**NOTES**

**DESIGN SPECIFICATIONS:**

**TRAFFIC RAILINGS OR PARAPETS:**
If there is a Traffic Railing or Parapet on the wall, align Wall Joints with V-Grooves, and Wall Expansion Joints with Barrier Open Joints.

**FOUNDATION:** Prepare the soil below the footing in accordance with the requirements for spread footings in Specification Section 495.

**REINFORCING STEEL BENDING DIAGRAMS**

- **Bars GI**
- **Bars J & K**

*Shear Key is required only when specified in the Plans.*

**TYPICAL SECTION**

- **Footing Cover (Typ.)**
- **Bars F (paired with Bars J)**
- **Bars G1 (evenly spaced)**
- **Bars G2 (evenly spaced)**
- **Bars A (paired with Bars J)**
- **Bars H**
- **Bars K (F.S.)**
- **Bars L (F.S.)**
- **Bars M (N.S.)**
- **Bars F (N.S.)**
- **Bars Z (N.S.)**
- **Bars Z (evenly spaced)**
- **Bars A (F.S.)**
- **Bars J & K**
- **Const. Jt.**
- **Bars G1**
- **Bars H**
- **Footage Cover (bottom only)**
- **Bars N (paired with Bars F)**
- **Footage Cover (Typ.)**
- **Bars G2**
- **Bars A (F.S.)**
- **Bars K (F.S.)**
- **Bars J (F.S.)**
- **Bars Z (N.S.)**

**VIEW A-A**
(Shear key shown dashed)

**NOTE:** See Plans for Retaining Wall Data
**Wall joint spacing 25 ft. maximum and 5' minimum. At minimum, every fourth wall joint to be an expansion joint. See Plans for actual wall joint spacing and expansion joint location.**

**Wall Joint Spacing**

\[ \text{Stem Offset} = \frac{H}{16} \text{ (in.)} \]

\[ \text{Stem Offset} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

Ground Line

Top of Footing

Level (Typ.)

3" Ø PVC Drain Pipe at 10 ft. max. spacing (Typ.)

See ‘Detail A’

See 'Detail R'

At Contractor's option, Surface Treatments may terminate 8' below grade line

\( \text{Stem Offset} = \frac{H(\text{Ft.})}{16} \)

(Stem Offset \( \leq \) Joint Depth)

**V-Groove Detail**

V-Groove (Typ.)

Front Face of Wall

Stem Offset (Typ.)

45°

Options Shear Key

3" Ø PVC Drain Pipe at 10 ft. max. spacing (Typ.)

See ‘Detail A’

See ‘Detail R’

At Contractor's option, Surface Treatments may terminate 8' below grade line

**.stem Offset Values**

( for \( H \leq 20 \text{ Ft.} \))

Top of CIP Wall

SECTION A-A

WALL JOINT DETAIL

\[ \text{Stem Offset} = \frac{H}{16} \text{ (in.)} \]

(Typ.)

Slope backfill layers transversely and longitudinally as necessary to drain and prevent ponding during backfilling.

Limit of Excavation

\[ \text{Slope backfill layers transversely and longitudinally as necessary to drain and prevent ponding during backfilling.} \]

At Contractor's option, Surface Treatments may terminate 8' below grade line

\[ \text{Drain shall be continuous 1.5' x 1.5' clean, broken stone or gravel, graded and placed to allow free drainage. Place Type D-3 (see Specification Section 985) geotextile fabric, 1'-0" wide and full height of fill, to the back of wall with an adhesive approved by the Engineer.} \]

* Key to stop at top of footing and 6" from top of wall. Joint across footing and top of wall to be a straight line.

** Stay-In-Place Plastic Preformed Bond Beakers are permitted to form joints.**

**Typical Backfill Detail**

Inside ends of weep holes shall be covered with 1.0 square foot of galvanized mesh with 1/8" openings

**Typical Corner Joint Detail**

Traffic Railing (Index No. 420, 32" F-Shape shown, see Plans for Traffic Railing type)

(Junction Slab See Index Series 6100)

See ‘Detail A’

See 'Detail R’

At Contractor's option, Surface Treatments may terminate 8' below grade line

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)

**Wall Joint**

\[ \text{Wall Joint} = \frac{H}{16} \text{ (in.)} \]

(Stem Offset \( \leq \) Joint Depth)

\[ \text{Wall Joint} = \frac{H(\text{Ft.})}{16} \]

(Stem Offset \( \leq \) Joint Depth)
GENERAL NOTES

1. C-I-P Gravity Walls constructed as extensions of reinforced concrete retaining walls, except walls of proprietary designs, shall have the same face texture and finish as the reinforced concrete retaining wall.

2. Concrete for Gravity Wall shall be Class NS per Section 347. Concrete for Scheme 3 Junction Slab and Traffic Railing shall be Class II per Section 346, unless otherwise specified in the plans.

3. Reinforcing steel shall meet the requirements of Specification Section 931 (Grade 40 or 60). Smooth or Deformed Welded Wire Reinforcement (WWR) may be substituted on an equal area basis. Do not increase bar/wire spacing for Grade 60 reinforcing steel or WWR.

4. When required, for adjacent grade barriers, see Index B70 or B80 as appropriate. For adjacent Type B fence see Index 802.

