Index 400
Guardrail

ORIGINATION

Date: August 4, 2017
Name: Richard Stepp
Phone: (850) 414-4319
Email: richard.stepp@dot.state.fl.us

COMMENTARY

Sheet 20: add details for terminating pipe rail on steel posts

COMMENTS AND RESPONSES

BLACK = Industry Review Comments **RED** = Standard Plans Response

Name: Russell Gilbert
Date: Thursday, August 31, 2017 10:06 AM

COMMENT:
Suggestion for additional revision to the 2018-19 Index 400.
Index 400 sheet 20 of 22 Rail Splice Detail. The ½" Hex Head bolt is only needed on one side of the splice. (Similar to Index 870 and 880 Handrail splices) After it is plugged 6" into the next piece of pipe and bolted to the post mount brackets the Rail splice cannot move. This would save some field drilling of the pipe rail thus save the department some cost on this item.

RESPONSE:
Date: 9/19/2017

One bolt is placed on either side of the Pipe Rail splice (two bolts per splice) for crashworthiness considerations. The intent is to prevent free ends of Pipe Rail from becoming spearing hazards after being dislodged by errant vehicle impacts with the guardrail. As a result, the Index will remain as-is, with two bolts per splice. Okay as-is.

Guardrail

Name: Steven Wright
Date: Wednesday, September 13, 2017 1:12 PM

COMMENT:

1) Summary of the changes (Origination Form, Sheet 2)
    a. Origination form says 6'-0" CRT post option is on Sheet 11, but it's actually Sheet 12
    b. Origination form says update 1.25" bolt on Sheet 15 among others, but bolt is not on Sheet 15
2) PDF Index 536-001 Sheet 11 of 22
    a. See number 1 above
3) PDF Index 536-001 Sheet 15 of 22
    a. Hole Layout: On Thrie-Beam Terminal Connector, callout looks to say 5 bolt holes, but 7 are shown.
    b. Hole Size: These are called out as 15/16" holes, but are usually 1" diameter.
4) PDF Index 536-001 Sheet 18 of 22
    a. Should 1¼" length bolts get changed to 2" bolts like the other sheets (at Thrie-Beam Terminal connectors).
5) PDF Index 536-001 Sheet 19 of 22
    a. Carriage Bolts are typically used for panel splices and connection to Post.
6) PDF Index 536-001 Sheet 21 of 22
    a. Does 13/16" hole size substitution per Sheet 5 apply on Sheet 21?

RESPONSE:
Date: 9/19/2017

1) Summary of the changes (Origination Form, Sheet 2)
    a. Sheet 11: Correct. The 6'-0" CRT post option made it into the previous Errata on Sheet 12 (it references from Sheet 11).
    b. Sheet 15: Correct. This wasn't required on Sheet 15.
2) PDF Index 536-001 Sheet 11 of 22
    a. See number 1 above
3) PDF Index 536-001 Sheet 15 of 22
    a. Hole Layout: The callout refers to 5 rows of bolt holes (only 5 bolt holes are used). This is the same Standard piece RTE01b that's been in use for prior decades (http://mwrsf-qa.unl.edu/attachments/575de1d94ad6db47b4300e40ddf86c7c.pdf) Since this is a Standard piece that manufacturers have been producing for past decades to accommodate Florida and other states, the FDOT is continuing use of this standard piece without changing its configuration. The callout will be revised to remove the quantity to avoid misinterpretation.

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Guardrail

   b. Hole Size: General Note 3 explains that these components are based on English Unit conversations of the AASHTO-AGC-ARTBA Task Force 13 Guide to Standardized Barrier Hardware (per the link above). If the English unit conversion is reasonably close to the AASHTO hardware details and will not affect the bolt's performance, you can use what pieces you've used in prior years given a history of acceptable performance. The FDOT hasn't changed these hole size requirements since the late 1990's, so we don't expect a new impact to fabrication. Okay as-is.

4) PDF Index 536-001 Sheet 18 of 22
   a. Panels are not nested at this location, so 1¼" length bolts still apply. Okay as-is.
5) PDF Index 536-001 Sheet 19 of 22
   a. The bolts you've specified follow the same policy as last year's Standard. If you cannot use the bolt types called for, then please inform of specific (dimensional) information on the bolt types you require. Okay as-is.
6) PDF Index 536-001 Sheet 21 of 22
   a. Backwards compatibility to 13/16" holes are applicable to this Special Steel Post, where the hole layout and function are identical to Standard Posts it is substituting for per Note 1. We will update Note 3 on Sheet 5 to further clarify applicability.

Name: Karina Fuentes, P.E.
Date: Monday, September 25, 2017 5:30 PM

COMMENT:

