BRIDGE RAILING TYPES TEST LEVEL 4 (DRAFT)

Railing Designation	FC	TR ***	PS-1	PF-1
Height Designation	Common	Common	Pedestrian	Truck
Mounting Location	Flush with bridge deck	On existing concrete parapet	Atop sidewalk of minimum 5 ft width	Flush with bridge deck
Railing Element	Concrete, shape F	Thrie beam with steel posts	1 steel tube with steel posts on concrete parapet	1 steel tube with steel posts on concrete parapet
Total Height	2'-9"	2'-10"	3'-6"	3'-6"
Br. Rlg. Standard Drawings	706-BCBR-01, -03, and -04	706-TBRC-01, -02, -03; -TBRE-01; -TBRF-01, -02	706-BRPP-03, and -05, -06	706-BRPP-01, and -05, -06
Bridge Railing Transition	TBC	none	TPS-1	TPF-1
Br. Rlg. Trans. Standard Drawings	706-CBRT-01 through -03	n/a	706-TTBP-05 and -06	706-TTBP-01 and -02
Guardrail Transition	TGB	TGB	TGB	TGB
Gdrl. Trans. Standard Drawings	601-TTGB-01 through -05	601-TTGB-01 through -05	601-TTGB-01 through -05	601-TTGB-01 through -05

*** Bridge railing type TR should be used only to replace existing aluminum bridge railing where no other modifications to a bridge are to be made, either as a spot improvement or within the limits of a 3R or 4R project.

**BRIDGE-RAILING TYPES
 TEST LEVEL 4**

**Figure 404-4B
 (Page 2 of 3)**

REVISION TO DESIGN MANUAL

REVISED IDM FIGURE 404-4B BRIDGE RAILING TYPES TEST LEVEL 5 (DRAFT)

Railing Designation	FT	TF-2
Height Designation	Truck	Truck
Mounting Location	Flush with bridge deck	Flush with bridge deck
Railing Element	Concrete, shape F	2 steel tubes with steel posts on concrete parapet
Total Height	3'-9"	4'-2"
Br. Rlg. Standard Drawings	706-BCBR-02, -03, and -04	706-BRTF-01 through -10
Bridge Railing Transition	TBT	PBT
Br. Rlg. Trans. Standard Drawings	706-CBRT-01, through -03	706-TPBT-01 through -09
Guardrail Transition	TGB	TGB
Gdrl. Trans. Standard Drawings	601-TTGB-01 through -05	601-TTGB-01 through -05

**BRIDGE-RAILING TYPES
 TEST LEVEL 5**

**Figure 404-4B
 (Page 3 of 3)**

REVISION TO DESIGN MANUAL

DESIGN MEMORANDUM NO. 12 _ TECHNICAL ADVISORY (DRAFT)



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. 12-__ Technical Advisory

February 23, 2012 DRAFT

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

FROM: _____
Anthony L. Uremovich
Manager, Office of Bridge Standards and Policy
Bridge Design, Inspection, Hydraulics, and Technical Support
Division

SUBJECT: Bridge-Deck Pours

REVISES: *Indiana Design Manual* Section 404-2.06(02) items 2.a. and 6,
Figure 404-2F

EFFECTIVE: September 12, 2012, Letting

The bridge-deck-pour sequence and pour-rate information has been revised, as described in Recurring Special Provision 704-B-196, attached herewith. The provision should be included in each contract that includes a pay item for concrete, C, superstructure.

The *Indiana Design Manual* is revised as follows. Overstruck copy has been deleted. Italic copy has been added.

Section 404-2.06(02) item 2.a.

