Alternative Roadway Paving Treatments

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PPM, Vol. 1, Chapter 2
Section 2.1.6.1

"In cases where existing alternative pavement is being removed as part of a Department project, replacement of such pavement shall adhere to the requirements in this section regardless of the circumstances of the original installation and maintenance."

- Maintenance Memorandum of Agreement shall be entered into with the local government agency
- Local agencies must fund and maintain, including testing

Bridge Railing

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PPM, Vol. 1, Chapter 25
Section 25.4.24.3

- Address bridge rail on RRR projects
- Practical Design allows some flexibility

KEY INFORMATION

- Obsolete bridge rail requires a Design Variation

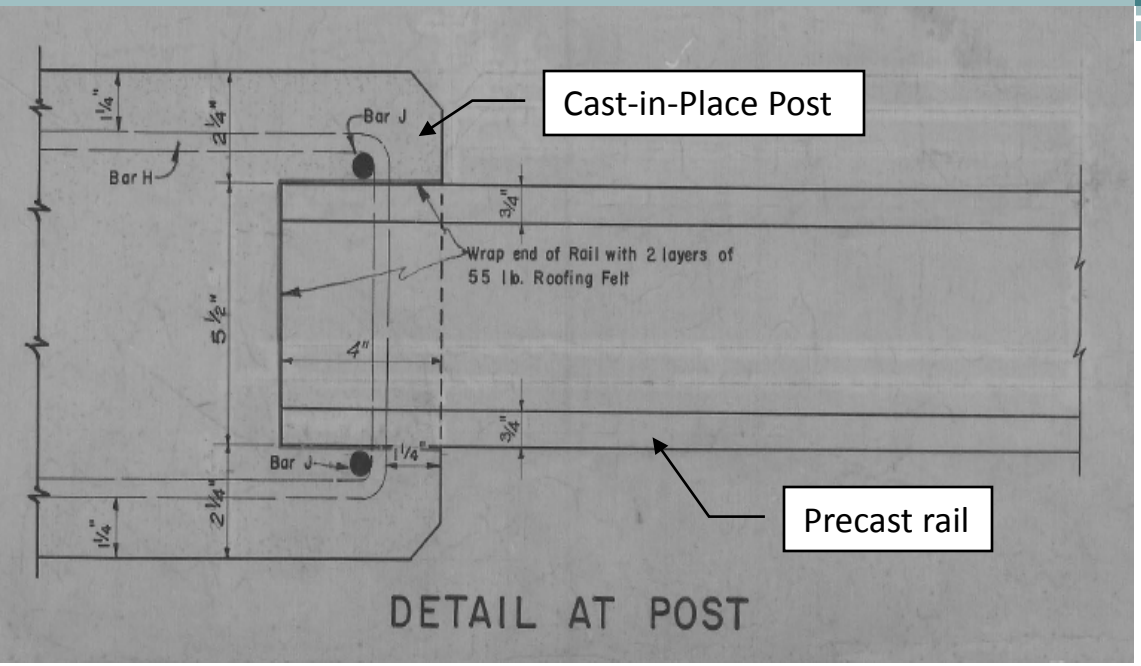
  FHWA's Mitigation Strategies for Design Exceptions: Bridge rail that is structurally sound and meets current crash test standards is an important safety consideration, and updating substandard barrier is an important safety improvement on 3R and other projects. However, the type or condition of bridge rail is not considered to be one of the 13 controlling criteria that require a formal design exception.

- Inadequate approach bridge rail transitions require correction.

- Except for continuous post & beam rail, all obsolete rail must be upgraded or obtain a Design Variation.

Structurally Discontinuous Post & Beam Rail

- No structural continuity between rail members and posts.
- Higher severity of crashes at all design speeds.



