GENERAL NOTES

1. Work this Index with the Noise Wall Data Tables, and Wall Control Drawings in the Plans.

2. Construct Noise Walls in accordance with the requirements of Specification Section 334, and Auger Cast Piles in accordance with Specification Section 455.

3. Field verify the location of all overhead and underground services shown in the Wall Control Drawings.

4. Wall Height is the nominal height of the walls above finished grade. The Wall Embedment Depth for design is 1'-0". The actual embedment depth may vary plus or minus 6" along the length of the wall.

5. Post Spacing in this Index are nominal, and are measured from centerline to centerline of the auger cast piles. Actual post spacing may vary as shown in the Wall Control Drawings.

6. Panels:
   A. The sum of the individual stacked panel heights is the Wall Height plus 1'-0" (embedment depth).
   B. Where special graphics are required, locate the horizontal panel joints outside of the graphics. Where possible, hold horizontal panel joints at a constant elevation.
   C. Side installed Panels are only permitted when reduced overhead clearance between posts prohibits installing panels from the top.
      1. For Flush Face panels, install panel into posts from the roadway (front face) of the wall. Recessed panels may be installed from the back face of the wall.
      2. After panels are installed and centered between posts, grout between both panel ends and the adjoining posts (see Sheets 4 and 5 for details).
   D. Individual panel heights should be between 6'-0" and 12'-0" tall. The minimum panel height is 4'-0" and may be used where overhead clearance is limited, or where graphic panels are required on shorter walls.

7. Concrete And Grout:
   A. Concrete Class and Compressive Strength for:
      1. Precast Panels, Posts, and Post caps: Class IV (fc' = 5500 psi)
      2. Cast-In-Place Collars: Class IV (fc' = 5500 psi)
   B. Minimum Compressive Strength for form removal and handling of posts and panels:
      1. 2,500 psi for horizontally cast post and panels
      2. 2,000 psi for vertically cast panels or when tilt-up tables are used for horizontally cast panels.
   A. Grout for Auger Cast Piles:
      1. Maximum Working Compressive Strength = 2,000 psi
      2. Minimum 28 day strength = 5,000 psi

8. Reinforcing Steel:
   A. In addition to the requirements of Specification Section 415, tie post and pile stirrups at the following locations as a minimum.
      1. Post Stirrups Tie at all four corner bars and at every third interior bar intersection.
      2. Pile Stirrups Tie to the main vertical reinforcing at alternate intersections for circular configurations and at the four corners and at every third interior bar intersection for rectangular configurations.
   B. Provide 2" concrete cover unless noted otherwise.

9. Casting Tolerances for precast panels and posts:
   A. Overall Height and Width: +/- ¼" 
   B. Thickness: +/- 1/16" 
   C. Plane of side mold: +/- 1/16" 
   D. Openings: +/- 1/16" 
   E. Out of Square: 1/8" per 6 ft., but not more than 3/16" total along any side 
   F. Warping: 1/16" per foot distance to nearest corner 
   G. Bowing: 1/240 panel dimension 
   H. Surface Smoothness for Type "A"Smooth Surface Texture Option: +/- 1/16" 

10. Provide Fiber Reinforced Neoprene pads with a Durometer Hardness between Grade 50 and 80, or Plain Neoprene Pads with a minimum Durometer Hardness of Grade 50 in accordance with Specification Section 932.
   A. For Collar Bearing Points provide:
      1. 4"x 4"x ½" Fiber Reinforced Pads;
      2. Plain Pads with a may be substituted for Fiber Reinforced Pads when sufficient bearing area is available on the concrete collar for the following:
         a. 10' Post Spacing: 4"x 4"x ½" 
         b. 20' Post Spacing and Wall Height < 17 feet: 4"x 4"x ½" 
         c. 20' Post Spacing and Wall Height ≥ 17 feet: 4"x 5"x ½" 
   B. At panel bearing points between stacked panels, use Plain or Fiber Reinforced Neoprene Pads.
Notes:

1. Surfaces shall be formed, rolled, or pressed using form liners in accordance with the Plans and Specifications for Class 3 Surface Finish.