5. Joint Seal: Organic Felt bond breaker in accordance with Specification Section 455 (Spread Footings).

6. Provide a continuous 1-½" thick gravel or crushed rock drain for wall heights 3 ft. and higher. Wrap drainage layer as shown, with Type D-3 geotextile fabric in accordance with Specification Section 985. Mop all contact surfaces of concrete and Organic Felt or geotextile fabric with cut-back asphalt. Stop Organic Felt or geotextile fabric 6" below top of wall.

7. Cost of reinforcing steel, face texture, finish, joint seal, drain pipes, drainage layer, galvanized mesh and geotextile fabric to be included in the Contract Unit Price for Concrete and Geotextile Barrier With Junction Slab. Adjunct railings or fences to be paid for separately.

BILL OF REINFORCING STEEL

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</tr>
<tr>
<td>0</td>
<td>0</td>
<td>As Req'd</td>
</tr>
</tbody>
</table>

BAR BENDING DIAGRAM

SCHEME 1
(No Traffic Loading Effects & Upper Slopes ≤ 1:1½)

SCHEME 2
(With Traffic Loading or Upper Slopes > 1:1½)

SCHEME 3
(With Traffic Railing)

ESTIMATED QUANTITIES FOR C-I-P WALL

<table>
<thead>
<tr>
<th>PEEL HOLES &amp; DRAIN HOLE</th>
<th>BARS B (Typ.)</th>
<th>BARS A (Typ.)</th>
<th>BARS A @ 1'-6&quot; Ctrs. (Max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1' - 0&quot;</td>
<td>0.65</td>
<td>0.47</td>
<td>0.32 (0.55%)</td>
</tr>
<tr>
<td>2' - 0&quot;</td>
<td>0.60</td>
<td>0.43</td>
<td>0.32 (0.55%)</td>
</tr>
<tr>
<td>3' - 0&quot;</td>
<td>0.65</td>
<td>0.47</td>
<td>0.32 (0.55%)</td>
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</table>

KEYWAY & WALL JOINT DETAIL
(TOP VIEW)

TYPICAL SECTION
C-I-P CONCRETE GRAVITY WALL

GRAVITY WALL

DESIGN STANDARDS
FY 2017-18
INDEX NO. 6011
SHEET 1 of 1

NOTES:
1. All bar dimensions are cut to out.
2. Lap splices for Bars A must be a minimum of 1½D.
**NOTES**

**DESIGN CRITERIA:**
1. Design is based on the assumption that the material contained within the reinforced soil volume, methods of construction and quality of prefabricated materials are in accordance with Specification Section 548 and Chapter 3 of the FDOT Structures Design Guidelines.

**SOIL PARAMETERS:**
1. See Wall Control Drawings for soil characteristics of foundation material to be used in the design of the wall system.
2. The Contractor will provide soil design parameters for backfill material based on the actual soil characteristics utilized at the site.

**MATERIALS:**
1. See Specification Section 548 for material requirements.

**CONSTRUCTION:**
1. Walls will be constructed in accordance with Specification Section 548 and the Wall Company’s instructions.
2. For location and alignment of retaining walls, see Wall Control Drawings.
3. If required, locate manholes and drop inlets as shown on wall elevations.
4. Refer to Wall Control Drawings of individual walls for minimum reinforcement strip/mesh length, factored bearing resistance, minimum wall embedment and anticipated long term and differential settlement.
5. The Contractor is responsible for controlling water during storm events as needed during construction.
6. It is the Contractor’s responsibility to determine the location of any guardrail posts behind retaining wall panels. Prior to placement of the top layer of soil reinforcement, individual reinforcing strips/mesh may be skewed (15° maximum) to avoid the post locations if authorized by the Engineer. No cutting of soil reinforcement is allowed unless shown on Shop Drawings and approved by the Engineer. Any damage done to the soil reinforcement due to installation of the guardrail shall be repaired by the Contractor at the Contractor’s expense. Repair method will be approved by the Engineer.
7. If existing or future structures, pipes, foundations or guardrail posts within the reinforced soil volume interfere with the normal placement of soil reinforcement and specific directions have not been provided on the plans, the Contractor will notify the Engineer to determine what course of action shall be taken.
8. The Contractor is responsible for gradually displacing upper layer(s) of the soil reinforcement downward (15° maximum from horizontal) to avoid cutting soil reinforcement and conflicts with paving and subgrade preparation. The Contractor’s attention is directed especially to situations where roadway superelevation and/or soil mixing are anticipated.
9. For concrete facing panel surface treatment, see Wall Control Drawings. Extend surface treatment a minimum of 6” below final ground line.
10. Drive piles located within the soil volume prior to construction of the retaining wall, unless a method to protect the structure, acceptable to both the Engineer and Wall Company, is proposed and approved in writing. The portion of piles or drilled shafts extensions within the soil volume will be wrapped with polyethylene sheeting in accordance with Specification Section 696.
11. A structural extension of the connection of the retaining wall to soil reinforcement will be used whenever necessary to avoid cutting or excessive skewing (greater than 15°) of the soil reinforcement around obstructions (i.e., piles, pipes, manholes, drop inlets, etc.).
12. Steps in leveling pads will occur at MSE Wall panel interfaces. Panels will not cantilever more than 2” past the end of the upper tier leveling pad.
13. The top of the leveling pad or footing will be 2'-0" minimum below final ground line.
14. Top of leveling pad elevations shown in the Wall Control Drawings are maximum elevations. The constructed leveling pad elevations may be deeper based on the panel layout shown in the shop drawings.
15. The height of panels in the bottom course of MSE Walls must not be less than half the height of a standard panel.
16. Work this Index with Index 6100 & 6200 Series.