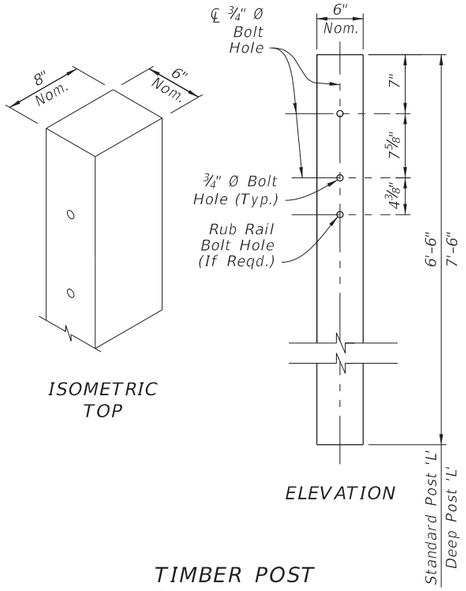
1. Sheet 5 of 22: Recommend to maintain the 13/16 in. bolt holes specification for steel posts and steel block since holes are pre-drilled the greater diameter will allow for hole alignment adjustment without field modification.
2. Sheet 1 General Notes: Nested W-Beam - Suggest to further clarify the definition of nested beams: "Where called for in the Plans, install two W-Beam panels mounted flush (stacked together)…"
3. Sheet 6 of 22 (Guardrail Sections): In the "Shoulder Sections", should retain the "1:10 max." label; it is explained in the new added note.
4. Sheets 7/8 of 22: Recommend to include the note regarding the disallowance of special steel posts, encased posts, etc. in approach terminal segments to sheet 1 (general notes) of this Index. Also, the note should be expanded to clarify that it applies to ALL approach treatments (approaches to bridges, etc.) and also to trailing ends of end anchorages.

RESPONSE:
Date: 9/26/2017

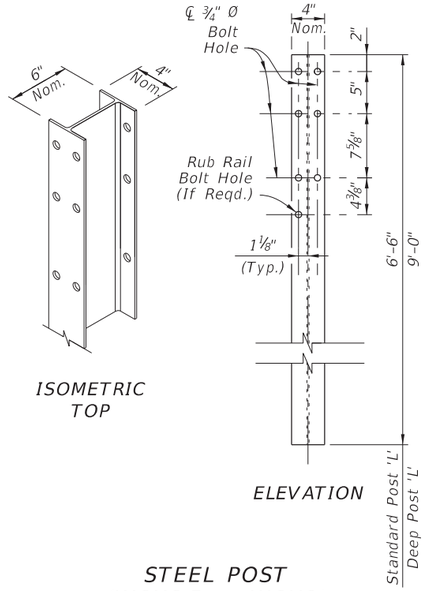
1) The 13/16" bolt hole size is still permitted. It is being maintained for backwards compatibility per the new Note 3 on Sheet 5 (Note: The default 3/4" bolt hole follows the national MGS design). Okay as-is.
2) Nested panels have historically been a common practice, and the new General Note has a sufficient description. Okay as-is.
3) We've made the 1:10 max callout less prominent, particularly on shoulders, in order to avoid the interpretation that 1:10 max is the only shoulder slope requirement.

Contractors should look to the Plans for these actual slopes, and designers should look to the FDM. Okay as-is.

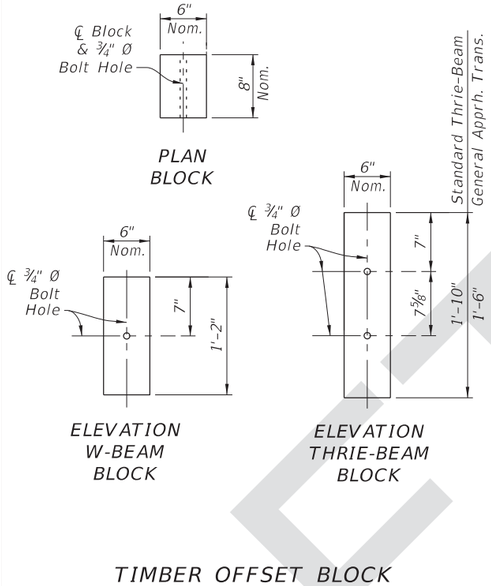
4) There is no requirement to prevent usage of Special Posts within an Approach Transition Connection to Rigid Barrier, and the Trailing Anchorage has the required posts specifically defined in the drawing. As a result, the exclusion policy can be directed solely to Approach Terminals on Sheet 7. This Special Post requirement is grouped with similar requirements for Approach Terminals on Sheet 7. Okay as-is.



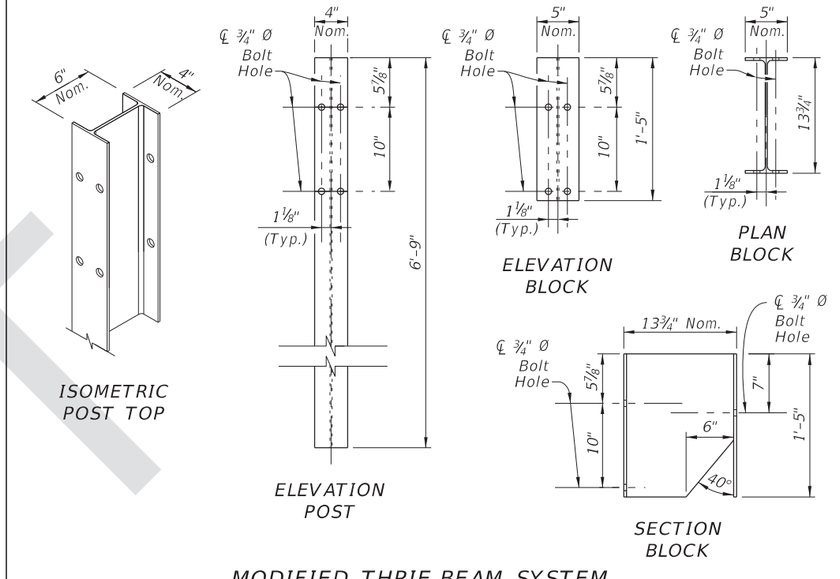
TIMBER POST
(6"X8" Nominal)



