1. **Construction Requirements**: Construct the Trench Footing and expansion joints plumb; do not construct the Trench Footing perpendicular to the roadway surface.

2. **Concrete**: Use Class II concrete for slightly aggressive environments. Use Class VI concrete for moderately or extremely aggressive environments. Concrete will be in accordance with Specification Section 396.

3. **Dowels**: Dowel Load Transfer Devices will be high-density galvanized ASTM A36 smooth round bar or GFRP smooth round bars with a minimum shear strength of 22 ksi in accordance with ASTM C7617. Install Dowel Load Transfer Devices in accordance with Specification Section 350.

4. **Conduct**: Expand joint plumb and perpendicular to the Gutter Line. Provide a 90°-0' maximum interval as shown.

5. **Shear Keys**: In footing are required when GFRP bars are used for Dowel Transfer Devices and are optional with steel dowel bars. Torque Slope of Shear Key must be constant and between 3° to 45° from the transverse vertical plane.

6. **Concrete**: Provide at 90'-0' maximum intervals as shown. Space V-Grooves equally between Expansion Joints and/or Begin or End Trench Footing. V-Groove locations are to coincide with V-Groove locations in the Railing/Noise Wall.

7. **Fill Requirements**: Fill is equally required between Expansion Joints and/or Begin or End Trench Footing. V-Groove locations are to coincide with V-Groove locations in the Railing/Noise Wall.

8. **Match Cross Slope of Travel Lane or Shoulder**.

9. **Spacing**: Is shown along the Gutter Line.

10. **Work this Standard Drawing with one or both of the following**:
    a. Index 5211 - Traffic Railing/Noise Wall (14'-0').
    b. Index 3911 - Traffic Railing/Noise Wall (14'-0').

---

**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>A (8'-0' NW)</td>
<td>5</td>
<td>8'-1'</td>
</tr>
<tr>
<td>A (14'-0' NW)</td>
<td>5</td>
<td>8'-1'</td>
</tr>
<tr>
<td>B</td>
<td>AS REQ.</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>5</td>
<td>4'-3'</td>
</tr>
<tr>
<td>V</td>
<td>3</td>
<td>5'-3'</td>
</tr>
</tbody>
</table>

**Dowel**

Length as Required: 2'-0'

**BAR 5B**

1' Ø Smooth Bar: 2'-0'

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**Reinforcing Steel Notes**

1. All dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints will have a minimum cover.
3. Lap splices Bars 5B will be a minimum of 2'-2".
4. Lap splices Bars 5T and 5V will be a minimum cover.
5. The Contractor may use Welded Wire Reinforcement (WWR) when approved by the Engineer. WWR must consist of Deformed Wire meeting the requirements of Specification Section 393.

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**Estimated Trench Footing Quantities**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (Typical)</td>
<td>CF/FT</td>
<td>0.336</td>
</tr>
<tr>
<td>Reinforcing Steel (Typical)</td>
<td>LB/FT</td>
<td>56.84</td>
</tr>
<tr>
<td>Additional Rein. @ Expansion Joint</td>
<td>LB</td>
<td>21.36</td>
</tr>
<tr>
<td>3/8&quot; V-Groove (Typ.)</td>
<td>(See Typical Section and Note 3)</td>
<td></td>
</tr>
<tr>
<td>3/8&quot; Expansion Joint Filler</td>
<td>(Subtract 1269 lb/ft from typical reinforcing steel quantity shown on Index No. 5210 to account for the absence of Stirrup Bars 5V and 5A in Trench Footings.)</td>
<td></td>
</tr>
</tbody>
</table>

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**EXPANSION JOINT DETAIL**

(Trench Footing expansion joints are required at 3/8" open joints in Traffic Railing/Noise Wall)

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**TYPICAL SECTION THRU TRENCH FOOTING**

(Bars 5P, 5R and 5S in Traffic Railing Barrier/Noise Wall not shown for clarity)