**Thrie-Beam Terminal Connector**

**DESCRIPTION:**

Traffic Railing (Thrie-Beam Or Vertical Face Retrofits)

**APPROACH SLAB WITHOUT CURB**

6 Posts Spaced @ 1'-6" 3'-1" 3'-1" 3'-1" 6'-0"

10 SAE Thrie-Beam Or Thrie-Beam Terminal Connector

Traffic Railing (Thrie-Beam Or Vertical Face Retrofits)

Roadway Guardrail Transition

3'-1" 3'-1" 3'-1" 3'-1"

10 SAE Thrie-Beam Or Thrie-Beam Terminal Connector

Traffic Railing (Thrie-Beam Or Vertical Face Retrofits)

Roadway Guardrail Transition

125 R: 1:10 Taper Rate
187 R: 1:15 Taper Rate

**APPROACH SLAB WITH CURB**

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

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

1. The transition detail 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.

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.

5. For installing thrie-beam terminal connector to traffic railing vertical face retrofits, see notes 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 Instructions for Design Standards (IDS-470 & IDS-480) for instructions to the Structures and Roadway engineers.

**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 Instructions for Design Standards (IDS-410 & IDS-480).

3. For guardrail applications and details of related hardware and accessories that are not provided on this index, refer to Index No. 400.
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS
FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS
FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)

SEE INDEX NOS. 472 & 475 - SCHEMES 3 & 4

SEE INDEX NOS. 472 & 475 - SCHEMES 3 & 4

SEE INDEX NOS. 472 & 475 - SCHEMES 5 & 6

SEE INDEX NOS. 472 & 475 - SCHEMES 5 & 6
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS
FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)
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PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)

SEE INDEX NOS. 472, 473, 475 & 476 - SCHEME 1

SEE INDEX NOS. 472, 473, 475 & 476 - SCHEME 2

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.

Any Detached Or Integral Sidewalk Removed

Key Post Reference Line

Integral Approached Sidewalk With Curb
Remove Portion of Curb As Required For Post Placement.
PICTORIAL VIEWS OF GUARDRAIL APPROACH
TRANSITIONS AND CONNECTIONS FOR BRIDGE
TRAFFIC RAILING (THRIE-BEAM RETROFIT)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)

SEE INDEX NO. 474 - SCHEME 1

SEE INDEX NO. 474 - SCHEME 2

SEE INDEX NO. 474 - SCHEME 3
PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)
PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)
(INDEX 482 SHOWN, INDEX 405 SIMILAR)

Note:
"21" x 12" x 16" Thrie-Beam Terminal Connector Plate (Back-Up Plate), And 3/8" x 12" Long
HS Hex Bolts And Nuts (5 Req'd.) With 29C CD Plain Round Washers Under Heads And Nuts
SEE INDEX NOS. 405 OR 482 - SCHEME 1

SEE INDEX NOS. 405 OR 482 - SCHEME 4

SEE INDEX NOS. 405 OR 482 - SCHEME 5

PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)
(INDEX 482 SHOWN, INDEX 405 SIMILAR)
**Note:**

"21" x 12" x 3/8" Thrie-Beam Terminal Connector Plate (Back-Up Plate), and 5/8" HS Hex Bolts And Nuts (12" Long For Scheme 1 And Length To Fit For Schemes 2 And 3½ In Head) With 27½ OD Plain Round Washers Under Heads And Nuts.
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (VERTICAL FACE RETROFIT)

DESIGN STANDARDS
2016
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

INDEX NO. 402
SHEET NO. 16 OF 24

REV 07/01/14

DESCRIPTION:
GuARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

2016 DESIGN STANDARDS

INDEX NO. 402 SHEET NO. 19 of 24

PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (VERTICAL FACE RETROFIT)

(INDEX 482 SHOWN, INDEX 405 SIMILAR)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (VERTICAL FACE RETROFIT)

(INDEX 482 SHOWN, INDEX 405 SIMILAR)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS
AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING
(VERTICAL FACE RETROFIT)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS
AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING
(VERTICAL FACE RETROFIT)
NOTES FOR TRAILING END TRAFFIC RAILING VERTICAL FACE RETROFFITS

1. Where guardrail extensions are required beyond the trailing end of bridges with traffic railing vertical face retrofits, guardrail connections to the bridge railing will be by special end shoe for W-beam guardrail extensions and by thrie-beam terminal connector for thrie-beam guardrail extensions.