**SHOP DRAWING REQUIREMENTS:**
See Specification Section 548 for shop drawing requirements.

---

**GENERAL NOTES AND DETAILS**

**FOOT MSE RETAINING WALL CLASSIFICATION TABLE**

<table>
<thead>
<tr>
<th>Applicable Foot Wall Type *</th>
<th>Concrete Cover (in.)</th>
<th>Concrete Class</th>
<th>Pozzolan Additions? **</th>
<th>Soil Reinforcement Type</th>
<th>2A</th>
<th>2B</th>
<th>2C</th>
<th>2D</th>
<th>2E</th>
<th>2F</th>
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<tr>
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<td>2</td>
<td>II</td>
<td>No</td>
<td>Negal</td>
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<td>✓</td>
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<td>Type 2B</td>
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<td>IV</td>
<td>No</td>
<td>Negal</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Type 2C</td>
<td>3</td>
<td>IV</td>
<td>No</td>
<td>Negal</td>
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<td>✓</td>
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<td>✓</td>
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<td>✓</td>
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<tr>
<td>Type 2D</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* See Data Table in Contract Plans.
** Silica fume, metakaolin or ultrafine fly ash.

---

**GENERAL NOTES AND DETAILS**

**PERMANENT MSE RETAINING WALL SYSTEMS**

**INDEX**

**SHEET**

**FY 2017-18**

**DESIGN STANDARDS**

**LAST REVISION 07/01/15**

**DESCRIPTION:**

**PERMANENT MSE RETAINING WALL SYSTEMS**

**INDEX NO.** 6020

**SHEET NO.** 1 of 1
NOTES

DESIGN CRITERIA:
1. Design is based on the assumption that the material contained within the reinforced soil volume, methods of construction and quality of prefabricated materials are in accordance with Specification Section 548 and FDOT Structures Design Guidelines Section 3.13.2.
2. It is the responsibility of the Engineer to determine that the factored bearing pressure shown for the wall does not exceed the factored bearing resistance of the foundation for that specific wall location.
3. The Wall Company is responsible for internal stability of the wall. External stability design, including foundation and slope stability, is the responsibility of the Engineer.
4. If present, consider in design and analysis and locate manholes and drop inlets as shown on wall elevations.

SOIL PARAMETERS:
1. See wall control drawings for soil characteristics of foundation material to be used in the design of the wall system. The Contractor must provide soil design parameters for backfill material based on the actual soil characteristics utilized at the site. Provide the values of unit weight, cohesion and internal friction angle in the Shop Drawings.

MATERIALS:
1. Provide soil reinforcement in accordance with Specification Section 548.
2. For additional material notes, see Wall Company General Notes.

CONSTRUCTION:
1. Walls must be constructed in accordance with Specification Section 548 and the Wall Company's instructions.
2. For location and alignment of retaining walls, see Wall Control Drawings.
3. Refer to Plan and Elevation sheets of individual walls for minimum reinforcement strip/mesh length. Factored bearing resistance, minimum wall embedment and anticipated long term and differential settlements.
4. If existing or future structures, pipes, foundations or guardrail posts within the reinforced soil volume interfere with the normal placement of soil reinforcement and specific directions have not been provided on the plans, the Contractor must notify the Engineer to determine what course of action should be taken.
5. The Contractor is responsible for gradually deflecting upper layer(s) of soil reinforcement downward (15° maximum from horizontal) to avoid ending soil reinforcement and conflicts with paving and subgrade preparation. The Contractor's attention is directed especially to situations where roadway superelevation and/or soil mixing are anticipated.

GENERAL NOTES AND DETAILS

TEMPORARY MSE RETAINING WALL SYSTEMS

TEMPORARY TRAFFIC RAILING

PLACEMENT DETAIL

TYPICAL RETAINING WALL SECTION
(Showing Limits of the Reinforced Soil Volume)
This Design Standard includes details for five types of piles with two thicknesses. Types "B1", "B2", "C1" and "C2" piles (corner piles) are of reinforced concrete construction, and Type "A" is of prestressed concrete construction. The piles shall be manufactured, cured and installed in accordance with the requirements of the contract documents.

**MATERIALS:**
- **Concrete**
  - Class: V (Special) for slightly and moderately aggressive environments
  - V (Special w/ Silica Fume) for extremely aggressive environment
  - Unit weight: 150 psf
  - Modulus of Elasticity: Based on the use of Florida limerock concrete

**REINFORCING STEEL**
- ASTM A615 Grade 60

**PRESTRESSING STEEL**
- ASTM A416 Grade 270 (Low-Relaxation Strand)

**DESIGN PARAMETERS:**
- **Type "A"**
  - Concrete Compressive Strength at release of prestressing: 4000 psi minimum
  - Uniform compression after prestressing losses: 1000 psi minimum
  - Pick-up, Storage and Transportation: 0.0 psi tension with 1.5 times pile self weight

- **Types "B1", "B2", "C1" & "C2"**
  - Pick-up, Storage and Transportation: Minimum compressive strength f'ci ≥ 4000 psi required.

