**GENERAL NOTES**

1. This index provides thrie-beam transition and connection details for approach and guardrail on existing bridges, and anchorages details for traffic and guardrail railings, and safety shapes on existing bridges. Sheets 1 through 23 apply to bridges with retrofitted traffic railings. Sheet 24 shows the trapezoidal and 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 railings barrier retrofit schemes with the numeral identification. The schemes in this Index are identified by Roman numerals to bridge safety shaped traffic railings, 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 detail shown on this sheet shows all 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 end bulks is not in place.

3. The special steel post for roadway thrie-beam transitions shown on this sheet is specific to all traffic 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 A479 Grade 36 steel. Welding shall conform to 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 A495 Grade 36. All nuts shall be heavy hex in accordance with ASTM A563 or ASTM A499. Anchor stud 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 9.37 and be installed in accordance with Specification Section 416. Nested beam extensions and points for terminal connector attachments will vary for traffic railings, vertical face retrofits. The plan views for the vertical face retrofits 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 railings vertical face retrofits, see instructions on Sheets 2 through 23 and the notes on Sheet 24.

6. Payment for connections to traffic railings vertical face retrofits are to be made under the contract price for Bridge Anchorages Assembly, E4, and shall be fully compensated 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.
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS

FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS
FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
SEE INDEX NOS. 473 & 476 - SCHEMES 5 & 6

PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS
FOR BRIDGE TRAFFIC RAILING (THRIE-BEAM RETROFIT)

SEE INDEX NOS. 473 & 476 - SCHEMES 5 & 6
PARTIAL PLAN VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS
FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (THREE-BEAM RETROFIT)
PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)
PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)

Note:
*2" x 1/2" x 12" Thrie-Beam Terminal Connector Plate (Back-Up Plate), And 3/8" Ø x 12" Long
*25 Hex Bolts And Nuts (8 Per Pk.) With 254-100 Plain Round Washers Under Heads And Nuts
PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)

Note:
- #1/4" x 12" x 3/8" Trunk-Beam Terminal Connector Plate (Back-Up Plate), And 3/8" x 12" Long
- 3/8" x 1/8" x 0.375" HDPE Spacers Under Heads And Nuts

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GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES
Sheet No. 14 of 24
SEE INDEX NO. 483 - SCHEME 1

SEE INDEX NO. 483 - SCHEME 2

SEE INDEX NO. 483 - SCHEME 3

**PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)**

Note:

- #21" x 12" x 3/4" Thrive Beam Terminal Connector Plate (Back-Up Plate), and 3/8" Ø MS Hex Bolts And Nuts (12" Long For Scheme 1 And Length To Fit For Schemes 2 and 3). (5 Req.) With 2¼" OD Plain Round Washers Under Heads And Nuts.
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)
PICTORIAL VIEWS OF GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR BRIDGE TRAFFIC RAILING (VERTICAL FACE RETROFIT)
THRIE-BEAM RETROFIT NOTES

1. Where Guardian Extensions Are Required Beyond The Trailing End Of Bridges, With Traffic Railing Vertical Face Railings, Guardian Connections To The Bridge Railing Will Be By SPECIAL END SLOTS For THREE-BEAM Guardian Extensions And By THREE-BEAM TERMINAL CONNECTORS For THREE-BEAM Guardian Extensions.


TRAILING END GUARDRAIL AND ANCHORAGE FOR BRIDGE TRAFFIC RAILING (THREE BEAM RETROFITS)
GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR EXISTING FLAT SLAB, PRESTRESSED BEAM AND GIRDER BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

1. When the existing wing post is to be replaced with a bridge traffic railing in accordance with the Structures Manual, the three-beam guardrail connection shall be in accordance with Table J of Index No. 400.

2. When retrofitting three-beam guardrails, 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, EA, and shall be full compensation for bolt hole construction, terminal connector, terminal connector plate(s) and bolts, nuts and washers.

NOTES 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 Structures Manual, the three-beam guardrail connection shall be in accordance with Table J of Index No. 400.

2. When retrofitting three-beam guardrails, 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, EA, 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, PRESTRESSED BEAM AND GIRDER BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING EXTENDING LESS THAN FULL APPROACH SLAB LENGTH