2. Install W-beam special end shoes and thrie-beam terminal connectors with back-up plates, and 5/8" HS hex bolts and nuts (12" long) with 2½" OD plain round washers under nuts and bolts (4 required for special end shoes and 2 required for thrie-beam terminal connectors). Back-up plates for special end shoes are 12"x12"x⅛" and for terminal connector 25½"x12½"x½".

3. Payment for connecting trailing end special end shoes and thrie-beam terminal connectors to traffic railing vertical face retrofits will be made under the contract unit price for guardrail bridge anchorage assembly, FA.

TRAILING END GUARDRAIL AND ANCHORAGE FOR BRIDGE TRAFFIC RAILING (THRIE BEAM RETROFFITS)

1. See indexes for bridge thrie-beam trailing end retrofits.

2. Trailing end guardrail to be paid for under the contract unit price for the parent roadway guardrail; end measure includes length of end anchorage assembly; additional payment made for end anchorage assembly. No additional payment for connecting roadway thrie-beam to bridge thrie-beam retrofit.

NOTES FOR TRAILING END TRAFFIC RAILING VERTICAL FACE RETROFFITS

1. Where guardrail extensions are required beyond the trailing end of bridges with traffic railing vertical face retrofits, guardrail connections to the bridge railing will be by SPECIAL END SHOE for W-beam guardrail extensions and by THRIE-BEAM TERMINAL CONNECTOR for thrie-beam guardrail extensions.

2. Install W-beam special end shoes and thrie-beam terminal connectors with back-up plates, and 5/8" HS hex bolts and nuts (12" long) with 2½" OD plain round washers under heads and nuts (4 required for special end shoes and 5 required for thrie-beam terminal connectors). Back-up plates for special end shoes are 12"x12"x⅛" and for terminal connector 25½"x12½"x½".

3. Payment for connecting trailing end special end shoes and thrie-beam terminal connectors to traffic railing vertical face retrofits will be made under the contract unit price for guardrail bridge anchorage assembly, FA.
GUARDRAIL TRANSITIONS TO EXISTING FLAT SLAB BRIDGES

Use Of Scheme I Shall Be Determined In Accordance With The Instructions For Design Standards (IDS-402).

GUARDRAIL TRANSITION TO EXISTING PRESSED BEAM OR GIRDER BRIDGES

Use Of Schemes II and III Shall Be Determined In Accordance With The Instruction For Design Standards (IDS-402).

APPRAOCH POSTS AND SPECIAL OFFSET BLOCKS

Block assemblies for special offsets can be made up of one special block plus one standard size block or of three standard size blocks field dressed to approximately equal size, with the pieces secured for relative position by 16d galvanized nails, see ‘16d NAIL FOR PREVENTION OF OFFSET BLOCK.

NOTATION – Index 400. The nested rails shall not be bolted to the blocks and posts at posts (a), (c) and (e). The details shown are for approach slabs with internal edge dike extending beyond parapet type traffic railing termini.

SHEET NO.

INDEX NO.

NOTE FOR GUARDRAIL TRANSITIONS TO SAFETY SHAPE TRAFFIC RAILINGS ON EXISTING BRIDGES

1. When the existing wing post is to be replaced with a bridge traffic railing in accordance with the Instructions For Design Standards (IDS-402), the three-beam guardrail connection shall be in accordance with Detail J of Index No. 400.

2. When the guardrail attachment overlays the Bridge Number, Bridge Name or Date on the traffic railing, provide an aluminum sign panel with the obscured information. Attach the sign panel to the face of the traffic railing adjacent to the Three-Beam Terminal Connector with 3/8" x 1" long concrete screws or expansion anchors at each corner, as approved by the Engineer. The sign panel shall be a minimum 5½" thick and meet the requirements of Specification Section 700 with a white background and 3½ tall black letters and sized appropriately to contain the information required. The cost of the sign panel shall be included in the cost of the Guardrail Bridge Anchorage Assembly.

3. When retrofitting three-beam guardrail to existing wing posts or existing bridge safety shape traffic railing, attachment construction to be paid for under the contract unit price for guardrail Bridge Anchorage Assembly, i.e., and shall be full compensation for bolt hole construction, terminal connector, terminal connector plate(s) and bolts, nuts and washers.

GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR EXISTING FLAT SLAB, PRESSED BEAM AND GIRDER BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

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