PLAN OF RAILING WITH GUARDRAIL ON APPROACH SLAB WITHOUT SIDEWALK (APPROACH SLAB WITH ADJACENT SIDEWALK SIMILAR) (Reinforcing Steel Not Shown For Clarity) ** Begin placing railing bars T91 or T92 and 4V on Approach Slab at the barrier end and proceed toward Begin or End Bridge to ensure placement of guardrail bolt holes. If required, adjustments to the bar spacing for bars T91 or T92 and 4V shall be made immediately adjacent to Begin or End Bridge.

ELEVATION OF INSIDE FACE OF RAILING WITH GUARDRAIL ON APPROACH SLABS 40°-0" OR LESS ALONG GUTTER (WITHOUT CURB SHOWN, WITH CURB SIMILAR) Approach Slabs greater than 40°-0" (Measured Along Gutter Line)

ELEVATION OF INSIDE FACE OF RAILING WITH GUARDRAIL ON APPROACH SLABS GREATER THAN 40°-0" ALONG GUTTER (WITHOUT CURB SHOWN, WITH CURB SIMILAR)

SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

NOTES:
(NF) means Near Face. (PF) means Far Face.
CROSS REFERENCES:
For Sections see Sheets 3 and 4. For Quantities and Quantity Breakdown see Sheet 5.
**Partial Plan View of Bridge Deck and Approach Slab**

*(End Post Shown, Interior Post Similar)*

(Bars H, S, and T not shown for clarity)

**Notes:**
1. Shift deck and approach slab transverse reinforcement minimum to allow placement of Bars 7F and 4V.
2. For decks to 85" in place Bars 7F and 4V with the bottom mat of reinforcement as shown in Section A-A. For decks and slabs thicker than 85" place Bars 7F and 4V with 6" embedment. At skewed joints, place Bars 7F and 4V with 5" embedment.

**Typical Sections Thru Railing (Bridge Deck Shown, Approach Slab Similar)**

**Section A-A (With Curb Shown, Without Curb Similar)**

**Section B-B (With Curb Shown, Without Curb Similar)**

**Section C-C**

**Section D-D**

**End View D-D**

**Typical Sections Thru Railing End Sections on Approach Slab With Guardrail**

(Approach Slab (Flexible Pavement Approaches) Shown, Approach Slab (Rigid Pavement Approaches) Similar)

Traffic Railing - (Corral Shape)
CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>LENGTH</th>
<th>LB/BAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>7</td>
<td>4'-4&quot;</td>
<td>10.00</td>
</tr>
<tr>
<td>P2</td>
<td>7</td>
<td>4'-3&quot;</td>
<td>14.82</td>
</tr>
<tr>
<td>P3</td>
<td>7</td>
<td>4'-2&quot;</td>
<td>14.65</td>
</tr>
<tr>
<td>P4</td>
<td>7</td>
<td>4'-1&quot;</td>
<td>14.82</td>
</tr>
<tr>
<td>P5</td>
<td>6</td>
<td>2'-11&quot;</td>
<td>19.84</td>
</tr>
<tr>
<td>R1</td>
<td>5</td>
<td>As Req'd</td>
<td>1.04</td>
</tr>
<tr>
<td>R2</td>
<td>4</td>
<td>As Req'd</td>
<td>0.67</td>
</tr>
<tr>
<td>S1</td>
<td>5</td>
<td>3'-6&quot;</td>
<td>3.34</td>
</tr>
<tr>
<td>S2</td>
<td>4</td>
<td>Varies</td>
<td>4.63</td>
</tr>
<tr>
<td>S3</td>
<td>4</td>
<td>11'-3&quot;</td>
<td>7.52</td>
</tr>
<tr>
<td>T</td>
<td>4</td>
<td>11'-4&quot;</td>
<td>17.02</td>
</tr>
<tr>
<td>V1</td>
<td>5</td>
<td>2'-2&quot;</td>
<td>2.12</td>
</tr>
<tr>
<td>V2</td>
<td>4</td>
<td>2'-4&quot;</td>
<td>2.34</td>
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* Bars 4P1, 5P2, 4R1, and 4R2 are to be used with a curb only.
* Bend Bars 4S1, 4S2, and 4S3 around a M3 Stirrup Rod.
* Bars 4T1 and 4V1 are to be used on CDP Concrete Retaining Walls.

REINFORCING STEEL NOTES:

1. All dimensions in the bending diagrams are to scale.
2. The reinforcement for the railing on a CDP Concrete Retaining Wall shall be the same as detailed above for a 48" deck with QA at 90°, where applicable. All horizontal bars of Bars 7P1, 7P3, and 4V1 prohibit placement, Bars 7P4 and 4V2 may be substituted for Bars 7P1, 7P3, and 4V1 as shown.
3. All reinforcing steel at the open joints shall have a 2" minimum cover unless otherwise noted.
4. All construction joints Bars 6R1, 5R2, and 4R3 may be continuous or spliced, where bars are spliced provide a 2'-6" min. lap length for Bar 5R1, a 2'-0" min. lap length for Bars 5R2 and 4R3, and a 1'-0" min. lap length for Bars 4R3.
5. The skew angle for Bars 7P1 may vary from joint to joint and side to side, see Structures Plans, Superstructure Sheets for details.

