7. Provide and install Preformed Expansion Joint Filler in accordance with Specification Section 932.

8. Construct 1/2" V-Grooves in junction slabs and C-I-P copings at 30'-0" maximum intervals as shown.

9. Shoulder or Roadway Pavement is required on top of the junction slab for its entire length on the traffic side of the Traffic Railing. See Typical Sections on Sheet Nos. 2 and 3 for details.

10. Spacing shown is along the Gutter Line.

11. For Precast Coping only, provide Dowel Bars 4D embedded 1'-0" and extend 9" above the top of MSE wall panels. Field cut as necessary to maintain 2" minimum cover to the top of buildup concrete. See Wall Company Drawings for number and spacing of Dowel Bars 4D.

12. Work this Index with the following:
   - Drawings for number and spacing of Dowel Bars 4D.

13. The following Indexes contain details of the intersection of the retaining wall at approach slabs:
   - Index 425 - Traffic Railing - (42" F-Shape).
   - Index 420 - Traffic Railing - (32" F-Shape)

JUNCTION SLAB NOTES:
1. When a 42" F-Shape Traffic Railing is used with precast copings, provide Bars 3D @ 8" spacing between Bars 5C within 6'-0" of Expansion Joints.
2. Construct the expansion joints, V-Grooves and face of coping plumb.
3. Provide Class III concrete for slightly aggressive environments or Class IV for moderate or extremely aggressive environments.
4. Dowel Load Transfer Devices will be hot-dip galvanized ASTM A 36 smooth round bar, or GFRP smooth round bars with a minimum shear strength of 22 ksi in accordance with ASTM D7617. Install Dowel Load Transfer Devices in accordance with Specification Section 350.
5. Construct 1/2" Expansion Joints in junction slabs and C-I-P copings plum and perpendicular or radial to the Gutter Line. See Note 4 for 29'-0" maximum intervals as shown. Provide 3"x3" Mortar plugs in open joints at the base of traffic railings to contain runoff.
6. Shear Keys in junction Slab are required when GFRP bars are used for Dowel Transfer Devices and are optional with steel dowel bars. Torque Slope on Shear Key must be consistent and between 3° to 45° from horizontal.
7. Provide and install Preformed Expansion Joint Filler in accordance with Specification Section 932.
8. Construct 1/2" V-Grooves in junction slabs and C-I-P copings at 30'-0" maximum intervals as shown.
9. Shoulder or Roadway Pavement is required on top of the junction slab for its entire length on the traffic side of the Traffic Railing. See Typical Sections on Sheet Nos. 2 and 3 for details.
10. Spacing shown is along the Gutter Line.
11. For Precast Coping only, provide Dowel Bars 4D embedded 1'-0" and extend 9" above the top of MSE wall panels. Field cut as necessary to maintain 2" minimum cover to the top of the buildup concrete. See Wall Company Drawings for number and spacing of Dowel Bars 4D.
12. Work this Index with the following:
   - Drawings for number and spacing of Dowel Bars 4D.

13. The following Indexes contain details of the intersection of the retaining wall at approach slabs:
   - Index 425 - Traffic Railing - (42" F-Shape).
   - Index 420 - Traffic Railing - (32" F-Shape)

CROSS REFERENCE: For Detail 'A', see Sheet 2.
PARTIAL END VIEW OF TRAFFIC RAILING END TRANSITION FOR GUARDRAIL ATTACHMENT
(Showing Precast Coping Only)
(Precast Coping Shown, C-I-P Coping Similar)

NOTE: See Index No. 420 and Index No. 425, Detail "A" for details.

ESTIMATED QUANTITIES FOR Precast Coping

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (Precast Coping Only)</td>
<td>CY/LF</td>
<td>0.083</td>
</tr>
<tr>
<td>Concrete (Precast Barrier &amp; Coping)</td>
<td>CY/LF</td>
<td>0.169</td>
</tr>
<tr>
<td>Concrete (C-I-P Junction Slab)</td>
<td>CY/LF</td>
<td>0.185</td>
</tr>
<tr>
<td>Reinforcing Steel (Precast Coping &amp; Traffic Railing)</td>
<td>LB/LF</td>
<td>52.67</td>
</tr>
<tr>
<td>Reinforcing Steel (C-I-P Junction Slab)</td>
<td>LB/LF</td>
<td>12.52</td>
</tr>
<tr>
<td>Additional Rein. @ Expansion Joints (Steel Dowels)</td>
<td>LB</td>
<td>21.36</td>
</tr>
</tbody>
</table>

(The above concrete quantities are based on a max. super elevation of 6.25% and a 32" F-Shape Traffic Railing.)

