This railing has been structurally evaluated to be equivalent or greater in strength to other single-slope railings which have been crash tested to NASSM TL-4 criteria.

CONCRETE AND REINFORCING STEEL: See Structures Plans, General Notes.

GUARDRAIL: For Guardrail connection details see Index 400.

SUPERELEVATED BRIDGES: At the option of the Contractor the Traffic Railing on super-elevated bridges may be constructed perpendicular to the roadway surface. If an adjoining railing is constructed plumb, transition the end of the Traffic Railing from perpendicular to plumb over a minimum distance of 20'-0". The cost of all modifications will be at the Contractor's expense.

BARRIER DELINEATORS: Barrier Delineators shall meet Specification Section 993. Install Barrier Delineators only on the Traffic Railing along the centerline at the spacing shown in the table above. Barrier Delineator color (white or yellow) shall match the color of the near edgeline. The cost of the Barrier Delineators shall be included in the Contract Unit Price for the Traffic Railing.

V-GROOVES: Construct ½" V-Grooves plumb. Space V-Grooves equally between ½" open joints and/or Deck Joints.

JOINTS: See Plans, Superstructure, Approach Slab and Retaining Walls Sheets for actual dimensions and joint orientation. Provide open Railing Joints at Deck Expansion Joint locations matching the dimensions of the Deck Joint. For treatment of Railings on skewed bridges see Sheet No. 3. Provide ½" Intermediate Open Joints at:

(1) - Superstructure supports where slab is continuous.

END TRANSITION: When guardrail approaches are shown in the Plans, provide the tapered end transition as shown. When a Concrete Traffic Railing or Median Barrier Wall is shown on the approaches see the Structures Plans for the End Transition Details.

The cost of all modifications will be at the Contractor's expense.

BARRIER DELINEATOR SPACING

<table>
<thead>
<tr>
<th>Distance - Edge of Travel Lane to Face of Railing</th>
<th>Spacing (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4</td>
<td>40'</td>
</tr>
<tr>
<td>4&quot; to 8&quot;</td>
<td>60'</td>
</tr>
<tr>
<td>&gt; than 8&quot;</td>
<td>None Required</td>
</tr>
</tbody>
</table>

CROSS REFERENCE:

For Section A-A, View B-B and Detail "A" see Sheet 2.
For Detail "B" see Sheet 4.
SECTION A-A
TYPICAL SECTION THRU TRAFFIC RAILING
(SECTION THRU BRIDGE DECK SHOWN -
SECTION THRU APPROACH SLAB SIMILAR)

NOTE:
Begin placing Railing Bars 5R and 5W on Approach Slab at the
railing end and proceed toward Begin or End Bridge to ensure
placement of guardrail bolt holes. If required, adjustments to the
bar spacing for Bars 5R and 5W shall be made immediately
adjacent to Begin or End Bridge. Shift and rotate Bars 5R and 5W
as required to maintain cover in Railing End Transition.

See the Structures Plans for Special End Transition details, if Index
410 Concrete Barrier Wall is used beyond the Approach Slab. See
Structures Plans, Plan and Elevation Sheet and Roadway Plans.
PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB WITH MEDIAN TRAFFIC RAILING

NOTES:
1) Median Traffic Railing reinforcement vertical Bars SW may be shifted up to 1" (Max.) and rotated up to 10 degrees as required to allow proper placement.

2) Transition Stirrup Bars SW shall be used as required at railing ends adjacent to expansion joints to facilitate placement of bars in acute corners. Place Transition Bars SW in a fan pattern to maintain spacing. Rotate bars in 10° (Max.) increments as required.

3) Median Traffic Railing ends at deck expansion joints shall follow the deck joint with allowance for joint movement. See Structures Plans, Superstructure and Approach Slab Sheets for Details.

4) 1/2" Intermediate Open Joints and V-Grooves in railing shall be placed perpendicular or radial to the joint of the median railing. See Structures Plans, Superstructure and Approach Slab Sheets for locations.

5) At begin or end approach slab extend slab at the median railing ends 3' (open side) as shown to provide a base for casting of the railing.