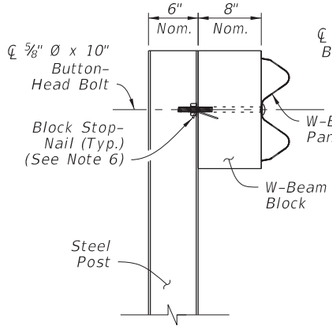
STEEL POST
(W6X8.5 or W6X9)



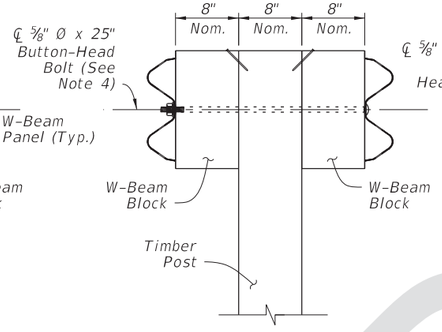
TIMBER OFFSET BLOCK
(6"X8" Nominal)



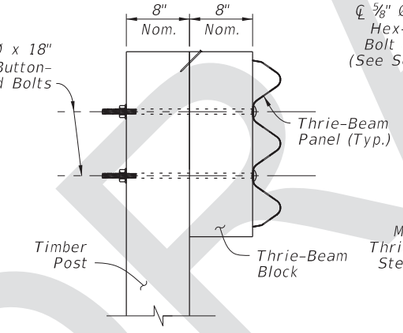
MODIFIED THRIE-BEAM SYSTEM
(W6X8.5 or W6X9 Steel Post & W14X22 Steel Block)



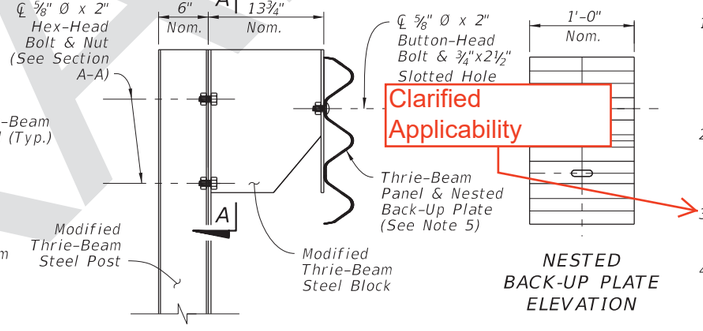
W-BEAM
STEEL POST
(Timber Post
Similar)



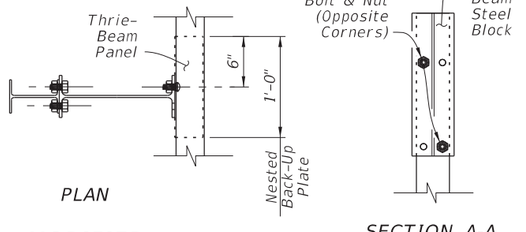
DOUBLE FACED W-BEAM
TIMBER POST
(Thrie-Beam Similar)
(Steel Post Similar)



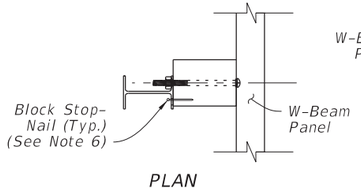
THRIE-BEAM
TIMBER POST
(Steel Post Similar)



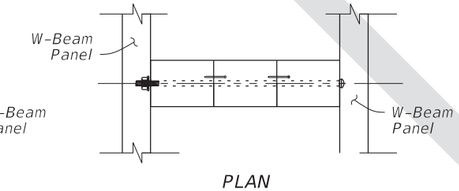
Clarified Applicability



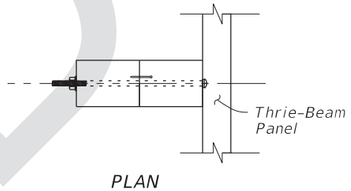
MODIFIED
THRIE-BEAM
(Steel Post Only)



W-BEAM
STEEL POST
(Timber Post
Similar)



DOUBLE FACED W-BEAM
TIMBER POST
(Thrie-Beam Similar)
(Steel Post Similar)



THRIE-BEAM
TIMBER POST
(Steel Post Similar)

NOTES:

1. *STANDARD POSTS: Where Standard Posts are called for in this Index, use either a Timber Post or Steel Post at the Length, 'L', shown for Standard Posts. Use a single post material type consistently per each run of guardrail. Only where specified in the Plans, use the Deep Post 'L' for Slope Break Conditions as shown on Sheet 6.*
2. *OFFSET BLOCKS: For each Panel type, install the corresponding Offset Block type as shown. For General, TL-3 (Single Faced) Approach Transitions only, use the 1'-6" Thrie-Beam Block (See Sheet 13).*
3. *BOLT HOLES: ¾" Ø Bolt Holes shown may be substituted with $^{13}/_{16}$" Ø Bolt Holes at the option of the contractor.*
4. *DOUBLE FACED GUARDRAIL: Orient Post Bolts with the Button-Head located on the side nearest the traffic lane. The bolt's threaded portion is not permitted to extend beyond ¾" from the face of the tightened nut; trim the threaded portion as needed and galvanize in accordance with Specification Section 562.*
5. *MODIFIED THRIE-BEAM NESTED BACK-UP PLATE: At each post connection, install a Nested Back-up Plate between the Thrie-Beam Panel and the post. The Nested Back-up Plate has a cross-section and material matching the Thrie-Beam Panel Section.*
6. *BLOCK STOP-NAIL: Drive one nail per Standard Offset Block as shown to prevent Block rotation. Use steel 3½" Type 16d nails with ASTM A153 hot-dip galvanization. For steel posts, drive the nail through the unused flange Bolt Hole and bend the nail so its head contacts the flange.*
7. *MATERIALS: Use timber and steel posts and offset blocks in accordance with Specification Section 967. Composite offset blocks may be substituted as approved on the APL. Use a single offset block type consistently per each run of guardrail. Steel offset blocks are only permitted for Modified Thrie Beam.*

