This Traffic Railing Retrofit has been structurally evaluated to be equivalent or greater in strength to a design which has been successfully crash tested previously and approved for a NCHRP Report 350 Test Level 4 rating, except for the Tapered End Transition on Index No. 484.

CONCRETE: Concrete for the Traffic Railing (Vertical Face Retrofit), Spread Footing Approaches and replacement curb sections shall be Class IV. Concrete for Curb Transition Blocks shall be Class II (Bridge Deck).

REINFORCING STEEL: Reinforcing steel shall be ASTM A615, Grade 60, except Expansion Dowel Bar B which shall be ASTM A36 smooth round bar not dip galvanized in accordance with the Specifications.

EXPANSION SLEEVE ASSEMBLY: Pipe sleeve shall be ASTM D2241 PVC pipe, SD13.5. End Cap shall be ASTM D2446 PVC socket fitting, Schedule 40. End of Sleeve assembly at railing open joint shall be sealed with silicone to prevent concrete intrusion during railing casting. A compressible expanded polyethylene plug is required in the opposite end of the assembly for correct dowel positioning during railing casting. Correct dowel positioning is required in order to provide for thermal movement of the deck.

ADHESIVE-BONDED ANCHORS AND DOWEL: Adhesive Bonding Material Systems for Anchors and Dowels shall comply with Specification Section 937 and be installed in accordance with Specification Section 416. The field testing proof loads required by Specification Section 416 shall be 33,800 lbs. for Dowel Bars 6D on the inside face (traffic side) of the railing (1'-0" embedment) and 15,000 lbs for Dowel Bars 6D along the outside face of the traffic railing (5" min. embedment).

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

NAME, DATE AND BRIDGE NUMBER: The name and bridge number shall be placed on the Traffic Railing so as to be seen on the driver's right side when approaching the bridge. The Date shall be the year the bridge was constructed. Letters and figures may be 3" tall black print. The Name, Date and Bridge Number shall be placed on the Traffic Railing so as to be visible on the driver's right side when approaching the bridge. The Date shall be placed on the driver's right side at the spacing shown in the table below. Barrier Delineator color (white or yellow) shall match the color of the near edgeline.

ELEVATION MARKERS: Elevation Markers need not be replaced when portions of the existing traffic railing carrying existing elevational markers are removed.

BARRIER DELINERATORS: Barrier Delineators shall meet Specification Section 993. Install Barrier Delineators on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table below. Barrier Delineator color (white or yellow) shall match the color of the near edgeline.

PAYMENT: Payment under Traffic Railing (Vertical Face Retrofit) includes all materials and labor required to construct the traffic railing and incidental work as required for transition blocks, curbs, spread footing approaches, and Barrier Delineators.

Concrete:
- 9" Curb: 0.064 CY/FT
- 9" Curb: 0.003 per in. height

Reinforcing Steel:
- LB/FT: 13.27 lb/ft
- 0.10 per in. length

(Quantities are based on a 9" curb, no curb cross slope and 1'-0" embedment length of Bars 6D. If the curb height or embedment length differs from that shown, increase or decrease quantity by the given per inch increment.) See Index No. 484, Sheet 4 for Spread Footing Approach Quantities.

Dowel Bars 6D Spacing (Inside Face): 30" @ 1'-0" (Min.)
Dowel Bars 6D Spacing (Outside Face): 30" @ 1'-0" (Max.)

* Place 1" thick polystyrene blockout over limits of bridge deck expansion joint full width to the end of the Traffic Railing to allow for thermal movement. Seal forms to prevent mortar leakage into the expansion joint.

REINFORCING STEEL:
- Smooth round bar
- ASTM A615, Grade 60
- Field Bend Bars 5S to maintain Cover (Typ.)
- Field Cut Bars 6D to provide 2" cover above blockout (Typ.)

Match Deck Joint width: Bars 4C and Expansion Dowels Bars B, see Sheet 2 (Typ.)

Field Cut Bars 6D to provide 2" cover above blockout (Typ.)

Field Bend Bars 5S to maintain Cover (Typ.)

Top of Existing Curb

Polystyrene Blockout *

Existing Bridge Deck

Existing Approach Slab

PARTIAL ELEVATION OF RAILING SHOWING FINGER/SLIDING PLATE JOINT - SCHEMES 2 THRU 5
(Begin or End Bridge Shown, Intermediate Joints Similar)

PARTIAL ELEVATION OF RAILING SHOWING FINGER/SLIDING PLATE JOINT AT BEGIN OR END BRIDGE - SCHEME 1
(Guardrail Transition not shown for clarity)
CONVENTIONAL REINFORCING STEEL BENDING DIAGRAM

BILL OF REINFORCING STEEL

REINFORCING STEEL NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. The reinforcement for the railing on a retaining wall shall be the same as detailed for a bridge deck.
3. All reinforcing steel in the Vertical Face Retrofit Railing shall have a 2" minimum cover.
4. Bars 5S may be continuous or spliced at the construction joints.  Bar splices for Bars 5S shall be a minimum of 2'-0".
5. Expansion Dowel Bars B shall be ASTM A36 smooth round bar and hot-dip galvanized in accordance with the Specifications.

Open Joint Expansion Dowel Detail
(Railing Reinforcing Not Shown For Clarity)

Dowel Installation Notes:
1. Shift dowel holes to clear if the existing reinforcement is encountered.
2. See individual Standards Index Nos. 481 thru 484 for spacing of Bars 6D.

Retrofit Railing
(Vertical Face Retrofit)

TRAFFIC RAILING - (VERTICAL FACE RETROFIT)
GENERAL NOTES & DETAILS

2016 DESIGN STANDARDS

INDEX NO. 480 SHEET NO. 2 of 2

LAST REVISION 07/01/14
DESCRIPTION: TRAFFIC RAILING - (VERTICAL FACE RETROFIT)