2. Transverse Construction Joint.

REVISION TO DESIGN MANUAL

DESIGN MEMORANDUM NO. 12 _ TECHNICAL ADVISORY (DRAFT)

- a. ~~Steel Beam or Girder Structure. Concrete may be placed continuously on a deck requiring less than 260 yd³ of concrete. A bridge deck that is poured integrally with the end bents may usually be placed with one pour.~~

~~For a longer structure that exceeds the pour volume limitation of 260 yd³, an alternative may be considered in which the~~ *The deck length is shall be* subdivided into segments near the points of final dead load contraflexure, with segments in positive flexure placed first and those in negative flexure last.

Section 404-2.06(02) item 6.

6. Pour Diagrams. Figure 404-2F illustrates the pour diagrams for a continuous, prestressed-concrete beam structure. The plans shall include a note similar to that shown on Figure 404-2F, revised as necessary. Figure 404-2G illustrates the pour diagrams for a continuous steel beam or girder structure. *A pour diagram for each multi-span structure shall be shown on the plans, regardless of the concrete quantity required.*

Figure 404-2F. The figure, showing the revision, is attached herewith.

alu
Attachment

[P:\Structural Services\Design Memos\Pending\2012\12DkPr-ta.doc]

COMMENTS AND ACTION

706.03 CONCRETE RAILING	
910.20 STEEL BRIDGE RAILING COMPONENTS	
706-BCBR-01-04	706-BRPP-01-06
706-BRTF-01-09	706-BRTM-01-02
706-BRTX-01-04	706-TBRC-01-06
706-TBRE-01	706-TBRF-01-02
Figure 404-4B	

DISCUSSION: This item was introduced and presented by Mr. Strain. Mr. Strain explained the revisions as they pertain to changes in drawing numbers, and to ensure the drawings now match what is shown on the plans and specifications, as described on the proposal sheet. Clarification was also made to ensure that the anchor bolts are high strength.

Each of the standard drawings being revised and updated and will be ready for the September lettings. Mr. Strain also explained the modifications that are being incorporated in each set of drawings are for clarification and some minor corrections. Some revisions to drawings will also require revisions to the Design Manual, which Mr. Strain will implement.

Mr. Heustis inquired about having a construction joint and how the rail will be accomplished when the pour is not continuous. Mr. Strain stated that the intention is to be consistent with the standard specifications and the Design Manual with regard to the Standard Drawings. Also, there may be joints, but those joints may also require a plate to cover any gap, so the rail will appear joint-less. The intention is to avoid any butt-joints.

Mr. Uremovich pointed out that this is just for the railings - next month we'll be looking at the transitions.

Motion: Mr. Strain Second: Mr. Cales Ayes: 9 Nays: 0	Action: <input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
Standard Specifications Sections affected: 706.03 pg 525; 910.20 pg 903	<input type="checkbox"/> 20 Standard Specifications Book <input type="checkbox"/> Revise Pay Items List
Recurring Special Provision affected: NONE	<input checked="" type="checkbox"/> Create RSP (No. TBD) Effective <u>Sept. 01, 2012</u> Letting RSP Sunset Date: <u> </u>
Standard Sheets affected: 706-BCBR-01 - 03 706-BCBR-04 706-BRPP-01 - 06 706-BRTF-01 - 03 706-BRTF-04 - 09 706-BRTM-01 - 02 706-BRTX-01 - 04 706-TBRC-01 - 03 706-TBRE-01 706-TBRF-01 - 02	<input type="checkbox"/> Revise RSP (No. <u> </u>) Effective <u> </u> Letting RSP Sunset Date: <u> </u> Standard Drawing Effective <u>Sept. 01, 2012</u> <input type="checkbox"/> Create RPD (No. <u> </u>) Effective <u> </u> Letting <input type="checkbox"/> Technical Advisory
Design Manual Sections affected: NONE	GIFE Update Req'd.? Y <u> </u> N <u> </u> By <u> </u> Addition or <u> </u> Revision
GIFE Sections cross-references: NONE	Frequency Manual Update Req'd? Y <u> </u> N <u> </u> By <u> </u> Addition or <u> </u> Revision Received FHWA Approval? <u>YES</u>

SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Minor adjustments are needed to the 711.08 structural steel specification section as it relates to fabricators providing mill test reports.