POST AND OFFSET BLOCK DETAILS

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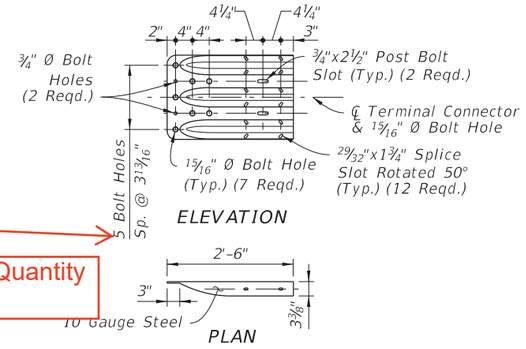

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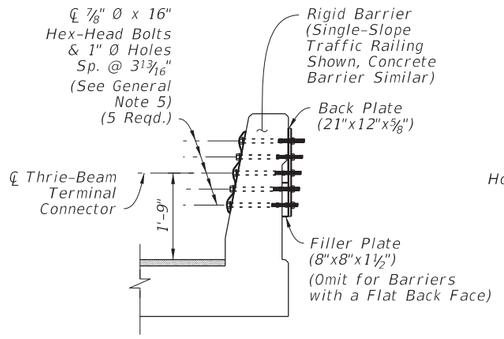
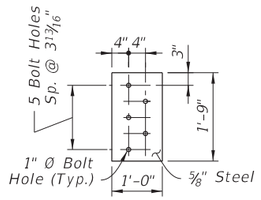
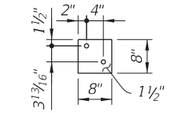
THRIE-BEAM TERMINAL CONNECTOR DETAIL