Structurally Discontinuous Post & Beam Rail

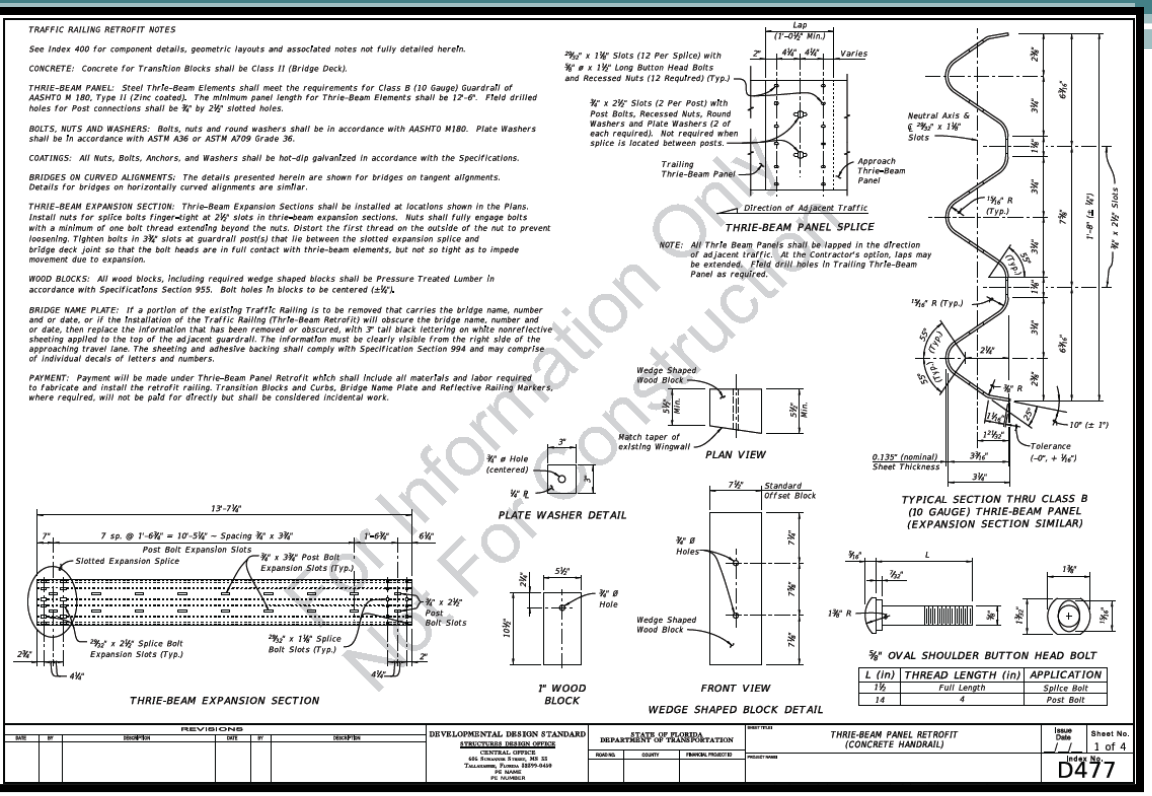
- No structural continuity between rail members and posts.

PPM, Vol. 1, Chapter 25
Section 25.4.24.3

- No structural work being performed on the bridge.
- No changes in the existing approach roadway alignment or cross section.
- No crash record or evidence of impact.

PPM, Vol. 1, Chapter 25
Section 25.4.24.3

- A new Design Standard 404 will be published in July 2013
- Until then, the designer must provide plan details for attaching the standard approach guardrail transition to the bridge rail.



TRAFFIC RAILING RETROFIT NOTES

See Index 400 for component details, geometric layouts and associated notes not fully detailed herein.

CONCRETE: Concrete for Transition Blocks shall be Class II (Bridge Deck).

THRIE-BEAM PANEL: Steel Thrie-Beam Elements shall meet the requirements for Class B (10 Gauge) Guardrail of AASHTO M 180, Type II (Zinc coated). The minimum panel length for Thrie-Beam Elements shall be 12'-6". Field drilled holes for Post connections shall be ⅞" by 2½" slotted holes.

BOLTS, NUTS AND WASHERS: Bolts, nuts and round washers shall be in accordance with AASHTO M180. Plate Washers shall be in accordance with ASTM A36 or ASTM A709 Grade 36.

COATINGS: All Nuts, Bolts, Anchors, and Washers shall be hot-dip galvanized in accordance with the Specifications.

BRIDGES ON CURVED ALIGNMENTS: The details presented herein are shown for bridges on tangent alignments. Details for bridges on horizontally curved alignments are similar.

THRIE-BEAM EXPANSION SECTION: Thrie-Beam Expansion Sections shall be installed at locations shown in the Plans. Install nuts for splice bolts finger-tight at 2½" slots in thrie-beam expansion sections. Nuts shall fully engage bolts with a minimum of one bolt thread extending beyond the nuts. Distort the first thread on the outside of the nut to prevent loosening. Tighten bolts in 3⅜" slots at guardrail post(s) that lie between the slotted expansion splice and bridge deck joint so that the bolt heads are in full contact with thrie-beam elements, but not so tight as to impede movement due to expansion.

WOOD BLOCKS: All wood blocks, including required wedge shaped blocks shall be Pressure Treated Lumber in accordance with Specifications Section 955. Bolt holes in blocks to be centered (±¼").

