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 521-480.

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 hot dip galvanized in accordance with the Specifications.

EXPANSION SLEEVE ASSEMBLY: Pipe sleeve shall be ASTM D2241 PVC pipe, SDR13.5. End Cap shall be ASTM D2466 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 polystyrene 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 DOWELS: 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 25,800 lbs. for Dowel Bars 6D on the inside face (traffic side) of the railing (1'-0" embedment) and 18,500 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 Indexes 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 plastic as approved by the Engineer or V-Grooves. V-Grooves shall be formed by preformed letters and figures.

ELEVATION MARKERS: Elevation Markers need not be replaced when portions of the existing traffic railing carrying existing elevation 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 railing and incidental work as required for transition blocks, curbs, spread footing approaches, and Barrier Delineators.

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

* 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.

**Match Deck Joint width**

Bars 4C and Expansion Dowels B, see Sheet 2 (Typ.)

Field Bend Bars 55 to maintain Cover (Typ.)

Dowel Bars 6D Spacing (Inside Face) 3½ @ 1½

2 sp. @ 1½

1½ (Max.)

1½ (Max.)

Dowel Bars 6D Spacing (Outside Face) 3½ @ 1½

2 sp. @ 1½

1½ (Max.)

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

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

Existing Bridge Deck

Polystyrene Blockout *

Existing Approach Slab

Field Bend Bars 55 to maintain clearance

Dowel Bars 6D Spacing (Inside Face) 3½ @ 1½

2 sp. @ 1½

1½ (Max.)

1½ (Max.)

Dowel Bars 6D Spacing (Outside Face) 3½ @ 1½

2 sp. @ 1½

1½ (Max.)

Limiting Station of Transition (See Roadway Plans)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>CYS/FT</td>
<td>0.064</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>LB/FT</td>
<td>13.27</td>
</tr>
</tbody>
</table>

(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 521-480, Sheet 4 for Spread Footing Approach Quantities.
2. The reinforcement for the railing on a retaining wall shall be ASTM A36 smooth round bar and hot-dip galvanized in accordance with the Specifications.

3. All reinforcing steel in the Vertical Face Retrofit Railing shall have a 2" minimum cover.

4. Expansion Dowel Bars B shall be ASTM A36 smooth round bar and hot-dip galvanized in accordance with the Specifications.

5. Expansion Dowel Bars B shall be a minimum of 2'-2" longer than the joint material (Silicone, poured rubber, armored neoprene seal or sliding plates) as shown to prevent concrete intrusion during railing casting and shall be placed so as not to restrict in any way normal joint movement.

** See Index 521-481 thru 521-484 for spacing of Bars 6D.

** ½ Preformed Joint Filler at top of Existing Curb shall extend beyond the joint material (Silicone, poured rubber, armored neoprene seal or sliding plates) as shown to prevent concrete intrusion during railing casting and shall be placed so as not to restrict in any way normal joint movement.

** Pin

- ** Expansion Dowel Bar B
- ** Cap & Polystyrene Plug
- ** 1" Ø PVC Pipe Sleeve, Cap & Polystyrene Plug
- ** 2½" (Shift Bars 4C to clear Bars 6D for skewed joints)

** See Index 521-481 thru 521-484 for spacing of Bars 6D.

** Hole Diameter to meet Manufacturer's Requirements

- ** Plug to match width of open joint
- ** Embedment length of Bars 6D, 4L or 4N.

** Dowel Installation Notes:
1. Shift dowel holes to clear if the existing reinforcement is encountered.
2. See Index 521-481 thru 521-484 for required embedment length of Bars 6D, 4L or 4N.

** Shift Dowel Holes to Clear

- ** Dowel Sleeve
- ** Adhesive Bonding Material System
- ** Field Cut & Discard
- ** 1" Ø PVC Pipe Sleeve, Cap & Polystyrene Plug
- ** 2½" (Shift Bars 4C to clear Bars 6D for skewed joints)

** Dowel Installation Notes:
1. Shift dowel holes to clear if the existing reinforcement is encountered.
2. See Index 521-481 thru 521-484 for required embedment length of Bars 6D, 4L or 4N.

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