**ENVIRONMENT:**
The pile designs are applicable to all Environments.

**PLASTIC FILTER FABRIC:**
The plastic filter fabric shall extend to the bottom of the "X" dimension.

**PILE PICK-UP AND HANDLING:**
- **Type "A"**
  - Pick-up of pile may be either a single point pick-up or a two point pick-up as shown below.

- **Types "B1", "B2", "C1" & "C2"**
  - Two point pick-up for lifting out of forms & two point support for storage & transportation.
  - Single point pick-up for installation only.

**PILE FIT-UP:**
The 2'-6" Sheet Pile dimension is nominal. This dimension may be shortened by the Manufacturer up to 1/2" to allow for Sheet Pile fit-up in its final position. Minimum Sheet Pile width is 2'-5 1/2". No changes shall be made to the tongues or grooves.

**DETAIL "A"**
(Cap and Anchoring System Not Shown)
(Section Taken Above Dimension X)

**NOTE:** Detail "A" shows a Part-Plan View of an assumed bulkhead. See Bulkhead plans for actual Pile View.
**TYPICAL PILE**

**STARTER PILE**

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>STRAND DIA. (in.)</th>
<th>MAXIMUM L (in.)</th>
<th>n</th>
<th>D (in.)</th>
<th>TOTAL # OF STRANDS</th>
<th>SECTION MODULUS (in.²)</th>
<th>* STRESS (psi)</th>
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<tbody>
<tr>
<td>1'-10 in.</td>
<td>0.5</td>
<td>28'-0&quot;</td>
<td>6</td>
<td>3/8&quot;</td>
<td>14</td>
<td>500</td>
<td>1150</td>
</tr>
<tr>
<td>1'-12 in.</td>
<td>0.6</td>
<td>31'-0&quot;</td>
<td>7</td>
<td>2/8&quot;</td>
<td>16</td>
<td>720</td>
<td>1100</td>
</tr>
</tbody>
</table>

* Unit Prestress after losses.

---

**NOTES:**

1. Intermediate Prestress Strands not shown in Elevations and Sections.
2. All bar dimensions are out-to-out.
3. Bars A are #5 and Bars S are #4.
4. At the Contractor's option Bars S may be fabricated as a two piece bar as shown in the Bar Bending Diagram.
5. The Contractor may use Deformed Welded Wire Reinforcement meeting the requirements of Specification Section 933 in lieu of Bars A and Bars S if the wire size and spacing provide the same area of reinforcing steel per foot as the Bars shown.
6. For Dimensions L and A see Sheet Pile Data Table in Structures Plans.

---

**PRECAST CONCRETE SHEET PILE WALL**
STIRRUP DIMENSIONS (T = 10")

<table>
<thead>
<tr>
<th>Ø</th>
<th>BAR MARK</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
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<tr>
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<td>S1</td>
<td>11½</td>
<td>8&quot;</td>
<td>1'-4&quot;</td>
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<td>7&quot;</td>
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<td></td>
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<td>3&quot;</td>
<td>5½</td>
<td>7&quot;</td>
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<tr>
<td></td>
<td>S3</td>
<td>12½</td>
<td>8&quot;</td>
<td>1'-6&quot;</td>
<td>5½</td>
<td>6&quot;</td>
<td>7&quot;</td>
<td>3&quot;</td>
<td>5½</td>
</tr>
<tr>
<td></td>
<td>S4</td>
<td>12½</td>
<td>5½</td>
<td>6&quot;</td>
<td>8&quot;</td>
<td>1'-6&quot;</td>
<td>3&quot;</td>
<td>5½</td>
<td>7&quot;</td>
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</table>

STIRRUP DIMENSIONS (T = 12")

<table>
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<tr>
<th>Ø</th>
<th>BAR MARK</th>
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<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
<th>R8</th>
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</thead>
<tbody>
<tr>
<td>30'</td>
<td>S1</td>
<td>11½</td>
<td>8&quot;</td>
<td>1'-4&quot;</td>
<td>5½</td>
<td>6&quot;</td>
<td>7&quot;</td>
<td>3&quot;</td>
<td>5½</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>S4</td>
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<td>8&quot;</td>
<td>1'-6&quot;</td>
<td>3&quot;</td>
<td>5½</td>
<td>7&quot;</td>
</tr>
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BAR BENDING DIAGRAMS

NOTES:
1. This drawing includes details for precast concrete corner plies for 10" and 12" thick sheet pile systems. The details apply equally to both thicknesses.
2. The bar configurations shown in Sections A-A and B-B shall be used for Ø angles between 15° and 75°. For Ø angles not shown, the reinforcing bar dimensions may be interpolated or extrapolated from the stirrup dimensions shown.
3. All bar dimensions are out-to-out.
4. Bars A are #8 and Bars S are #4.
5. Values for Stirrup Dimensions are shown for Ø equal to 30°, 45° & 60° only.
6. At the Contractor's option Bars S may be fabricated as a 2 piece bar with a minimum lap length of 1'-4", as shown in Bar Bending Diagrams.
7. If Type "B1" or "B2" pile is used as a Starter Pile show tongue on both sides of pile from Dim. X down. Show dimensions for Bars S2, S3 & S4 in shop drawings.
8. If tongue must be on the opposite side from that shown all dimensions and Bars A, S2, S3 and S4 will be the same but opposite hand.
9. For Dimensions L, X and Angle Ø, see Sheet Pile Data Table in Structures Plans.

