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 II 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 A36 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 2" Expansion Joints in junction slabs and C-I-P copings plumb and perpendicular or radial to the Gutter Line. Provide at 90'-0" maximum intervals as shown. Provide 3"x3" Mortar plugs in open joints at the base of traffic railings to contain run-off.

6. Shear Keys in junction Slab are required when GFRP bars are used for Dowel Load Transfer Devices and are optional with steel dowel bars. Torque Slope on Shear Key must be constant and between 5" to 45" from horizontal.

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

8. Construct 2" V-Grooves in junction slabs and C-I-P copings at 30'-0" maximum intervals as shown. Space V-Grooves equally between 2" Expansion Joints and/or Begin or End Junction Slab. V-Groove locations are to coincide with V-Groove locations in the Traffic Railing.

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 Sheets 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 3" 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:

   Index No. 420 - Traffic Railing - (32" F-Shape)
   Index No. 425 - Traffic Railing - (42" F-Shape)

13. The following Indexes contain details of the intersection of the retaining wall at approach slabs:

   Index No. 425 - Traffic Railing - (42" F-Shape)
   Index No. 420 - Traffic Railing - (32" F-Shape)

PARTIAL PLAN VIEW FOR F-SHAPE TRAFFIC RAILING
(Precast Coping Shown, C-I-P Coping Similar) (Traffic Railing not Shown for Clarity)

PARTIAL ELEVATION VIEW
(Precast Coping and Junction Slab Reinforcing not Shown for Clarity)
(Precast Coping Shown, C-I-P Coping Similar)
PARTIAL END VIEW OF TRAFFIC RAILING END TRANSITION FOR GUARDRAIL ATTACHMENT (Showing Bars SV and Bars SS) (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) (Typ.)</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. superelevation 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 drawings, 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. The 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.

PRECAST COPING

C-I-P COPING

DETAIL "A"

(Showing locations of ½ V-Grooves and ½ Preformed Expansion Joint Filler)

TYPICAL SECTION THRU PRECAST* 32" F-SHAPED TRAFFIC RAILING AND COPING WITH C-I-P JUNCTION SLAB

* C-I-P Traffic Railing and Coping Sections using precast dimensions and reinforcement are permitted at End Sections, Drainage Inlets and Light Pole Pedestals if slip forming is not used.
**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>
<th>C-I-P</th>
<th>Precast</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>5'-7&quot;</td>
<td>8'-0&quot;</td>
<td>5'-7&quot;</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>5</td>
<td>11'-6&quot;</td>
<td>N/A</td>
<td>9'-6&quot;</td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>5</td>
<td>AS REQD.</td>
<td>AS REQD.</td>
<td>AS REQD.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>5</td>
<td>4'-8&quot;</td>
<td>N/A</td>
<td>4'-8&quot;</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>4'-8&quot;</td>
<td>N/A</td>
<td>4'-8&quot;</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5</td>
<td>4'-8&quot;</td>
<td>4'-8&quot;</td>
<td>4'-8&quot;</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>4</td>
<td>4'-5&quot;</td>
<td>4'-5&quot;</td>
<td>4'-5&quot;</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>4</td>
<td>2'-6&quot;</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>5</td>
<td>5'-7&quot;</td>
<td>5'-7&quot;</td>
<td>5'-7&quot;</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>5</td>
<td>11'-6&quot;</td>
<td>AS REQD.</td>
<td>9'-6&quot;</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>8</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>5</td>
<td>5'-10&quot;</td>
<td>5'-10&quot;</td>
<td>5'-10&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**STIRRUP BAR 5P**

<table>
<thead>
<tr>
<th>S81</th>
<th>1'-0&quot;</th>
<th>1'-0&quot;</th>
</tr>
</thead>
</table>

**STIRRUP BAR 5V2**

<table>
<thead>
<tr>
<th>S82</th>
<th>3'-9&quot;</th>
<th>3'-9&quot;</th>
</tr>
</thead>
</table>

**STIRRUP BAR 5S**

<table>
<thead>
<tr>
<th>S83</th>
<th>4'-8&quot;</th>
<th>4'-8&quot;</th>
</tr>
</thead>
</table>