PROPOSED SOLUTION: Modify the language in the 711.08 section to require a copy of all mill test reports as fabrication begins. With material test reports being sent electronically today there is no reason for any fabricator to not ever have the material test report when the material arrives at the fabrication facility.

APPLICABLE STANDARD SPECIFICATIONS: 711.08

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 711 recurring special provision or, add this language into the soon-to-be issued 711 provision regarding field welding that passed last month since the bases for use will be identical.

PAY ITEMS AFFECTED: None

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT

Phone Number: 2-5502

Date: January 31, 2012

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad Hoc group consisting of: Gary Chestnut, Kevin Day, Greg Pankow, Jim Reilman, Mike Rumer, and Brent Schmitt.

REVISION TO SPECIFICATIONS

SECTION 711 - STEEL STRUCTURES

711.08 MILL TEST REPORTS

The Standard Specifications revised as follows:

SECTION 711, BEGIN LINE 116, DELETE AND INSERT AS FOLLOWS:

711.08 Mill Test Reports

~~Prior to, or concurrent with, the fabrication,~~ *A copy of the all mill test reports for all steel on hand that is to be used to fabricate structural steel members shall be furnished prior to the start of fabrication. For steel not on hand when fabrication is started that arrives during fabrication, a copy of the mill test reports for that steel shall be provided within 24 h of receipt of the steel. If copies of mill test reports are not provided within the specified timeframe, the Engineer may suspend the fabrication of all structural steel members until such time that copies of the missing mill test reports are provided. Delays due to suspension of fabrication will be considered non-excusable. If the manufacturer's mill test reports are not available, tests shall be made with no additional payment, and 4 certified copies of such tests shall be furnished. Four copies of an affidavit shall be furnished which shall state that the materials to be used for members not designated for calculated stress and not to be marked in accordance with ASTM A 6 (ASTM A 6M), Article 9, are in accordance with the requirements of the specifications for the materials as shown on the plans. The fabricator shall have on file the mill test reports for the material from which these members were obtained.*

APPROVED

COMMENTS AND ACTION

711.08 MILL TEST REPORTS

DISCUSSION: This item was introduced by Mr. Pankow, and further explained by Mr. Reilman who described the reasoning behind this revision as shown on the proposal page and as illustrated in the attached specification section 711.08.

Mr. Reilman explained that there should be no reason why the fabricator cannot provide the mill certs in a timely manner.

Mr. Pankow asked that this be included with the similar item approved from last month's meeting, item number 4, involving section 711, Structural Steel. And be made effective at the same time.

All agreed.

Motion: Mr. Pankow Second: Mr. Keefer Ayes: 9 Nays: 0	Action: <input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
Standard Specifications Sections affected: 711.08 pg 554; 910.02 pg 876.	<input checked="" type="checkbox"/> 2014 Standard Specifications Book <input type="checkbox"/> Revise Pay Items List
Recurring Special Provision affected: NONE	<input checked="" type="checkbox"/> Combine with RSP (No. 711-B-195) Effective <u>Sept. 01, 2012</u> Letting RSP Sunset Date: <u>Sept. 01, 2013</u> <input type="checkbox"/> Revise RSP (No. ___) Effective ___ Letting RSP Sunset Date: ___
Standard Sheets affected: NONE	Standard Drawing Effective ___ <input type="checkbox"/> Create RPD (No. ___) Effective ___ Letting <input type="checkbox"/> Technical Advisory
Design Manual Sections affected: NONE	GIFE Update Req'd.? Y ___ N ___ By ___ Addition or ___ Revision
GIFE Sections cross-references: Section 5.7.2	Frequency Manual Update Req'd? Y ___ N ___ By ___ Addition or ___ Revision Received FHWA Approval? <u>YES</u>