NOTES:
1. Match Cross Slope of Travel Lane or Shoulder.
2. Vary Junction Slab slope based on roadway cross slope to maintain a minimum 6" asphalt depth at the edge of the slab as shown.
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing. Complete details, including reinforcement lengths are required in the Shop Drawings. Provide mechanical couplers in accordance with Specification Section 415. Mechanical couplers shall develop 125% of the bar yield strength.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab completion. In the Shop Drawings, show reinforcement for optional extension required for stability, shipping and handling. Maintain 2" minimum concrete cover.
7. When the air gap between the precast coping extension and retaining wall exceeds 2½", fill gap with full depth Expanded Polystyrene to provide a maximum 2½" air gap.
8. Angle varies - 0° min., 20° max.
REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>PRECAST COPING &amp; 32&quot; F-SHAPE</th>
<th>COPING</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>5'-7&quot; 8'-0&quot; 5'-9&quot;</td>
<td>C-I-P</td>
</tr>
<tr>
<td>B1</td>
<td>5</td>
<td>11'-6&quot; N/A 9'-6&quot;</td>
<td>3-1/8</td>
</tr>
<tr>
<td>B2</td>
<td>5</td>
<td>AS REQD. AS REQD. AS REQD.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>5</td>
<td>8'-0&quot; 4'-8&quot; 4'-8&quot;</td>
<td></td>
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<tr>
<td>D</td>
<td>3</td>
<td>4'-8&quot; 4'-8&quot; 4'-8&quot;</td>
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<td>F</td>
<td>5</td>
<td>6'-8&quot; 6'-8&quot; 4'-8&quot;</td>
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<tr>
<td>S</td>
<td>5</td>
<td>11'-6&quot; AS REQD. 9'-6&quot;</td>
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</tr>
<tr>
<td>S1</td>
<td>8</td>
<td>N/A</td>
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</tr>
<tr>
<td>S2</td>
<td>8</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>5</td>
<td>5'-10&quot; 5'-10&quot; 5'-10&quot;</td>
<td></td>
</tr>
</tbody>
</table>

STIRRUP BAR 4N

STIRRUP BAR 5P

STIRRUP BAR 4N

STIRRUP BAR 5V2

NOTES:
1. Match Cross Slope of Travel Lane or Shoulder.
2. Vary the Junction Slab slope based on the roadway cross slope to maintain a minimum 6" asphalt depth at the edge of the slab.
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finish grade.
4. Minimum length of Junction Slab between expansion joints is 30'-0" for finish grade.
5. See Index No. 420 & 425 for additional Traffic Railing Details.
6. Contractor to construct stability of precast coping prior to junction slab completion. In the Shop Drawings, show reinforcement for optional extension required for stability, shipping and handling. Maintain 2" minimum concrete cover.
7. When the air gap between the precast coping extension and retaining wall extends 25", fill gap with full depth Expanded Polystyrene to provide a maximum 20" air gap.
8. Angle varies - 0° min., 20° max.
9. If slip forming is used, submit shop drawings for approval showing 3" side cover with the typical section dimensions adjusted.

F-SHAPE TRAFFIC RAILINGS

ESTIMATED QUANTITIES FOR C-I-P COPING

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (Traffic Railing not included)</td>
<td>CY/LF</td>
<td>0.268</td>
</tr>
<tr>
<td>Reinforcing Steel (Typical) excluding Bars 5V2 and 5S (Typ.)</td>
<td>LB/LF</td>
<td>31.72</td>
</tr>
<tr>
<td>Additional Rein. @ Expansion Joint (Steel Dowels)</td>
<td>LB/LF</td>
<td>21.36</td>
</tr>
</tbody>
</table>

