REINFORCING STEEL BENDING DIAGRAMS - JUNCTION SLAB

BILL OF REINFORCING STEEL

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>132&quot; F-SHAPE</th>
<th>42&quot; F-SHAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>9'-6&quot;</td>
<td>9'-6&quot;</td>
</tr>
<tr>
<td>B1</td>
<td>5</td>
<td>9'-6&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>B2</td>
<td>5</td>
<td>AS REQD.</td>
<td>AS REQD.</td>
</tr>
<tr>
<td>C</td>
<td>5</td>
<td>7'-8&quot;</td>
<td>7'-8&quot;</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
</tr>
<tr>
<td>F</td>
<td>5</td>
<td>8'-3&quot;</td>
<td>8'-3&quot;</td>
</tr>
<tr>
<td>L</td>
<td>6</td>
<td>5'-4&quot;</td>
<td>5'-7&quot;</td>
</tr>
<tr>
<td>U1</td>
<td>6</td>
<td>3'-8&quot;</td>
<td>3'-8&quot;</td>
</tr>
</tbody>
</table>

1" DOWEL

PRECAST BAR 4D

Dowel Bar 4D

BAR 6L

BAR 6U1

PRECAST OR C.I.P. COPING WITH C.I.P. JUNCTION SLAB AND RETAINING WALL AT EXPANSION JOINTS

TYPICAL SECTION THRU C.I.P. COPING AND JUNCTION SLAB AND RETAINING WALL AT EXPANSION JOINTS

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</td>
<td>CY/FL.</td>
<td>0.458</td>
</tr>
<tr>
<td>Reinforcing Steel (Typical) excluding Bars 5V and 5S (Typ.)</td>
<td>Lb./FL.</td>
<td>64.20</td>
</tr>
<tr>
<td>Additional Rein. @ Expansion Joint</td>
<td>Lb./FL.</td>
<td>42.72</td>
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</table>

Permanent Retaining Wall Systems

R092212 Changed "Continuous Joint Filler" to "Preformed Joint Filler" in TYPICAL SECTION detail.
### Bill of Reinforcing Steel

**Mark** | **Size** | **Lenth** | **Pre-Cast Coping** | **C.P. Coping**
--- | --- | --- | --- | ---
A | 5 | 5'-7" | 6'-0" | N/A
B1 | 5 | 5'-0" | 6'-0" | N/A
B2 | 5 | AS REQD. | AS REQD. | N/A
C | 5 | 5'-5" | 6'-0" | N/A
D | 4 | 2'-0" | N/A | N/A
F | 5 | 5'-0" | 5'-0" | N/A
L | 5 | 5'-0" | 8'-1" | N/A
UI | 5 | 3'-8" | 3'-8" | N/A

1 1" Dowel Smooth SteelBar 2'-0" 2'-0"

### Revisions

1. Changed "Continuous Neoprene Strip" to "Preformed Joint Filler" in TYPICAL SECTION detail.

### Reinforcing Steel Notes:

1. Actual bar dimensions in the bending diagrams are cut to out.
2. All reinforcing steel expansion joints will have a 2" minimum cover.
3. Lap splices for Bars 5B with a minimum of 2'-2".
4. Lap splice Bars 5L with Bars 5C. Lap splices will be a minimum of 2'-2".
5. See Index No. 422 and Index No. 423 for Bars 5S, 5T, and 5X. Adjust vertical dimension as required for other curb types or transitions at Begin or End Retaining Wall.
6. Dimension shown is for lap splice option. For mechanical coupler option, this dimension is 1'-2".
7. Dimension shown is for lap splice option. For mechanical coupler option, this dimension is 1'-2".
8. The Contractor may use Welded Wire Reinforcement when approved by the Engineer. Welded Wire Reinforcement will conform to ASTM A 497.

### Estimated Quantities for C.I.P. Coping

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Concrete</td>
<td>CY/Ft.</td>
<td>0.538</td>
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<tr>
<td>Reinforcing Steel (Typical) excluding Bars 5L, 5X, and 5S (Typ.)</td>
<td>Lb./Ft.</td>
<td>51.63</td>
</tr>
<tr>
<td>Additional Rein. @ Expansion Joints</td>
<td>Lb.</td>
<td>32.04</td>
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The above concrete quantities are based on a 5" wide retaining wall panel and a Type D Concrete Curb (See Note 3).