2. See Noise Wall Data Tables for project aesthetic requirements.
HALF ELEVATION
(Front Face Post and Panel Texture Type "H" shown)
(Graphic Type SE-2 shown)
(Two stacked panels shown, three stacked panels similar)

NOTES:
1. Submit specific form liner samples for approval by the Engineer.
2. Textures and graphics shown are for demonstration purposes only. See Noise Wall Data Tables in the plans for project specific texture and graphic requirements.
**TYPICAL PANEL ELEVATION**

- *In lieu of utilizing the standard pick up points below, panels may be cast vertically or cast horizontally then tilted upright using tilt-tables prior to lifting from form. In this case, pick points must be placed in the top of panels only and transported maintaining the vertical orientation. If these criteria are met, the vertical steel may be reduced to #4 Bars @ 1'-3" (As=0.16 in.²/ft.).*

**STANDARD PICK UP POINTS FOR PANELS**

- Panels shall be rotated about long axis only.

**SECTION C-C**

- See Detail "A" - SIDE-INSTALLED (Typical both ends)
- See Detail "B" - TOP-INSTALLED (Typical both ends)

**SECTION D-D**

- See Detail "A" - TOP-INSTALLED (Typical both ends)
- See Detail "B" - TOP-INSTALLED (Typical both ends)

**DETAIL "A" - SIDE-INSTALLED**

- See Detail "B" - TOP-INSTALLED (Typical both ends)

**Notes:**
1. See Sheet 3 for allowable methods of applying textures.
2. See plans for panel type and aesthetic requirements.
3. For equal post spacing, side-installed panel length will be shorter than top-installed panel length.
NOTE:
The shop drawings shall include specific pivoting details of panel ends at locations where the deflection angle (2Δ°) between panels exceeds 7°.

TYPICAL PANEL DETAILS

PIVOTING DETAILS
(Flush Type Panel)

See Detail "C" for panel dimensions

See Detail "D" for panel dimensions

CASE 1
(Interior Angle)

CASE 2
(Exterior Angle)

NOTE:
The shop drawings shall include specific pivoting details of panel ends at locations where the deflection angle (2Δ°) between panels exceeds 20°.

TYPICAL PANEL DETAILS

PIVOTING DETAILS
(Recessed Type Panel)

See Detail "E" (Exterior Angle)

See Detail "E" (Interior Angle)

See Detail "E" (Exterior Angle)

See Detail "E" (Interior Angle)

DETAIL "D"

DETAIL "C"

DETAIL "E"
(Back Face Chamfer Shown Front Face Chamfer Similar)
DRAINAGE HOLES TYPES A, B, C & D
(Front Face of Wall Shown)
(Two Holes Shown, One Hole Similar)

*L* Hole Types A, B, C and D refer to distance from bottom of panel to center of opening. See Wall Control Drawings in the plans.

DRAINAGE HOLE DETAILS

BAR BENDING DETAILS (#3 Bars)

GRATING NOTES:
1. Grating shall be ASTM A36 steel welded in accordance with the current edition of ANSI/AWS D1.1 Steel Welding Code. Hot-dip galvanize grates after fabrication in accordance with Specification Section 962.
2. Expansion anchors: Use 1/2" Ø x 3" ASTM A307, vandal resistant, hot-dip galvanized expansion anchors to connect grates to panels.
3. Grating mounted to back face of wall.

DRAINS THEM TYPES A, B, C & D
(Front Face of Wall Shown)
(Two Holes Shown, One Hole Similar)
LOW CLEARANCE OPTION

* Extend Post 2' above top of high side wall panel when post caps are shown in plans. See Sheet 4, "ELEVATION STEP AT TOP OF WALL".