DETAIL "D" (TYPE "B1" PILE SHOWN, TYPE "B2" PILE OPPOSITE HAND)

SITE PILE DIMENSIONS

<table>
<thead>
<tr>
<th>T (in)</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø (in)</td>
<td>3½</td>
<td>4½</td>
</tr>
</tbody>
</table>

Type "B1" and "B2" - Variable Angle Corner Pile Wall

INDEX NO. 6040

FDOOT 2017-18 DESIGN STANDARDS

PRECAST CONCRETE SHEET PILE WALL
1. All bar dimensions are out-to-out.
2. Bars A are #8 and Bars S are #4.
3. This drawing includes information for precast Corner Piles for 10" and 12" thick Sheet Pile systems. The details apply to both thicknesses but the bar configurations change slightly according to the thickness values used.
4. If Type "C1" or "C2" pile is used as a Starter Pile show tongue on both sides of pile from Dim. X down. Show dimensions for Bars S2, S3, S4 & S5 in shop drawings.
5. If tongue must be on opposite side (Groove Side) from that shown, all dimensions and reinforcement shall follow the corresponding Tongue or Groove side.
6. For Dimensions L and X see Sheet Pile Data Table in Structures Plans.

** Notes:
- This Bar A4 shall be 1'-2" shorter than other A4 bars for T = 12".
- ** This Bar A4 (not shown in elevation) is included only if T = 12".

** BAR BENDING DIAGRAMS**

** STIRRUPS S**

** SHEET PILE DIMENSIONS**

** PRECAST CONCRETE SHEET PILE WALL**

** TYPE "C1" AND "C2" - RIGHT ANGLE CORNER PILE**
PRECAST COPING - PARTIAL ELEVATION VIEW

SECTION A-A

C-I-P COPING

SECTION B-B
PRECAST COPING

PRECAST AND C-I-P COPING NOTES:
1. Provide Class II concrete for slightly aggressive environments or Class IV for moderately or extremely aggressive environments.
2. Dowel Bars 4D extend 11" above the top of retaining wall panel. Field cut as necessary to maintain 2" minimum cover. See Wall Company Drawings for number and spacing of Dowel Bars 4D.
3. Payment for Dowel Bars 4D, Buildup Concrete and Coping will be made under Retaining Wall System (Permanent).
Bill of Reinforcing Steel

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>LENGTH (L)</th>
<th>LENGTH (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>AS REQ'D.</td>
<td>AS REQ'D.</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>AS REQ'D.</td>
<td>AS REQ'D.</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
</tr>
<tr>
<td>U1</td>
<td>4</td>
<td>Panel width + 4&quot;</td>
<td>Panel width + 4&quot;</td>
</tr>
<tr>
<td>U2</td>
<td>4</td>
<td>Dim. B - 4&quot;</td>
<td>Dim. B - 4&quot;</td>
</tr>
<tr>
<td>U3</td>
<td>4</td>
<td>Dim. C - 4&quot;</td>
<td>Dim. C - 6&quot;</td>
</tr>
</tbody>
</table>

Bars 4A & 4B
Dowel Bar 4D
Bar 4U1
Bar 4U2
Bar 4U3

C-I-P Coping Used with Precast Coping

Note: When precast coping units do not fit the entire length of the retaining wall, use this similar C-I-P coping for short portions between precast coping units. This C-I-P coping may also be used for vertical copings.

**S** = Slightly Aggressive
**M** = Moderately Aggressive
**E** = Extremely Aggressive

Recess Varies
(1'-3" Max., 2" Min.)

Field cut Bars 4A to maintain minimum cover for Extremely Aggressive Environments

Top of C-I-P Coping Enclosure

Edge of C-I-P Coping Enclosure

Edge of Retaining Wall End Panel

Leveling Pad for MSE Wall Shown

Drainage Ditch when required (see Wall Control Drawings for details)

Recess Varies
(1'-3" Max., 2" Min.)

Field cut as required to maintain 2" minimum cover

Top of C-I-P Retaining Wall End Panel

* 2" Cover (Top & Sides)

** For Slightly and Moderately Aggressive environments

** For Extremely Aggressive environments

2" Min. Cover (Typ.)

W Chamfer (Typ.)

3" Cover (Top & Sides)

6" Min. (Match Precast Dimensions)

4A

* For Slightly and Moderately Aggressive environments

** For Extremely Aggressive environments

1'-0" Min. (Match Precast Dimensions)

2'-0" Min. (Match Precast Dimensions)

3" Min. Overlap

4" Cover (Bottom)

C-I-P Coping Enclosure Detail

Section C-C

MSE Wall Coping (Precast or C-I-P)

FY 2017-18
Design Standards

Index No. 6100

Sheet No. 2 of 2
**Partial Plan View for F-Shape Traffic Railing**

(Skewed Approach Slab Shown, Perpendicular Approach Slab Similar) (Precast Coping Shown, C-I-P Coping Similar) (Traffic Railing not Shown for Clarity)

**Junction Slab Notes:**

1. When a 42" F-Shape Traffic Railing is used with precast copings, provide Bars 3D @ 8" spacing between Bars 5V2 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 moderately 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 plumb and perpendicular or radial to the Gutter Line.
6. Provide and install Preformed Expansion Joint Filler in accordance with Specification Section 932.
7. Provide Class II concrete for slightly aggressive environments or Class IV for moderately or extremely aggressive environments.
8. Construct 1/2" V-Grooves in junction slabs and C-I-P copings at 30'-0" maximum intervals as shown. Space V-Grooves equally between 1/2" 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 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 with this Index with the following:
   - Index 230 - Traffic Railing - (32" F-Shape)
   - Index 245 - Traffic Railing - (42" F-Shape)
13. The following Indexes contain details of the intersection of the retaining wall at approach slabs:
   - Index 29060 - Approach Slabs (Flexible Pavement Approaches)
   - Index 29100 - Approach Slabs (Rigid Pavement Approaches)

**Cross Reference:** For Detail 'A', see Sheet 2.
NOTE: See Index No. 420 and Index No. 425, Detail "A" for details.

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.