**PRECAST COPING & 32" F-SHAPE (32" F-Shape)**

1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at expansion and open joints will have a 2" minimum cover.
3. Lap splices for Bars 5B & 5S will be a minimum of 2'-0".
4. For Precast Copings only, lap splice Bars 4A or Bars 5C at alternate Bars 4A for C-I-P Copings.
5. The Contractor may use either full length Bars 4A or lap splice with Bars 5C at alternate Bars 4A for C-I-P Copings.
6. Dimension shown is for lap splice option. For mechanical coupler option, this dimension is 1'-0" (32" F-Shape) or 1'-7" (42" F-Shape).
7. Dimension shown is for lap splice option. For mechanical coupler option, this dimension is 4'-8".
8. 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 931.
9. Contractor may use a single #5 stirrup in lieu of two bars for 5P and 5V2.

**REINFORCING STEEL NOTES:**

1. Match Cross Slope of Travel Lane or Shoulder.
2. Vary the Joint 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. Minimum length of Joint Slab between expansion joints is 30'-0" for 32" F-Shape or 60'-0" for 42" F-Shape.
7. See Index No. 420 & 425 for additional Traffic Railing Details.
8. Contractor to maintain stability of precast coping prior to joint slab completion. In the Shop Drawings, show reinforcement for optional extension required for stability, shipping, and handling. Maintain 2" minimum concrete cover.
9. When the air gap between the precast coping extension and retaining wall exceeds 25" full gap with full depth Expanded Polystyrene to provide a maximum 20° air gap.
10. Angle varies ~ 0° min., 20° max.
11. If slip forming is used, submit shop drawings for approval showing 3" side cover with the typical section dimensions adjusted.

**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>Rebar (Typical excluding Precast)</td>
<td>lb/lf</td>
<td>30.89</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. superimposed load of 6.25 kN, beneath a 32" F-Shape Traffic Railing on an MSE Wall).
### Description of Revised Design Standards FY 2016-17

**Coping Line**
- Bars 4A (Typ.)
- Face of Curb
- Gutters Line
- Bars 4R3 (Typ.)
- 2'-6" (Typ.)
- Bars 7P1 & 4V1 (Typ.)
- 5'-0" Interior Post (Typ.)
- 2'-6" (Typ.)
- Bars 4P5 (Typ.)
- Bars 5B2

**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.

**Reinforcement**
- Field cut reinforcement as required to maintain minimum concrete cover (Typ.)

**Approach Slab**
- 5'-0" End Post
- Skew Bars 7P1 & 4V1 as required
- Varies 2'-6" (Typ.)
- Bars 4L @ 8" (Typ.)
- Bars 4A @ 4" (Typ.)
- Bars 5C @ 8" sp. (Tie to Bars 4A) (Typ.)

**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)

**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)
PARTIAL ELEVATION VIEW OF OUTSIDE FACE OF COPING
(End Transition and Typical Precast Coping with Curb shown, C-I-P Coping similar)

Top of Precast Coping
Post (Precast or C-I-P) (Typ.)

Bars 4A (Typ.)
Bars 4L (Typ.)
Bars 7P1 & 4V1 spaced @ 8"s (Tie to alternate Bars 4A)

Top of C-I-P
Traffic Railing

Bars 4L (Typ.)
Bars 4A (Typ.)
Bars 7P1 & 4V1 spaced @ 8"s (Tie to alternate Bars 4A)

Top of C-I-P
Traffic Railing

Bars 4L (Typ.)
Bars 4A (Typ.)
Bars 7P1 & 4V1 spaced @ 8"s (Tie to alternate Bars 4A)

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.
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.

NOTE:
Joint sealant required at all expansion joints and between precast and C-I-P curbs openings.

CURB JOINT SEALANT DETAIL

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.

NOTE:
Joint sealant required at all expansion joints and between precast and C-I-P curb openings.

CURB JOINT SEALANT DETAIL

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.

NOTE:
Joint sealant required at all expansion joints and between precast and C-I-P curb openings.

CURB JOINT SEALANT DETAIL

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.

NOTE:
Joint sealant required at all expansion joints and between precast and C-I-P curb openings.

CURB JOINT SEALANT DETAIL

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.

NOTE:
Joint sealant required at all expansion joints and between precast and C-I-P curb openings.

CURB JOINT SEALANT DETAIL

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.

NOTE:
Joint sealant required at all expansion joints and between precast and C-I-P curb openings.