BRIDGE NAME PLATE: If a portion of the existing Traffic Railing is to be removed that carries the bridge name, number and or date, or if the Installation of the Traffic Railing (Thrie-Beam Retrofit) will obscure the bridge name, number and or date, then replace the information that has been removed or obscured, with 3" tall black lettering on white nonreflective sheeting applied to the top of the adjacent guardrail. The information must be clearly visible from the right side of the approaching travel lane. The sheeting and adhesive backing shall comply with Specification Section 994 and may comprise of individual decals of letters and numbers.

PAYMENT: Payment will be made under Thrie-Beam Panel Retrofit which shall include all materials and labor required to fabricate and install the retrofit railing. Transition Blocks and Curbs, Bridge Name Plate and Reflective Railing Markers, where required, will not be paid for directly but shall be considered incidental work.

THRIE-BEAM PANEL SPLICE

NOTE: All Thrie Beam Panels shall be lapped in the direction of adjacent traffic. At the Contractor's option, laps may be extended. Field drill holes in Trailing Thrie-Beam Panel as required.

PLAN VIEW

PLATE WASHER DETAIL

TYPICAL SECTION THRU CLASS B (10 GAUGE) THRIE-BEAM PANEL (EXPANSION SECTION SIMILAR)

THRIE-BEAM EXPANSION SECTION

1" WOOD BLOCK

FRONT VIEW

WEDGE SHAPED BLOCK DETAIL

⅝" OVAL SHOULDER BUTTON HEAD BOLT

L (in)	THREAD LENGTH (in)	APPLICATION
1½	Full Length	Splice Bolt
14	4	Post Bolt

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

THRIE-BEAM PANEL RETROFIT
(CONCRETE HANDRAIL)

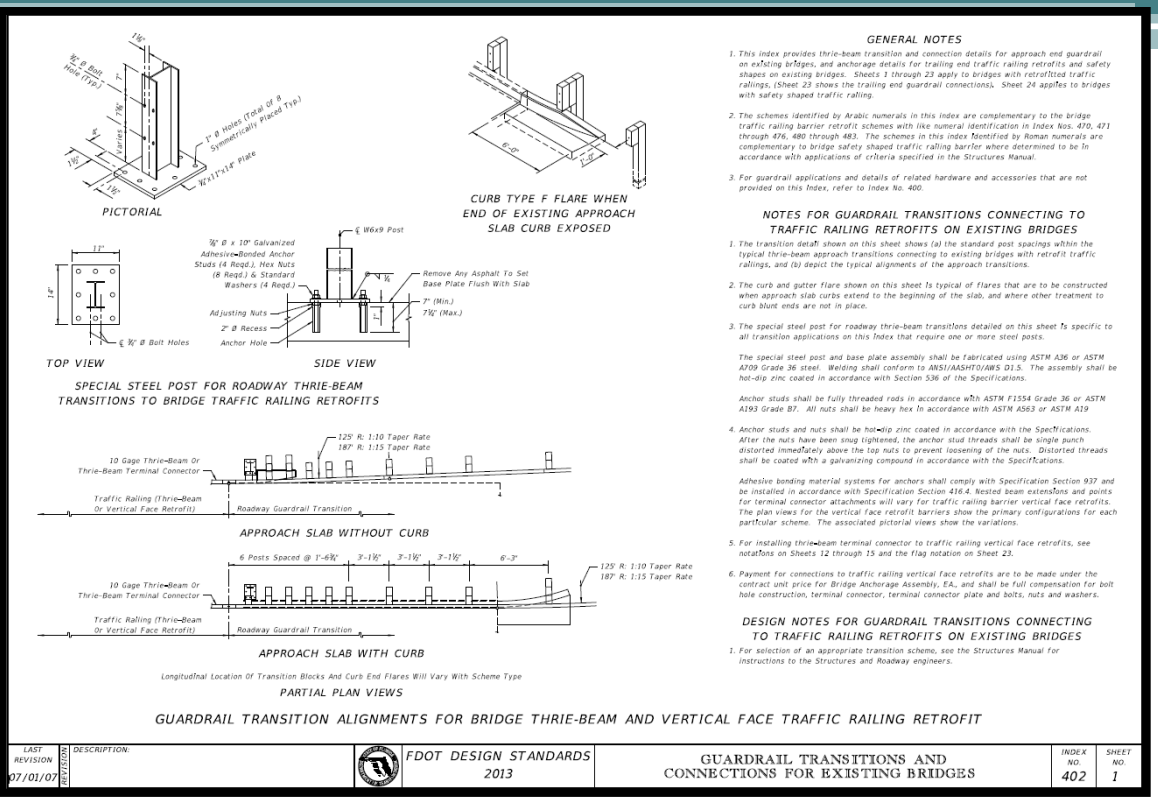
Issue Date

Sheet No. 1 of 4

Index No. D477

Index D477

- Developmental Design Standard D477 addresses continuous post & beam retrofit and transition only.