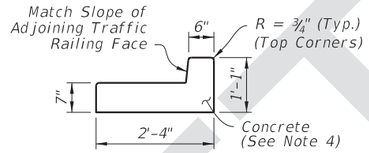
SECTION A-A RIGID BARRIER TERMINAL CONNECTOR MOUNT



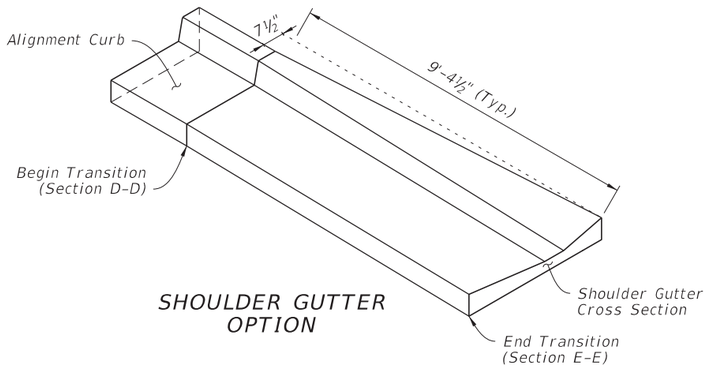
BACK PLATE



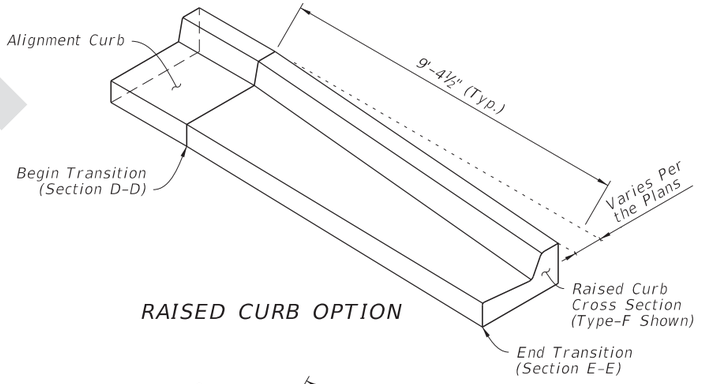
FILLER PLATE



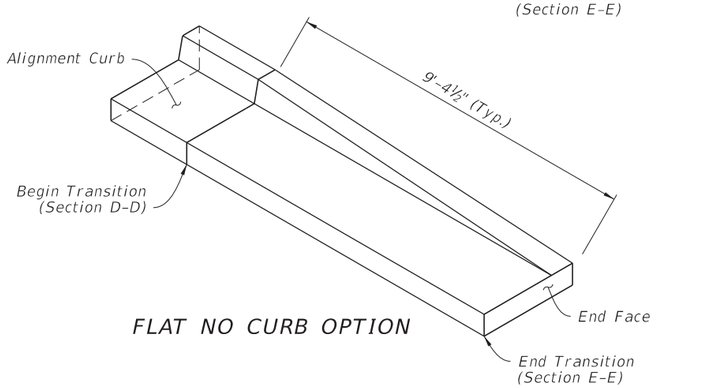
ALIGNMENT CURB SECTION



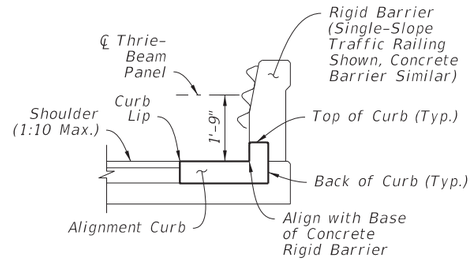
SHOULDER GUTTER OPTION



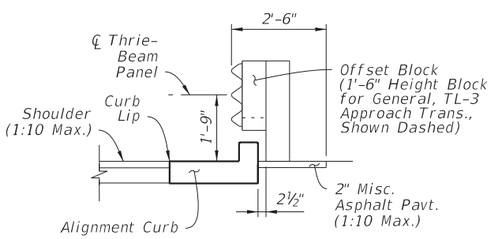
RAISED CURB OPTION



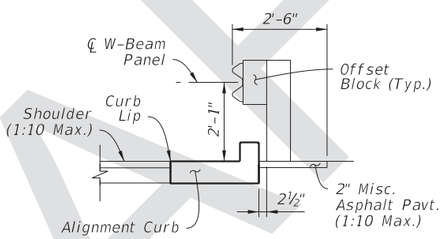
FLAT NO CURB OPTION



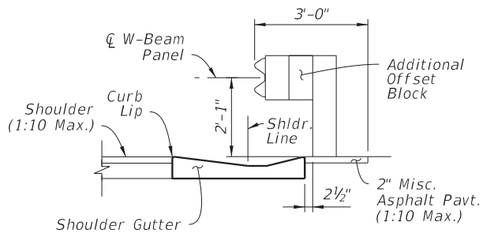
SECTION B-B BEGIN ALIGNMENT CURB (Mate to Rigid Barrier)



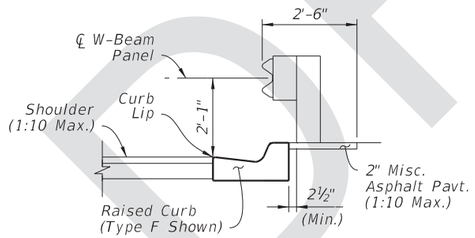
SECTION C-C ALIGNMENT CURB (Intermediate)



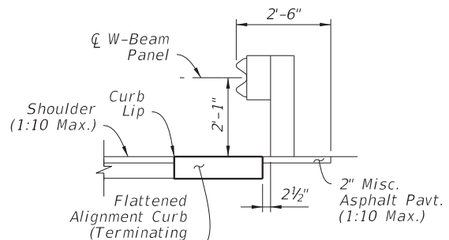
SECTION D-D BEGIN TRANSITION (End Alignment Curb)



SECTION E-E END TRANSITION SHOULDER GUTTER OPTION



SECTION E-E END TRANSITION RAISED CURB OPTION



SECTION E-E END TRANSITION FLAT NO CURB OPTION

CURB TRANSITION ISOMETRIC VIEWS

NOTES:

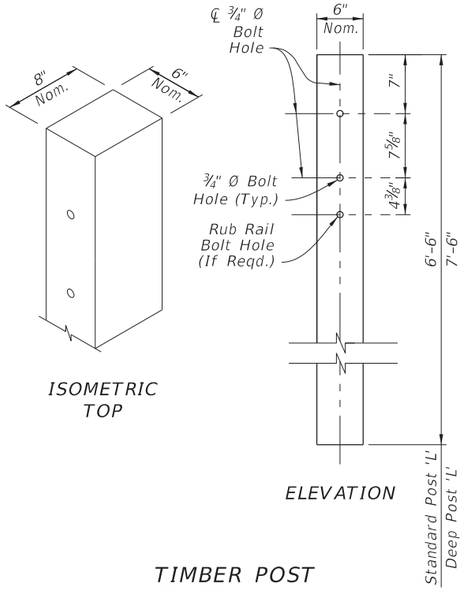
1. PLAN AND ELEVATION VIEWS: Work with Sheets 13 & 14.
2. END TRANSITION OF CURB OPTION: Install one of the three End Transition types shown per Section E-E as indicated by the plans.
3. GRADING BEHIND POSTS: Place Slope Break a Min. 2'-0" behind the post, per Sheet 6.
4. MATERIALS & CONSTRUCTION: Construct the concrete Aligning Curb and Curb transition in accordance with Specification Section 520. Use steel Plates and Thrie-Beam Terminal Connectors in accordance with Specifications Section 967.

CURB TYPICAL SECTIONS

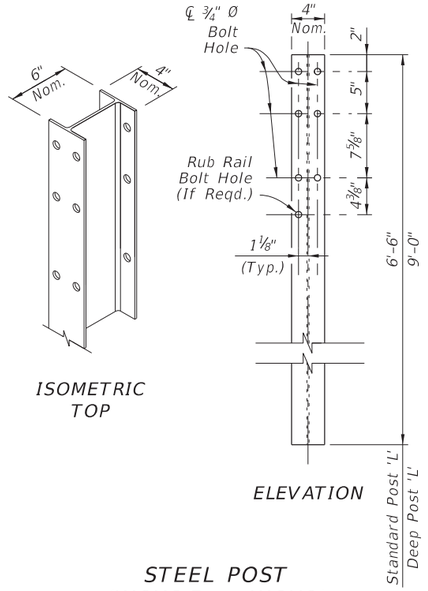
APPROACH TRANSITION CONNECTION - DETAILS