ROADWAY OR SIDEWALK CROSS-SLOPE: 2% 5%

HIGH SIDE |
LOW SIDE |

| ROA  | 2% to 24 | 90° | 90° |
| 5%   | 24 to 64 | 92° | 87° |
| 6%   | 64 to 120| 96° | 84° |

Estimation of the length of each piece of reinforcing steel needed for the project.

ESTIMATED TRAFFIC RAILING QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>CONCRETE QUANTITY (CY)</th>
<th>REBAR QUANTITY (LB)</th>
</tr>
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<tbody>
<tr>
<td>Typical 1/2ʺ Section w/Curb</td>
<td>0.14</td>
<td>44</td>
</tr>
<tr>
<td>Typical 1/2ʺ Section w/o Curb</td>
<td>1.05</td>
<td>428</td>
</tr>
</tbody>
</table>

Bar 7P4 ***

Bar 7P3 (Requires 3-Dimensional Bend)

Bar 4P5 #

Bar 4V1

Bar 4V2 ***

Bar 7P1

Bar 7P2

Bar 7P4 ***

Bar 4S1, 4S2, 4S3 Stirrup Bar 4S1

Bar 4S2 Stirrup Bar 4S2

Bar 4T1, 4V1 Stirrup Bar 4T1

Bar 4V1, 4V2 Stirrup Bar 4V1

Bar 4V2 Stirrup Bar 4V2

Bar 4P5 Stirrup Bar 4P5

Bar 5U Stirrup Bar 5U

Bar 6T Stirrup Bar 6T

2008 FDOT Design Standards

TRAFFIC RAILING - (CORRAL SHAPE)
PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB WITH SIDEWALK
- SKEW ANGLE GREATER THAN 15 DEGREES

NOTES:
1. Railing ends at deck expansion joints shall follow the deck joint with allowance for joint movement. Expansion joint at the inside face of parapet shall be turned perpendicular or radial to this line. See Structures Plans, Superstructure and Approach Slab Sheets for details.
2. Bars 4V2 (not shown) shall be placed perpendicular or radial to the gutter.
3. Edges of Approach Slab adjacent to the roadway shall follow end of railing. Bars 7V at end of the railing shall be cut and shifted to maintain clearance, see details below. All other bars to be placed perpendicular or radial to the gutter.
4. Approach Slab reinforcement shall be placed to match bridge deck reinforcement. Steel deck transverse reinforcement shall be placed to match bridge deck reinforcement. Steel deck transverse reinforcement shall be placed to match bridge deck reinforcement.
5. Railing End Post reinforcement detailed above. Railing Interior Post reinforcement similar.

PARTIAL PLAN VIEW AT BEGIN OR END APPROACH SLAB WITH SIDEWALK AND RAILING WITH GUARDRAIL ATTACHED
- SKEW ANGLE GREATER THAN 15 DEGREES SHOWN, 15 DEGREES OR LESS SIMILAR

NOTES:
1. Railing ends at deck expansion joints shall follow the deck joint with allowance for joint movement. Expansion joint at the inside face of parapet shall be turned perpendicular or radial to this line. See Structures Plans, Superstructure and Approach Slab Sheets for details.
2. Bars 4V2 (not shown) shall be placed perpendicular or radial to the gutter. Approach Slab reinforcement shall be placed perpendicular or radial to the gutter. Approach Slab reinforcement shall be placed perpendicular or radial to the gutter.
3. Deck transverse reinforcement may be shifted minimally as required to allow proper placement of Bars 7V at 4V and to facilitate placement of concrete. Bars 4V2 and 4V1 shall be placed on the opposite sides of the joint depending on the direction of the skew, see details above. Approach Slab reinforcement may be shifted if conflicts occur.
4. Interior Post - alternate Bars 7V1 with Bars 7V2 and reverse direction of every other Bar 4V2 to facilitate placement of concrete.
5. End Post - alternate Bars 7V1 with Bars 7V2 and reverse direction of Bars 4V1 as detailed where possible.
6. Use Bars 7V2 and reverse direction of Bars 4V1 where skew restricts use of Bars 7V1 at 4V and 4V2.
7. Begin placing Railing Bars 7V at 4V on Approach Slab at the railing end and proceed toward Begin or End Bridge to ensure placement of guardrail holes. If required, adjustments to the bar spacing for Bars 7V at 4V shall be made immediately adjacent to Begin or End Bridge.