**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.

2. This index provides thrie-beam transition and connection details for approach end guardrail transitions connecting to traffic railing retrofit schemes identified by Roman numerals in Index Nos. 470, 471 through 476, 480 through 483. The schemes 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 schemes determined to be in accordance with applications of criteria specified in the Instructions for Design Standards (IDS-470 & 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.

4. For installing thrie-beam connector to traffic railing vertical face retrofits, see notations on Sheets 12 through 13 and the flag notation on Sheet 23.

5. 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.
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 5 & 6
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

SEE INDEX NOS. 473 & 476 - SCHEME 1

SEE INDEX NOS. 473 & 476 - SCHEMES 3 & 4

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

EXISTING RAILING AND RETROFIT

W-BEAM BARRIERS

THRIE-BEAM RAILING

W-BEAM TRANSITION BLOCK IN ABSENCE OF CURB

THRIE-BEAM KEY POST (THRIE-BEAM BOLTS)

THRIE-BEAM TRANSITION BLOCK IN ABSENCE OF CURB

W-BEAM TRANSITION BLOCK IN ABSENCE OF CURB

THRIE-BEAM KEY POST (THRIE-BEAM BOLTS)

PICTORIAL VIEW SEE INDEX NO. 471 - SCHEME 1

PICTORIAL VIEW SEE INDEX NO. 471 - SCHEME 2

PICTORIAL VIEW SEE INDEX NO. 471 - SCHEME 3

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

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

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

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

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)
**GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES**

**DESCRIPTION:**

- **SEE INDEX NO. 481 - SCHEME 1**
  - Front Face Of Existing Backwall & Begin Or End Existing Bridge
  - Traffic Railing (Vertical Face Retrofit) Constructed
  - Existing Railing Removed
  - Parallel Wing Post Removed, Traffic Railing (Vertical Face Retrofit) 5' Or More In Length Constructed
  - Existing Curb - See Indexes For Face Of Railing Offset

- **SEE INDEX NO. 481 - SCHEME 2**
  - Front Face Of Existing Backwall & Begin Or End Existing Bridge
  - Traffic Railing (Vertical Face Retrofit) Less Than 5' In Length Constructed
  - Parallel Wing Post Removed, Traffic Railing (Vertical Face Retrofit) Constructed
  - Existing Curb - See Indexes For Face Of Railing Offset

- **SEE INDEX NO. 481 - SCHEME 3**
  - Front Face Of Existing Backwall & Begin Or End Existing Bridge
  - Traffic Railing (Vertical Face Retrofit) Constructed
  - Parallel Wing Post Removed, Traffic Railing (Vertical Face Retrofit) Constructed
  - Existing Curb - See Indexes For Face Of Railing Offset

**Note:**

"2" x 12" x ½” Thrie-Beam Terminal Connector Plate (Back-Up Plate), And ¾" x 12" Long HS Hex Bolts And Nuts (5 Req'd.) With 2½" OD Plain Round Washers Under Heads And Nuts

**PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT)**
**GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES**

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

*INDEX 482 SHOWN, INDEX 405 SIMILAR*

**Note:**
*3/4" x 12" x 3/16" Thrie-Beam Terminal Connector Plate (Back-up Plate), 2 per pair*.
*6-3/8" Hex Bolt 2-1/8" Long (8 Req'd.)*
*2" x 12" x 2" OD Plain Round Washers Under Heads And Nuts*
PARTIAL PLAN VIEWS OF TRAFFIC RAILING (VERTICAL FACE RETROFIT) (INDEX 482 SHOWN, INDEX 405 SIMILAR)

SEE INDEX NOS. 405 OR 482 - SCHEME 1

SEE INDEX NOS. 405 OR 482 - SCHEME 4

SEE INDEX NOS. 405 OR 482 - SCHEME 5

Note:
- 3/4" x 12" x 3/4" Thrie-Beam Terminal Connector Plate (Back-Up Plate), And 5/8" x 12" Long
  1/2" Hex Bolts And Nuts (5 Req.) With 2" OD Plain Round Washers Under Heads And Nuts
GUARDRAIL TRANSITIONS AND CONNECTIONS FOR EXISTING BRIDGES

Front Face Of Existing Backwall & Begin Or End Existing Bridge

Existing Railing Removed And Traffic Railing (Vertical Face Retrofit) Constructed

Traffic Railing (Vertical Face Retrofit) Constructed

Existing Approach Slab

SEE INDEX NO. 483 - SCHEME 1

Front Face Of Existing Backwall & Begin Or End Existing Bridge

Existing Flared Wing Post Removed And Traffic Railing (Vertical Face Retrofit) Constructed

Special Steel Post For Roadway

Thrie-Beam Transitions

Edge Of Approach Slab Varies

SEE INDEX NO. 483 - SCHEME 2

Existing Railing Removed

Traffic Railing (Vertical Face Retrofit)

Existing Approach Slab

SEE INDEX NO. 483 - SCHEME 2

Front Face Of Existing Backwall & Begin Or End Existing Bridge

Existing Railing Removed And Traffic Railing (Vertical Face Retrofit) Constructed

Traffic Railing (Vertical Face Retrofit) Constructed

Existing Approach Slab

SEE INDEX NO. 483 - SCHEME 3

Front Face Of Existing Backwall & Begin Or End Existing Bridge

Existing Flared Wing Post Removed And Traffic Railing (Vertical Face Retrofit) Constructed

Special Steel Post For Roadway

Thrie-Beam Transitions

Edge Of Approach Slab Varies

SEE INDEX NO. 483 - SCHEME 3

Traffic Railing (Vertical Face Retrofit)

Existing Approach Slab

SEE INDEX NO. 483 - SCHEME 3

Note:
* 21" x 12" x ½" Thrie-Beam Terminal Connector Plate (Back-Up Plate), And ½"Ø HS Hex Bolts And Nuts (1½" Long For Scheme 1 And Length To Fit For Schemes 2 And 3) (5 Req'd.) With 2½" OD Plain Round Washers Under Heads And Nuts

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

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)
(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)
THRIE-BEAM RETROFIT NOTES

1. See indexes for bridge thrie-beam traffic railing 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.

FEATURED GUARDRAILS - FIGURE 2

NOTES FOR TRAILING END TRAFFIC RAILING VERTICAL FACE RETROFITS

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 3/8" HS Hex Bolts And Nuts (12" Long) with 2" 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"x3/16" And For Thrie-Beam Terminal Connectors 21/2"x2"x3/16".

3. Payment For Connecting Trailing End Special 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, EA.
GUARDRAIL TRANSITIONS TO EXISTING FLAT SLAB BRIDGES

SCHEME I

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

GUARDRAIL TRANSITION TO EXISTING FLAT SLAB BRIDGES

PLAN

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 Instructions For Design Standards (IDS-402), the thrie-beam guardrail connection shall be in accordance with Detail J of Index No. 400.

2. When the guardrail attachment overlaps 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 Thrie-Beam Terminal Connector with ⅝ x 1½ long concrete screws or expansion anchors at each corner, as approved by the Engineer. The sign panel shall be a minimum ⅝ thick and meet the requirements of Specification Section 709 with a white background and 3½ 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 Anchor Assembly.

3. When retrofitting thrie-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, EA., and shall be full compensation for bolt hole construction, terminal connector, terminal connector plates 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