8/29/2017 1:44:27 PM

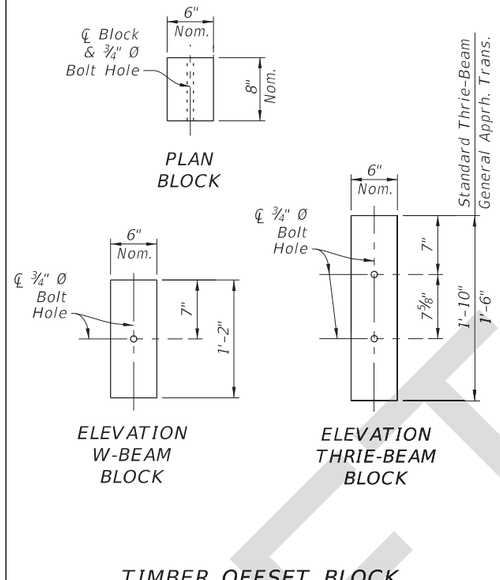
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	GUARDRAIL	INDEX	SHEET
11/01/17						536-001	15 of 22



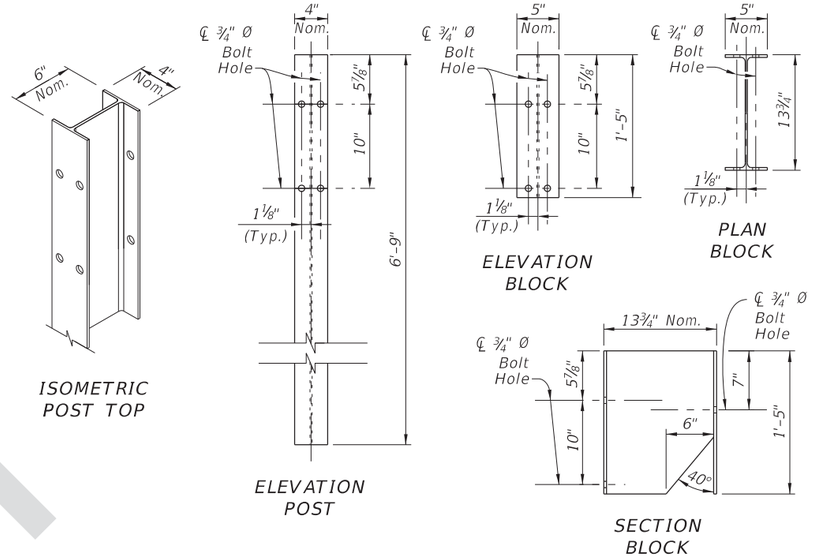
TIMBER POST
(6"X8" Nominal)



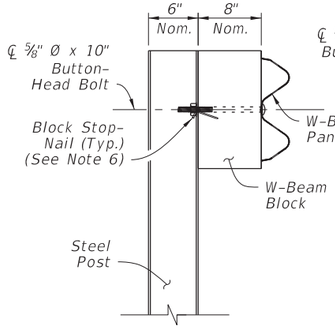
STEEL POST
(W6X8.5 or W6X9)

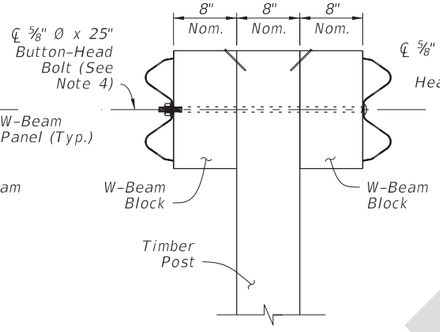


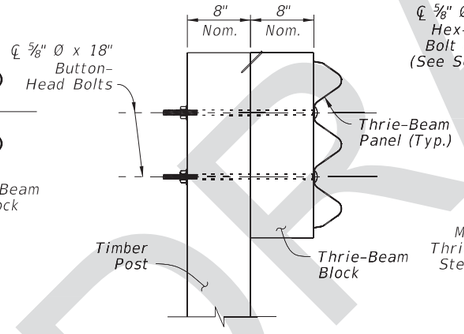
TIMBER OFFSET BLOCK
(6"X8" Nominal)

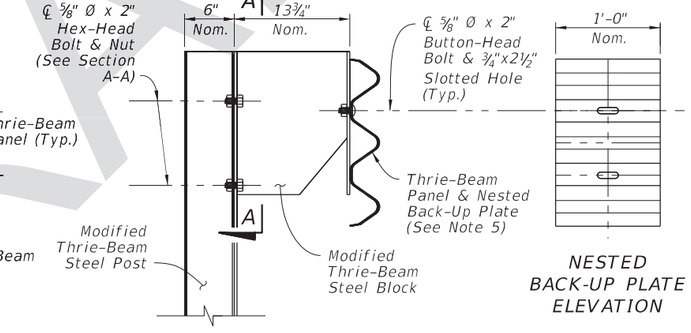


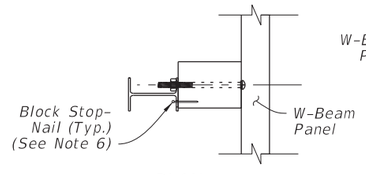
MODIFIED THRIE-BEAM SYSTEM
(W6X8.5 or W6X9 Steel Post & W14X22 Steel Block)

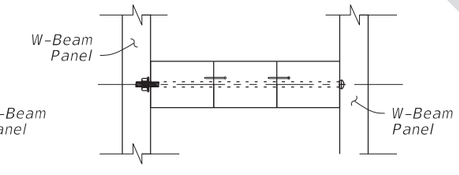


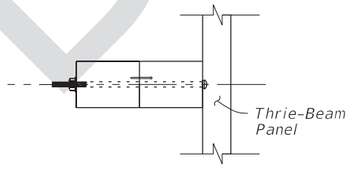


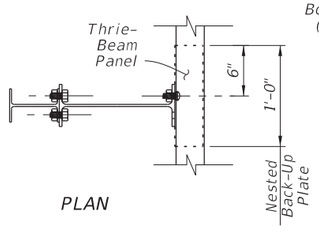


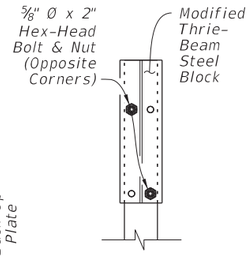












W-BEAM
STEEL POST
(Timber Post
Similar)