PICTORIAL

CURB TYPE F FLARE WHEN END OF EXISTING APPROACH SLAB CURB EXPOSED

TOP VIEW

SIDE VIEW

SPECIAL STEEL POST FOR ROADWAY THRIE-BEAM TRANSITIONS TO BRIDGE TRAFFIC RAILING RETROFITS

APPROACH SLAB WITHOUT CURB

APPROACH SLAB WITH CURB

Longitudinal Location Of Transition Blocks And Curb End Flares Will Vary With Scheme Type

PARTIAL PLAN VIEWS

GUARDRAIL TRANSITION ALIGNMENTS FOR BRIDGE THRIE-BEAM AND VERTICAL FACE TRAFFIC RAILING RETROFIT

GENERAL NOTES

1. This index provides thrie-beam transition and connection details for approach end guardrail on existing bridges, and anchorage details for trailing end traffic railing retrofits and safety shapes on existing bridges. Sheets 1 through 23 apply to bridges with retrofitted traffic railings (Sheet 23 shows the trailing end guardrail connections). Sheet 24 applies to bridges with safety shaped traffic railing.

2. The schemes identified by Arabic numerals in this index are complementary to the bridge traffic railing barrier retrofit schemes with like numeral identification in Index Nos. 470, 471 through 476, 480 through 483. The schemes in this index identified by Roman numerals are complementary to bridge safety shaped traffic railing barrier where determined to be in accordance with applications of criteria specified in the Structures Manual.

3. For guardrail applications and details of related hardware and accessories that are not provided on this Index, refer to Index No. 400.

NOTES FOR GUARDRAIL TRANSITIONS CONNECTING TO TRAFFIC RAILING RETROFITS ON EXISTING BRIDGES

1. The transition details shown on this sheet shows (a) the standard post spacings within the typical thrie-beam approach transitions connecting to existing bridges with retrofit traffic railings, and (b) depict the typical alignments of the approach transitions.

2. The curb and gutter flare shown on this sheet is typical of flares that are to be constructed when approach slab curbs extend to the beginning of the slab, and where other treatment to curb blunt ends are not in place.

3. The special steel post for roadway thrie-beam transitions detailed on this sheet is specific to all transition applications on this Index that require one or more steel posts.

   The special steel post and base plate assembly shall be fabricated using ASTM A36 or ASTM A709 Grade 36 steel. Welding shall conform to ANSI/AASHTO/AWS D1.5. The assembly shall be hot-dip zinc coated in accordance with Section 536 of the Specifications.

   Anchor studs shall be fully threaded rods in accordance with ASTM F1554 Grade 36 or ASTM A193 Grade B7. All nuts shall be heavy hex in accordance with ASTM A563 or ASTM A19

4. Anchor studs and nuts shall be hot-dip zinc coated in accordance with the Specifications. After the nuts have been snug tightened, the anchor stud threads shall be single punch distorted immediately above the top nuts to prevent loosening of the nuts. Distorted threads shall be coated with a galvanizing compound in accordance with the Specifications.

   Adhesive bonding material systems for anchors shall comply with Specification Section 937 and be installed in accordance with Specification Section 416-4. Nested beam extensions and points for terminal connector attachments will vary for traffic railing barrier vertical face retrofits. The plan views for the vertical face retrofit barriers show the primary configurations for each particular scheme. The associated pictorial views show the variations.

5. For installing thrie-beam terminal connector to traffic railing vertical face retrofits, see notations on Sheets 12 through 15 and the flag notation on Sheet 23.

6. Payment for connections to traffic railing vertical face retrofits are to be made under the contract unit price for Bridge Anchorage Assembly, EA., and shall be full compensation for bolt hole construction, terminal connector, terminal connector plate and bolts, nuts and washers.

DESIGN NOTES FOR GUARDRAIL TRANSITIONS CONNECTING TO TRAFFIC RAILING RETROFITS ON EXISTING BRIDGES

1. For selection of an appropriate transition scheme, see the Structures Manual for instructions to the Structures and Roadway engineers.

LAST REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS 2013	GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES	INDEX NO.	SHEET NO.
07/01/07				402	1

- Design Standard Index 402 in combination with the 470 and 480 Series can be used with almost any type of obsolete railing