(The above concrete quantities are based on a max. superimposition of 6.25%, beneath a 32" F-Shape Traffic Railing on an MSE Wall).
**REVISION NO.**

**INDEX NO.**

**DESCRIPTION:**

**PARTIAL PLAN VIEW OF GUARDRAIL TRANSITION AT BEGIN OR END RETAINING WALL**

(Precast Coping shown, C-I-P Coping similar)

(Traffic Railing reinforcement not shown, except for Bars 7P1 & 4V1)

**PARTIAL PLAN VIEW OF COPING WITH CURB**

(Precast Coping shown, C-I-P Coping similar)

(Traffic Railing reinforcement not shown, except for Bars 4P5, 4R3, 7P1 & 4V1)

**CORRAL SHAPE TRAFFIC RAILINGS**

**WALL COPING WITH TRAFFIC RAILING/JUNCTION SLAB**

**FY 2017-18**

**DESIGN STANDARDS**

**INDEX NO.**

**SHEET NO.**

**REV NO.**

**LAST REVIEW NO.**

**DESCRIPTION:**

- **4 - Bars 5F** (Top of Slab) (Required only when Junction Slab is skewed)
- **Approach Slab** (See Note 12 Sheet 1)
- **Begin or End Approach Slab**
  - 3/8 Open Jt.
  - Skew Bars 7P1 & 4V1 as required
  - Bars 4L @ 8" (Typ.)
  - Bars 4A @ 4" (Typ.)
  - Varies (12" Min., 5'-6" Max.)
  - 2'-6" (Typ.)
  - 5'-0" Interior Post (Typ.)
  - 2'-6" (Typ.)
  - 5'-0" End Post (Typ.)
  - 2" Cover @ Open Joints
  - 1/2 V-Groove Spacing ~ 30'-0" Max. (See Note 7, Sheet 1)
  - Expansion Joint Spacing ~ 30'-0" Min., 90'-0" Max. (See Note 5, Sheet 1)
  - Transfer Devices
- **Plan View**
  - (Skewed Approach Slab shown, Perpendicular Approach Slab similar)
  - (Precast Coping shown, C-I-P Coping similar)
  - (Traffic Railing reinforcement not shown, except for Bars 7P1 & 4V1)
- **Cross References:**
  1. For Detail "A" see Sheet 2.
  2. For "Expansion Joint Detail" see Sheet 1.
  3. For "Junction Slab Notes" see Sheet 1.
PARTIAL ELEVATION VIEW OF OUTSIDE FACE OF COPING

(End Transition and Typical Precast Coping with Curb shown, C-I-P Coping similar)

PARTIAL ELEVATION VIEW OF OUTSIDE FACE OF COPING

(Precast Coping at Expansion Joint and Typical Precast Coping without Curb shown, C-I-P Coping similar)

NOTE: Wall Panels not shown for clarity.

CROSS REFERENCES:
1. For Sections A-A, B-B, C-C & D-D, see Sheet 6.
2. For Junction Slab Notes, see Sheet 1.
**Corral Shape Traffic Railings**

**WALL COPING WITH TRAFFIC RAILING/JUNCTION SLAB**

**Description:**

- **SECTION A-A** (Typical Section Precast Coping Without Curb)
  - See Sheet 2 or 3 for Junction Slab and Precast Coping Details.

- **SECTION A-A** (Typical Section C-I-P Coping Without Curb)
  - See Sheet 2 or 3 for Junction Slab and C-I-P Coping Details.

- **SECTION B-B** (Typical Section With Curb)
  - Precast Coping Shown, C-I-P Coping Similar.
  - Joint sealant required at all expansion joints and between precast and C-I-P curb openings.

- **SECTION C-C** (Typical Section Transition Coping)
  - Precast Coping Shown, C-I-P Coping Similar.

**Notes:**

1. See Sheets 2 & 3 for Junction Slab and additional Coping details.
2. Slip forming of C-I-P Traffic Railing is not permitted.
3. Actual width varies depending on type of Retaining Wall used.
4. See Index No. 424 for Traffic Railing details and Bars 7P1, 4P5, 4R3, 4S3 & 4V1. Bars 5R2 and 5U are not required in Retaining Wall Coping.

**End View D-D**

(Precast Coping Shown, C-I-P Coping Similar)