**Alternate Reinforcing (Welded Wire Reinforcement) Details**

**Conventional Reinforcing Steel Bending Diagrams**

**_bill of reinforcing steel**

**Mark** | **Size** | **Length**
--- | --- | ---
4 | 2'-0" | As Req.

**Splice detail (between WWR sections)**

**Welded Wire Reinforcement (WWR)**

**Curb Reinforcing Steel Notes**
1. All bar dimensions in the bending diagrams are cut to cut.
2. The reinforcement for the curb on a retaining wall shall be the same as detailed for an 8" deck.
3. All reinforcing steel at the open joints shall have a 2" minimum cover.
4. Bars 45 shall be a minimum of 1'-9".
5. At the option of the Contractor Welded Wire Reinforcement (WWR) may be used in lieu of all Bars 4P and 4S. WWR must consist of Deformed wire meeting the requirements of Specification Section 931.

**Estimated Concrete Curb Quantities (Scheme 2)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>CF/ft</td>
<td>0.0024</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>LB/ft</td>
<td>4.01</td>
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</tbody>
</table>

**Scheme 1 - Bottle Guard Detail**

**Typical Section Through Bottom Rail**

**Scheme 3 - Bottle Guard Detail**

**Scheme 3 - Side-Mounted Support Bracket Details**

**Cross Reference**
See Sheet 3 for Bridge Railing Notes.
**ROUND RAILS - TOP RAIL OR HANDRAIL**
- 1/8" Ø x 3/8" Pan Head Stainless Steel (Type 316 or 18-8 Alloy)
- Set Screws along outside face of railing. Set screws must be set flush against the rail surface. A 3/8" plug weld may be substituted for the two set screws at expansion joints.
- Embedded length may be 4" for plug welded connection.
- Increase handrail sleeve embedded to 8" for Expansion Joint openings greater than 2".
- Expansion Joint opening shall match the clear opening in the deck joint but not greater than 3".

**SQUARE RAILS - INTERMEDIATE OR BOTTOM RAIL**
- 1/2" Ø x 1/2" Pan Head Stainless Steel (Type 316 or 18-8 Alloy)
- Set Screws along outside face of railing. Set screws must be set flush against the rail surface. A 3/8" plug weld may be substituted for the two set screws at expansion joints.
- Embedded length may be 4" for plug welded connection.
- Increase handrail sleeve embedded to 8" for Expansion Joint openings greater than 2".
- Expansion Joint opening shall match the clear opening in the deck joint but not greater than 3".

**DETAIL "B" EXPANSION JOINT (FIELD SPlice SIMILAR)**

**BRIDGE RAILING NOTES:**

**APPLICABILITY NOTE:** Railing is limited to use on bridges with an expansion joint thermal movements not exceeding 5". Scheme 3 is limited to bridge retrofit applications where additional sidewalk width is required.

**RAILING DETAILS:** For Railing fabrication and installation details and notes see Index No. 850, except that railing shall be fabricated and installed normal to the Profile Grade Longitudinally and transversely, unless otherwise shown in the Contract Plans.

**BOTTLE-GUARD (Schemes 1 & 3):** L-Shape shall be in accordance with ASTM A36.

**CONCRETE CURB (Scheme 2):** Construct concrete curb vertical with the top surface finished level transversely. Concrete class shall be the same as the bridge deck.

**SIDE MOUNTED SUPPORT BRACKET (Scheme 3):** L-Shape and Stiffener Plate shall be in accordance with ASTM A36. Welding shall be in accordance with the American Society of Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). Weld metal shall be E60XX or E70XX. Nondestructive testing of welds is not required. The bracket shall be hot-dip galvanized after fabrication in accordance with Specification Section 962.

**PAYMENT:** Railing shall be paid per linear foot (Item No. 515-2-abb) for the steel railing and include the cost of support brackets (Scheme 3). Concrete reinforcing steel quantities for the concrete curb (Scheme 2), will be included in the bridge deck plan quantity pay items. Payment will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, pickets, rail splice assembly, base plates, bottle-guards, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the railing.