### TYPICAL SECTION THRU C.I.P. COPING AND RAISED SIDEWALK AND RETAINING WALL AT EXPANSION JOINTS

**RAISED SIDEWALK NOTES:**

1. Actual width varies depending on type of Retaining Wall used.
2. Match roadway curb shape (Type) and height. See Roadway Plans and Index No. 300. 6'-8" dimension is based on 32" Vertical Shape Traffic Railing with a Type D curb adjacent to a 6'-0" wide sidewalk. Adjust this dimension as required for other curb types or transitions at Begin or End Retaining Wall.
3. See Index No. 422 and Index No. 423 for Bars 5S, 5T, and 5X and Bullet Railing details. Adjust vertical dimension of Bars 5T and 5X, see Reinforcing Steel Note 5.
4. Increase the width (1'-2") of Bars 5U1 as required to maintain 2" minimum cover when recess width exceeds 8".

### Precast or C.I.P. Coping with C.I.P. Raised Sidewalk Details (Vertical Shape Traffic Railing)

**PERMANENT RETAINING WALL SYSTEMS**

**2010 Interim Design Standard**

**Sheet No.**

**Note:**

1. **C.I.P. Traffic Railing:** (32" Vertical Shape shown) (42" Vertical Shape similar) Top of C.I.P. Coping (Const. Joint Required)
2. **Bars 5L:** @ 6" sp.
3. **Bars 5T:** @ 1'-0" sp.
4. **Bars 5X:** @ 1'-0" sp.
5. **Bars 5S:** @ 1'-0" sp.
6. **Bars 5A, 5B1, 5B2, 5C, and 5F:** (See Note 3)
7. **Bars 5U1:** (Typ.)

**(Note 1) See Wall Company Drawings for Details)**

**Permanent Retaining Wall:**

- **Gutter Line:**
- **C.I.P. Traffic Railing**
- **Bars 5L:** @ 6" sp.
- **Bars 5T:** @ 1'-0" sp.
- **Bars 5X:** @ 1'-0" sp.
- **Bars 5S:** @ 1'-0" sp.
- **Bars 5U1:** (Typ.)

**Note 2:** See Note 1

**Note 3:** See Note 1

**Note 4:** See Note 1
LIGHT PILASTER NOTES:

1. The pilaster and junction slab are designed to resist the following working loads from the light pole applied at the top of the Pilaster:
   - Axial Deadload: 1,560 kip
   - Windload Moment about Transverse Axis (*): 40.60 kip-ft
   - Windload Moment about Longitudinal Axis (*): 28.30 kip-ft
   - Deadload Moment about Longitudinal Axis (*): 1,660 kip-ft
   - Maximum Shear: 1,380 kip
   - Torsion about Pole Axis (*): 3.560 kip-ft
   - (*) - Axis refers to Bridge Axis.

2. See Index No. 21200 for anchor bolt design and notes.

3. The Contractor is responsible for ensuring the anchor bolt design is compatible with the light pole base plate. Modifications to the anchor bolt design must be signed and sealed by the Contractor's Specialty Engineer and submitted to the Engineer for approval prior to construction.

4. Install Anchor Bolts plumb.

5. For conduit, pull box and expansion/deflection fitting details, see Utility Conduit Detail Drawings.

6. The cost of wire screen, anchor bolts, nuts, washers and anchor plates will be included in the Bid Price for Light Poles. Include the cost of steel reinforcement required for the completion of the electrical system in the Bid Price for either the Traffic Railing or Concrete Parapet that the pilaster is behind.

7. Field Cut Bars 4M2 as required to maintain clearance.

8. Anchor Bolt pattern orientation will be as shown.

9. Slip Forming Method of construction requires the Engineer's approval within the limits shown.

10. Reinforcing shown for light pole pilasters is in addition to typical reinforcing for C.I.P. Junction Slabs and Raised Sidewalks (Bars 5A and 5B2). Omit Junction Slab Bars 6U1 and Raised Sidewalk Bars 5U1 within light pole pilaster limits.

11. Work this Sheet with the following as appropriate:
   - Sheet Nos. 5 thru 10 of 19 - Precast or C.I.P. Coping with C.I.P. Junction Slab Details
   - Sheet Nos. 11, 12 and 13 of 19 - Precast or C.I.P. Coping with C.I.P. Raised Sidewalk Details
   - Sheet Nos. 14 and 15 of 19 - Precast Coping/Parapets or C.I.P. Coping with C.I.P. Sidewalk Details

CROSS REFERENCE: For Estimated Quantities, see Sheet No. 18 of 19.