F-Shape TRAFFIC RAILINGS

C-I-P Buildup Concrete
(MSE Walls only)

8. Angle varies ~ 0° min., 20° max.
7. When the air gap between the precast coping extension and retaining wall exceeds 2", fill gap with full depth Expanded Polystyrene to provide a maximum 2" air gap.
6. Contractor to maintain stability of precast coping/traffic railing prior to junction slab couplers shall develop 125% of the bar yield strength.
5. At the Contractor's option, mechanical couplers may be used to splice reinforcing.
4. Minimum length of Junction Slab between expansion joints is 30'-0".
3. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
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.
1. Match Cross Slope of Travel Lane or Shoulder.
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.

PLAN VIEW
(Skewed Approach Slab shown, Perpendicular Approach Slab 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)
**SECTION A-A**
(TYPICAL SECTION PRECAST COPING WITHOUT CURB)

1'-6½" Min.

**SECTION A-A**
(TYPICAL SECTION C-I-P COPING WITHOUT CURB)

1'-6½" Min.

**SECTION B-B**
(TYPICAL SECTION WITH CURB)
(Precast Coping Shown, C-I-P Coping Similar)

1'-6½" Min.

**SECTION C-C**
(TYPICAL SECTION TRANSITION COPING)
(Precast Coping shown, C-I-P Coping similar)

1'-6½" Min.

**SECTION D-D**
(END VIEW D-D)

1'-6½" Min.

**INDEX NO. 424**
Traffic Railing - (Corral Shape)
Bars 7P1 (See Note 4)

Bars 4P5 (See Note 4)
Bars 4S3 (See Note 4)

Bars 4V1 (See Note 4)

Bars 5B1 (Typ.)
Bars 5B2 (Typ.)

**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. 423 for Traffic Railing details and Bars 7P1, 4P5, 4R3, 4S3 & 4V1. Bars 5R2 and 5U are not required in Retaining Wall Coping.

**CURB JOINT SEALANT DETAIL**

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

1. When a 42" Vertical Shape Traffic Railing is used with a precast coping, increase Bars 4C to Bars 5C or provide Bars 4C @ 6" spacing 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 moderately 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 ½" Expansion Joints in raised sidewalk and C-I-P copings perpendicular or radial to the Gutter Line. Provide at 90'-0" maximum intervals as shown.

6. Shear Keys in Junction Slab are required when GFRP bars are used for Dowel Transfer Devices and are optional with steel dowel bars. Tongue Slope on Shear Key must be constant or radial to the Gutter Line. Provide at 90'-0" maximum intervals as shown.

7. Provide and install Preformed Expansion Joint Filler in accordance with Specification Section 922.

8. Construct ½" V-Grooves in raised sidewalk and C-I-P coping at 30'-0" maximum intervals as shown. Space V-Grooves equally between ½" Expansion Joints and/or Begin or End Raised Sidewalk V-Groove locations to coincide with V-Groove locations in the Traffic Railing.

9. Spacing shown is along the Gutter Line.

10. Dowel Load Transfer Devices in Precast Coping: 1'-0" 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 build up concrete. See Wall Company Drawings for number and spacing of Dowel Load Transfer Devices.

11. Shear Keys in Junction Slab are required when GFRP bars are used for Dowel Transfer Devices and are optional with steel dowel bars. Tongue Slope on Shear Key must be constant or radial to the Gutter Line. Provide at 90'-0" maximum intervals as shown.

12. Finish Sidewalks in accordance with Specification Section 522.

13. Work this Index with the following:
   - Index No. 422 – Traffic Railing – (32" Vertical Shape)
   - Index No. 423 – Traffic Railing – (42" Vertical Shape)
   - Index No. 20900 – Approach Slabs (Flexible Pavement Approaches)
   - Index No. 20910 – Approach Slabs (Rigid Pavement Approaches)

CROSS REFERENCE: For Detail "M", see Sheet 2.
**PRECAST COPING**

**DETAIL "B"**

(Shown Locations of ½" V-Grooves and ½" Preformed Expansion Joint Filler)

**C-I-P COPING**

The above concrete quantities are based on a Type D Concrete Curb (See Note 2).

**TYPICAL SECTION THRU PRECAST COPING WITH C-I-P RAISED SIDEWALK AND RETAINING WALL AT EXPANSION JOINTS**

**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. 5'-11" dimension is based on a 32" Vertical Shape Traffic Railing with a Type D curb adjacent to a 8'-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 & 5X and Bullet Railing details. Adjust vertical dimension of Bars 5T and 5X, see Reinforcing Steel Note 5.
4. Trim end of Bars 5T and 5X to clear construction joint for 42" Vertical Shape Traffic Railing.
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. Mechanical couplers shall develop 125% of the bar yield strength.
6. Contractor to maintain stability of precast coping prior to junction slab completion.
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.