DOUBLE FACED W-BEAM
TIMBER POST
(Thrie-Beam Similar)
(Steel Post Similar)

THRIE-BEAM
TIMBER POST
(Steel Post Similar)

MODIFIED
THRIE-BEAM
(Steel Post Only)

NOTES:

1. STANDARD POSTS: Where Standard Posts are called for in this Index, use either a Timber Post or Steel Post at the Length, 'L', shown for Standard Posts. Use a single post material type consistently per each run of guardrail. Only where specified in the Plans, use the Deep Post 'L' for Slope Break Conditions as shown on Sheet 6.
2. OFFSET BLOCKS: For each Panel type, install the corresponding Offset Block type as shown. For General, TL-3 (Single Faced) Approach Transitions only, use the 1'-6" Thrie-Beam Block (See Sheet 13).
3. BOLT HOLES: ¾" Ø Bolt Holes shown in posts within this Index may be substituted with $^{13}/_{16}$" Ø Bolt Holes.
4. DOUBLE FACED GUARDRAIL: Orient Post Bolts with the Button-Head located on the side nearest the traffic lane. The bolt's threaded portion is not permitted to extend beyond ¾" from the face of the tightened nut; trim the threaded portion as needed and galvanize in accordance with Specification Section 562.
5. MODIFIED THRIE-BEAM NESTED BACK-UP PLATE: At each post connection, install a Nested Back-up Plate between the Thrie-Beam Panel and the post. The Nested Back-up Plate has a cross-section and material matching the Thrie-Beam Panel Section.
6. BLOCK STOP-NAIL: Drive one nail per Standard Offset Block as shown to prevent Block rotation. Use steel 3½" Type 16d nails with ASTM A153 hot-dip galvanization. For steel posts, drive the nail through the unused flange Bolt Hole and bend the nail so its head contacts the flange.
7. MATERIALS: Use timber and steel posts and offset blocks in accordance with Specification Section 967. Composite offset blocks may be substituted as approved on the APL. Use a single offset block type consistently per each run of guardrail. Steel offset blocks are only permitted for Modified Thrie Beam.

POST AND OFFSET BLOCK DETAILS

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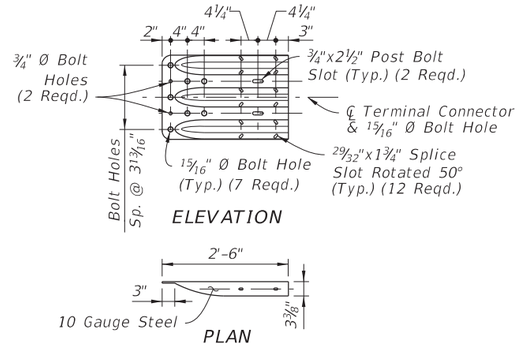
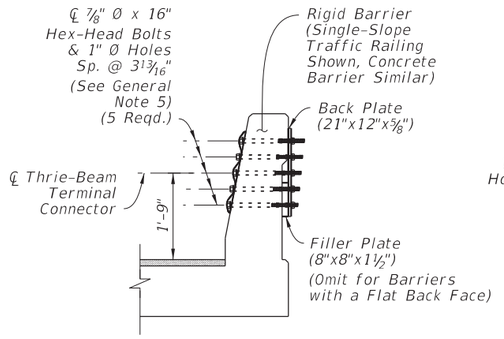
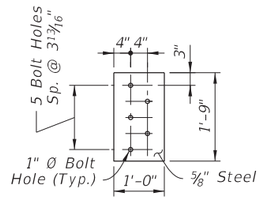


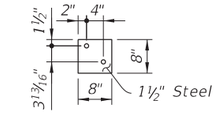
THRIE-BEAM TERMINAL CONNECTOR DETAIL



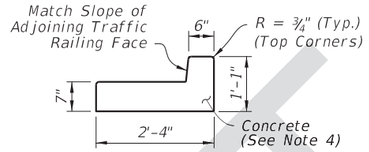
SECTION A-A RIGID BARRIER TERMINAL CONNECTOR MOUNT