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PLAN VIEW
(Junction Slab reinforcing not shown for clarity)
(Junction Slab Shown, Raised Sidewalk or Sidewalk Similar)
TYPICAL SECTION AT LIGHT POLE PILASTER
(Traffic Railing Shown, Concrete Parapet Similar)
(Junction Slab Shown, Raised Sidewalk or Sidewalk Similar)

NOTES:
1. The 8'-0" dimension shown is for Junction Slabs. This dimension must be a minimum of 5'-0" for all applications.
2. For junction slabs, increase the 1'-0" depth dimension to 1'-6". For raised sidewalks, increase the 2'-0" depth dimension to 2'-6". For sidewalks, increase the 6" depth dimension to 1'-6". The minimum length of the Junction Slabs, Raised sidewalks and Sidewalks is 50'-0", measured along the Gutter Line.
3. Bars 4J are only required when pilasters are behind a Traffic Railing.
4. Match the slope of the adjoining junction slab and shoulder or roadway pavement, raised sidewalk or sidewalk.
5. Actual width varies depending on type of Retaining Wall used.
6. See Index No. 420 for Bars 5V and 5S.
**C.I.P. Pilaster and Light Pole**

Bottom of Junction Slab

3 s p. @ 3" È

Varies (Transition to 1'-6" Thick Junction Slab)

Bars 4G1 (pairs)

Bars 4G4 (pairs) (Typ.)

NOTES:

1. Field Cut Bars 4M2 as required to maintain minimum cover.

2. Maximum clearance between leveling nut and top of pilaster will not exceed anchor bolt diameter.

4" Cover (Bottom)

2" Cover (Top & sides)

Bars 4M2 (See Note 1)

Bars 4H2

5'-0" Max. (Left or Right)

See Detail "A"

7'-6" (Length of 1'-6" Thick Junction Slab)

45° (Typ.)

Bars 4G3 (pairs) (Typ.)

Bars 4G5 (pairs) (Typ.)

Bars 4G2 (pairs) (Typ.)

Bars 4H1

2'-0"

C.I.P. Pilaster

6"

2½" Spacing Bars 4H

Varies

2" Conduit

1½" Conduit

ELEVATION VIEW

(Junction Slab Reinforcing & Bars 4J not Shown for Clarity)

(Traffic Railing Shown, Concrete Parapet Similar)

(Junction Slab Shown, Raised Sidewalk or Sidewalk Similar)

NOTES:

1. Field Cut Bars 4M2 as required to maintain minimum cover.

2. Maximum clearance between leveling nut and top of pilaster without exceed anchor bolt diameter.

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**ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (Pilaster)</td>
<td>CY</td>
<td>0.926</td>
</tr>
<tr>
<td>Concrete (Thickened Junction Slab)</td>
<td>CY</td>
<td>1.185</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>Lb.</td>
<td>428</td>
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(The quantities above are for one C.I.P. Light Pole Pilaster. The concrete quantity for the thickened junction slab is based on a 6" increase in thickness and a 5" wide retaining wall panel. Adjust thickened concrete quantity as required for raised sidewalks and sidewalks.)

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**REINFORCING STEEL BENDING DIAGRAMS – LIGHT PILASTER**

**BILL OF REINFORCING STEEL**

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>NO. REQD.</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3</td>
<td>4</td>
<td>16</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>G2</td>
<td>4</td>
<td>4</td>
<td>4'-8&quot;</td>
</tr>
<tr>
<td>G3</td>
<td>4</td>
<td>4</td>
<td>4'-8&quot;</td>
</tr>
<tr>
<td>G4</td>
<td>4</td>
<td>6</td>
<td>8'-10&quot;</td>
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<td>G5</td>
<td>4</td>
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<td>7'-4&quot;</td>
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<td>H1</td>
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<td>3'-8&quot;</td>
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<tr>
<td>H2</td>
<td>4</td>
<td>2</td>
<td>13'-8&quot;</td>
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<td>4</td>
<td>24</td>
<td>6'-0&quot;</td>
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<td>4</td>
<td>12</td>
<td>8'-10&quot;</td>
</tr>
<tr>
<td>M2</td>
<td>4</td>
<td>10</td>
<td>3'-8&quot;</td>
</tr>
</tbody>
</table>

**REINFORCING STEEL NOTES:**

1. All dimensions in the bending diagrams are out to out.

2. Lap splices for Bars 4G1, 4G2 & 4G3 will be a minimum of 1'-4". Lap splices for Bars 4G4 & 4G5 will be a minimum of 1'-8".

3. The Contractor may use Welded Wire Reinforcement when approved by the Engineer. Welded Wire Reinforcement will conform to ASTM A 497.