6) Work this Sheet with Approach Slab Indexes as applicable.

7) Deck Expansion Joint at begin or end bridge shown. Deck Expansion Joints at Pier or Intermediate Bents are similar.

8) Partial Plan Views shown are intended as guides only. See Structures Plans, Superstructure and Approach Slab Sheets for skew angles, joint orientation, dimensions and details.

9) If Welded Wire Reinforcement is used in lieu of conventional reinforcement, placement of the WWR vertical elements shall be similar to those shown above. Clipping of horizontal elements to facilitate placement shall be minimized where possible. Where clipping is required, supplement horizontal elements by lap splicing with deformed bars having an equivalent area of steel.
The above quantities are based on a crowned roadway, with a 2% cross slope.

Reinforcing Steel
Concrete

<table>
<thead>
<tr>
<th>UNIT</th>
<th>QUANTITY</th>
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<tbody>
<tr>
<td>Concrete</td>
<td>0.159</td>
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<tr>
<td>Reinforcing Steel</td>
<td>23.99</td>
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</tbody>
</table>

(The above quantities are based on a crowned roadway, with a 2% cross slope.)

**Conventional Reinforcing Steel Bending Diagrams**

**Bill of Reinforcing Steel**

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>5</td>
<td>7'-2&quot;</td>
</tr>
<tr>
<td>S</td>
<td>5</td>
<td>As Req'd</td>
</tr>
</tbody>
</table>

Length as Required

**Estimated Traffic Railing Quantities**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>CY/LF</td>
<td>0.159</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>LB/LF</td>
<td>23.99</td>
</tr>
</tbody>
</table>

Pre-cured Silicone Sealant 4" wide (Typ.)

Optional Splice (see Note 4)

Field Cut & Discard

Field Cut & Reuse

Field Cut & Rouse

Optional Splice (see Note 4)

**Intermediate Joint Seal Notes:**

1. At Intermediate Open Joints, seal the lower 6" portion of the open joint with Pre-cured Silicone Sealant in accordance with Specification Section 932.
2. Apply sealant prior to any Class V finish coating and remove all curing compound and loose material from the surface prior to application of bonding agent.
3. Include the cost of the Pre-cured Silicone Sealant in the Contract Unit Price for the Traffic Railing.

**Splice Detail**

(See Note 2)

**Welded Wire Reinforcement Notes:**

1. At the option of the Contractor deformed Welded Wire Reinforcement (WWR) may be utilized in lieu of all Bars 5R, 5S and 5W. WWR must meet the requirements of Specification Section 931.
2. WWR at Railing End Transition shall be field bent (ward as required) to maintain cover. The bottom of Piece 1 shall be cut to allow overlap.
3. Place WWR panels so as to minimize the end overhang of longitudinal wires at Railing Ends and Open Joints. Overhangs greater than 6" are not permitted.

**Splice Detail (Between WWR Sections)**

**Transition Stirrup Bar 5R**

**Transition Stirrup Bar 5W**

**Welded Wire Reinforcement (WWR) Details**

**CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS**

**Stirrup Bar 5W**

**Stirrup Bar 5R**

**Field Bend as required to maintain cover**

**Field Cut & Discard**

**Field Cut & Reuse**

**Field Cut & Rouse**

**Optional Splice (see Note 4)**

**Transition Stirrup Bar 5W**

**Transition Stirrup Bar 5W**

**To Be Field Cut (10 required per Railing End Transition)**

**To Be Field Cut & Discard (10 required per Railing End Transition)**

**To Be Field Cut & Reuse (10 required per Railing End Transition)**

**To Be Field Cut & Rouse (10 required per Railing End Transition)**

**REINFORCING STEEL NOTES:**

1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints shall have a 2" minimum cover.
3. Bars 5S may be continuous or spliced at the construction joints. Bar splices for Bars 5S shall be a minimum of 2'-2".
4. At the Contractor's option, Bars 5W may be fabricated as two piece bar with a 1'-2" lap splice of the bottom legs.