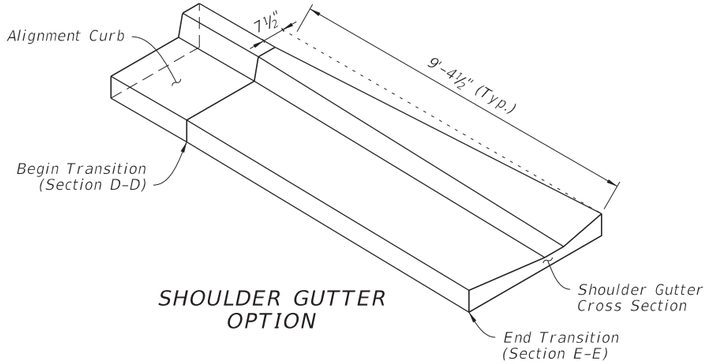
BACK PLATE



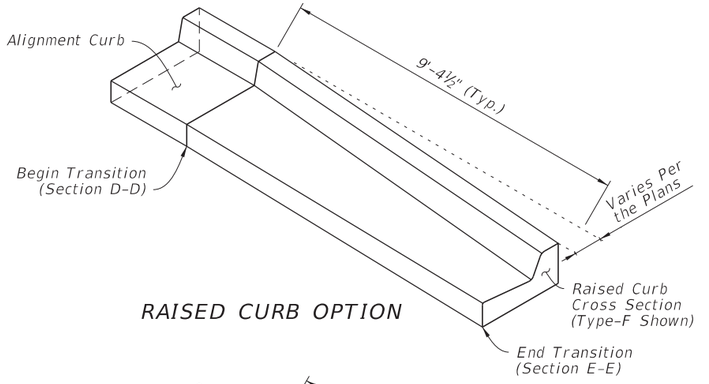
FILLER PLATE



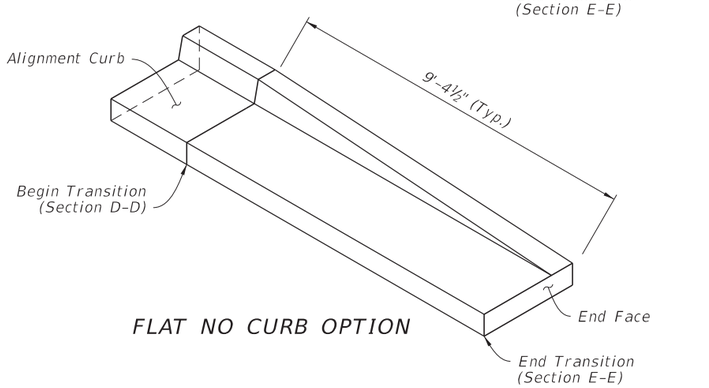
ALIGNMENT CURB SECTION



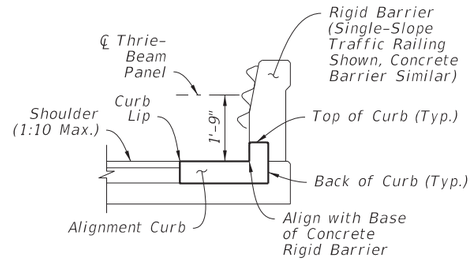
SHOULDER GUTTER OPTION



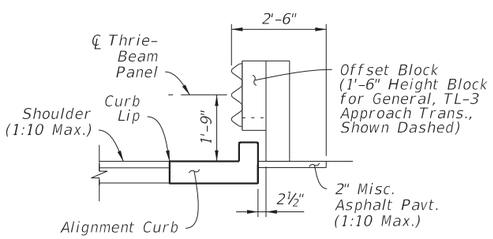
RAISED CURB OPTION



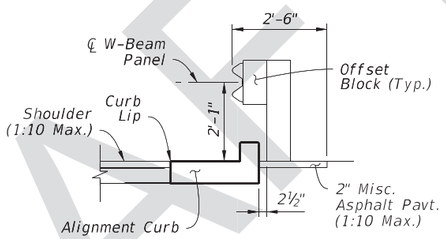
FLAT NO CURB OPTION



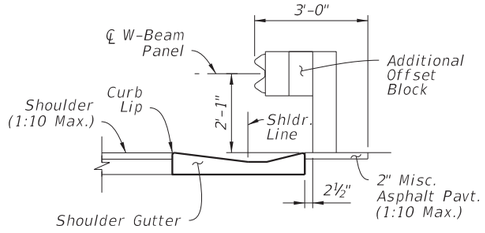
SECTION B-B BEGIN ALIGNMENT CURB (Mate to Rigid Barrier)



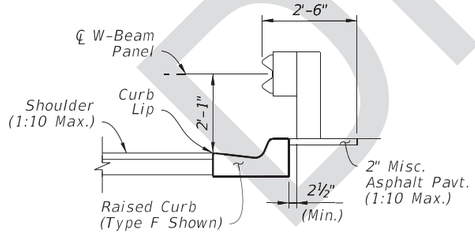
SECTION C-C ALIGNMENT CURB (Intermediate)



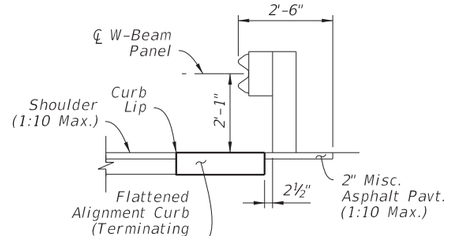
SECTION D-D BEGIN TRANSITION (End Alignment Curb)



SECTION E-E END TRANSITION SHOULDER GUTTER OPTION



SECTION E-E END TRANSITION RAISED CURB OPTION



SECTION E-E END TRANSITION FLAT NO CURB OPTION

CURB TYPICAL SECTIONS

CURB TRANSITION ISOMETRIC VIEWS

NOTES:

1. PLAN AND ELEVATION VIEWS: Work with Sheets 13 & 14.
2. END TRANSITION OF CURB OPTION: Install one of the three End Transition types shown per Section E-E as indicated by the plans.
3. GRADING BEHIND POSTS: Place Slope Break a Min. 2'-0" behind the post, per Sheet 6.
4. MATERIALS & CONSTRUCTION: Construct the concrete Aligning Curb and Curb transition in accordance with Specification Section 520. Use steel Plates and Thrie-Beam Terminal Connectors in accordance with Specifications Section 967.

APPROACH TRANSITION CONNECTION - DETAILS

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