**VERTICAL SHAPE TRAFFIC RAILINGS**

**WALL COPING WITH TRAFFIC RAILING/RAISED SIDEWALK**

**INDEX NO.**

1103

**SHEET NO.**

2 of 3

**FY 2017-18 DESIGN STANDARDS**
REINFORCING STEEL BENDING DIAGRAMS - RAISED SIDEWALK

BILL OF REINFORCING STEEL

REINFORCING STEEL NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at expansion joints will have a 2" minimum cover.
3. Lap splices for Bars 5A with Bars 4C. Lap splices will be a minimum of 2'-2".
4. Lap splices for Bars 5B will be a minimum of 2'-2".
5. See Index No. 422 and Index No. 423 for Bars 5S, 5T & 5X and Bullet Railing details. Adjust vertical dimension of Bars 5S and 5X, see Reinforcing Steel Note 5.
6. Dimension shown is for lap splice option. For mechanical coupler option, this dimension is 1'-8".
7. Dimension shown is for lap splice option. For mechanical coupler option, this dimension is 5'-8", and reinforcing size must be increased to #5 bars (Bars 5C).
8. The Contractor may use deformed WWR when approved by the Engineer. WWR must meet the requirements of Specification Section 931.

ESTIMATED QUANTITIES FOR C-I-P COPING

ITEM | UNIT | QUANTITY
--- | --- | ---
Concrete | CY/LF | 0.326
Reinforcing Steel (Typical) excluding Bars 5T, 5X and 5S (Typ.) | LB/LF | 35.03
Additional Rein. @ Expansion Joints (Steel Dowels) | LB | 32.04

The above concrete quantities are based on a Type A Concrete Curb on a level Retaining Wall (See Note 1).

NOTES:
1. Match roadway curb shape (Type) and height. See Roadway Plans and Index No. 300. 6'-8" dimension is based on a 32" Vertical Shape Traffic Railing with a Type 0 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.
2. See Index No. 422 and Index No. 423 for Bars 5S, 5T & 5X and Bullet Railing details. Adjust vertical dimension of Bars 5T and 5X, see Reinforcing Steel Note 5.
3. If slip forming is used, submit shop drawings for approval showing 3" side cover with the Typical Section dimensions adjusted.

VERTICAL SHAPE TRAFFIC RAILINGS

INDEX NO. 6120

WALL COPING WITH TRAFFIC RAILING/RAISED SIDEWALK

DESIGN STANDARDS

FY 2017-18

LAST REVISION 01/01/16

DESCRIPTION:

BUILDUP FOR STEPPED MSE WALL PANELS AND C-I-P COPING

NOTES:
1. Match roadway curb shape (Type) and height. See Roadway Plans and Index No. 300. 6'-8" dimension is based on a 32" Vertical Shape Traffic Railing with a Type 0 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.
2. See Index No. 422 and Index No. 423 for Bars 5S, 5T & 5X and Bullet Railing details. Adjust vertical dimension of Bars 5T and 5X, see Reinforcing Steel Note 5.
3. If slip forming is used, submit shop drawings for approval showing 3" side cover with the Typical Section dimensions adjusted.
PRECAST COPING/PARAPET AND SIDEWALK NOTES:

1. Provide Class II concrete for slightly aggressive environments or Class IV for moderately or extremely aggressive environments.

2. Construct 3/8" Expansion Joints in sidewalk and C-I-P coping plumb and either perpendicular or radial to the Gutter Line. Provide Expansion Joints at 90'-0" maximum intervals as shown.

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

4. Construct 1/2" V-Grooves in sidewalk and C-I-P coping. Space V-Grooves at 30'-0" Maximum intervals equally spaced between 3/8" Expansion Joints and/or Begin or End Sidewalk. For C-I-P Coping only, V-Groove locations are to coincide with V-Groove locations in the Concrete Parapet.

5. Spacing shown is along the Gutter Line.

6. For Precast Coping only, provide Dowel Bars 4D embedded 1'-0" and extend 11" 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.

7. Work this Index with Index No. 420 - Concrete Barrier Wall.

8. For C-I-P Coping only, work this Index with Index No. 820 - Pedestrian/Bicycle Railing.

9. Finish Sidewalks in accordance with Specifications Section 522.

10. The following Indexes contain details of the intersection of the retaining wall at approach slabs:
    - Index No. 20900 - Approach Slabs (Flexible Pavement Approaches)
    - Index No. 20910 - Approach Slabs (Rigid Pavement Approaches)

PARTIAL PLAN VIEW
(Skewed Approach Slab Shown, Perpendicular Approach Slab Similar)
(Precast Coping Shown, C-I-P Coping Similar) (Concrete Parapet not Shown for Clarity)

PARTIAL ELEVATION VIEW
(Precast Coping and Sidewalk Reinforcing not Shown for Clarity)
(Precast Coping Shown, C-I-P Coping Similar)
LIGHT POLE PEDESTAL NOTES:

1. The pedestal and junction slab are designed to resist the following working loads from the light pole applied at the top of the pedestal:
   - Axial Deadload = 1,500 kip
   - Wind load Moment about Transverse Axis (*) = 40.60 kip-ft
   - Wind load Moment about Longitudinal Axis (*) = 28.30 kip-ft
   - Dead load Moment about Longitudinal Axis (*) = 1,690 kip-ft
   - Maximum Shear = 1,380 kip
   - Torque about Pole Axis (*) = 2,560 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 shown must be signed and sealed by the Contractor's Specialty Engineer and submitted to the Engineer for approval prior to construction.
5. For conduit, EJB and expansion/deflection fitting details, see Utility Conduit Detail Drawings.
6. The cost of anchor bolts, nuts, washers and anchor plates will be included in the Bid Price for Light Poles. Include the cost of all labor, concrete and reinforcing steel required for construction of the pedestals, EJB and miscellaneous hardware required for the completion of the electrical system in the Bid Price for either the Traffic Railing or Concrete Parapet that the pedestal is behind.
7. Field Cut Bars 4M2 as required to maintain clearance.
8. Slip Forming Method of construction requires the Engineer's approval within the limits shown.
9. Reinforcing shown for light pole pedestals is in addition to typical reinforcing for Junction Slabs and Raised Sidewalks.
10. Work this Index with the following as appropriate:
    - Index No. 5212
    - Index No. 6110
    - Index No. 6120
    - Index No. 6130
11. Pedestal may be precast in one section with Coping. Minimum Precast Coping section length is 10 ft. or 12 ft for combination Precast Traffic Railing and Coping section.
12. For Estimated Quantities, see Sheet No. 6.
13. Unless otherwise noted, Traffic Railing (32" F-Shape) is shown in all Views and Sections. The Pedestal details for other traffic railings or pedestrian/bicycle railings are similar.
NOTES:
1. Provide Concrete Slab to match adjacent coping.
2. For junction slabs, increase the 1'-0" depth dimension to 1'-9".
3. For sidewalks, see Index No. 6130 for C-I-P Coping, but increase 6" depth dimension to 1'-6".
4. The minimum length of the Junction Slabs, raised sidewalks and sidewalks is 30'-0", measured along the Gutter Line.
5. Bars 4J are only required when pedestals are behind a Traffic Railing or Traffic Railing/Noise Wall.
6. Top of junction slab may be thinned to match finished grade of concrete pavement or shoulder, or top of sidewalk or raised sidewalk (See Notes 3 & 4).
7. Actual width varies depending on type of retaining wall used.
8. See Index No. 6110 for Bars 5V2 and 5S, or Index 5212 for Bars 5V and 5S1.

TYPICAL SECTION AT LIGHT POLE PEDESTAL
(Junction Slab Shown, Raised Sidewalk or Sidewalk Similar)


**REINFORCEMENT STEEL BENDING DIAGRAMS - LIGHT POLE PEDESTAL**

**BILL OF REINFORCEMENT STEEL**

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**ELEVATION VIEW**

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

(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 pedestal will not exceed anchor bolt diameter.

**DETAIL "A"**

- Top of Traffic Railing
- Top of recess & Bottom at Junction Slab
- 2" Cover (Top & Sides)
- 4" Cover (Bottom)
- 2'-0" (Length of 1'-9" Thick Junction Slab)
- Varies (Transition to 1'-9" Thick Junction Slab)

**REINFORCEMENT STEEL NOTES:**

1. All bar 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 (WWR) when approved by the Engineer. WWR must consist of deformed wire meeting the requirements of Specification Section 931.

**ESTIMATED QUANTITIES**

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<tr>
<td>Reinforcing Steel</td>
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(The quantities above are for one C-I-P Light Pole Pedestal. The concrete quantity for the thickened junction slab is based on a 5'-0" length, 9" increase in thickness and a 5" wide retaining wall panel. Adjust thickened concrete quantity as required.)
PLAN VIEW

(Section Slab Shown, Raised Sidewalk Similar)

SECTION A-A

SECTION THRU JUNCTION SLAB, BARRIER WALL INLET AND RETAINING WALL

(Junction Slab Shown, Raised Sidewalk Similar)

Notes:
1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at open joints will have a 2" minimum cover.
3. See Index Nos. 6110, 6120 & 6130 for Bars 4A (or 5A), 5B, 5C and 4L (or 5L).
4. 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.
5. Organic Felt bond breaker (Top) & Expanded Polystyrene shown hatched (1/8" Each Side).
6. Locate Barrier Wall Inlet a minimum of 10'-0" away from Expansion Joints in Slabs, Raised Sidewalks, C-1-P Coping and Traffic Railing or Concrete Parapet.
7. Work this Index with the following as appropriate:
   - Index No. 6110
   - Index No. 6120
   - Index No. 6130

Spacing shown is along the Gutter Line. Spacing shown is for C-1-P Junction Slab. For C-1-P Raised Sidewalks or Sidewalks, match bar spacing and size shown in Typical Sections (i.e., 11 ~ Bars 5U2 and 15 ~ Bars 4S2 @ 6" spacing for Raised Sidewalks). Dimensions shown are for junction slab. Increase width as required for C-1-P Raised Sidewalk and Sidewalks. Actual location & width vary depending on type of Retaining Wall used.

INDEX NO. 6201

REINFORCING STEEL BENDING DIAGRAMS - DRAINAGE

BILL OF REINFORCING STEEL

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STIRRUP BAR 452

BAR 553

BAR 6U2

BAR 5U3

REINFORCING STEEL NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at open joints will have a 2" minimum cover.
3. See Index Nos. 6110, 6120 & 6130 for Bars 4A (or 5A), 5B, 5C and 4L (or 5L).
4. 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.