NOTES:
1. For Post Reinforcing see Sheets 15 and 16.
2. For Pile Lengths Tables see Sheets 15 and 16.
**POST PLACEMENT & PILE REINFORCING STEEL DETAILS**

**TYPICAL POST**

- **STANDARD POST PLACEMENT IN AUGER CAST PILE**
  - (H-Post Shown, 45° Corner Posts Similar)

**LOW CLEARANCE OPTION**

- **EXPOSED PRECAST POST REINFORCEMENT (Typ.)**
- **Top of Precast Collar, Elev. A**
- **Pile Length (See Note 1)**
- **Bottom of Augered Collar, Elev. A**
- **Precast Post**
- **Precast Post & Pile**
- **Post & Pile**
- **Top of Wall**
- **Auger Cast Pile**
- **Auger Cast Pile**
- **Bars P3 (Typ.)**
- **Bars P3 (Typ.)**
- **Extruded Precast Post Hole per Plan**
- **Finished Grade**
- **Projected Location of Bearing Pad (Typ.)**
- **See Section P-P**
- **10 - #9 Bars (Typ.), Bars P3 spaced equally around Bar P3 (Typ.)**

**NOTE:**
1. For Pile Length Tables, see Sheets 15 and 16.

**SECTION M-M**

- **30" Ø Auger Cast Pile**
- **30" Ø Auger Cast Pile**
- **36" Ø Auger Cast Pile**
- **36" Ø Auger Cast Pile**
- **Post & Pile**
- **Post & Pile**
- **Post, Pile & Wall**
- **Projected Location of Bearing Pad (Typ.)**
- **See Sheet 1, Note N**

**SECTION N-N**

- **36" Ø Auger Cast Pile**
- **36" Ø Auger Cast Pile**
- **Post & Pile**
- **Post & Pile**
- **Post, Pile & Wall**
- **Projected Location of Bearing Pad (Typ.)**
- **See Sheet 1, Note N**

**SECTION P-P**

- **Low Clearance Option**
- **Post, Pile, & Wall**
- **Post, Pile, & Wall**
- **Bars P3**
- **30" Ø Auger Cast Pile**
- **30" Ø Auger Cast Pile**
- **Projected Location of Bearing Pad (Typ.)**
- **See Sheet 1, Note N**

**STANDARD POST PLACEMENT IN AUGER CAST PILE**

* Extend Post 2" above top of high side wall panel when post caps are shown in plans. See Sheet 4, "ELEVATION STEP AT TOP OF WALL".

* Top of Wall

30" Ø or 36" Ø Auger Cast Pile

Projected Location of Bearing Pad (Typ.)
(See Sheet 1, Note N)

NOTE:
1. For Pile Length Tables, see Sheets 15 and 16.
1. Reference Sheets 8 & 9 for location of Sections.
2. Space Bars P7 as shown for Bars P1.
3. Space Bars P8 as shown for Bars P2.
4. Match texture thickness with appropriate Panel face.
5. For Post Reinforcing, see sheets 15 & 16.
6. For Pile Length Tables, see sheets 15 & 16.
**TYPICAL POST**

* Top of Wall

- Bars A
- Bars B
- Bars P4 (Typ.)

**SECTION R-R**

- Bars P4 @ 1'-0" Max.
- Bars A and Bars B
- Bars P5 (Pairs) @ 7-3/4" Max.

**SECTION S-S**

- Bars P4 @ 5 equal sp.
- 2" Cover (Typ.)
- 3/8" Chamfer

**LOW CLEARANCE OPTION**

* Extend Post 2" above top of high side wall panel when post caps are shown in plans. See Sheet 4, "ELEVATION STEP AT TOP OF WALL".

**90° CORNER POST DETAILS**

1. For Post Reinforcing, see Sheets 15 and 16.
2. For Pile Length Tables, see Sheets 15 and 16.
3. Reduce typical panel length or adjust pile spacing at each 90° Corner Post.
4. Match texture thickness, with appropriate Panel Face.

**90° CORNER POST REINFORCEMENT**

(Post Surface Features Not Shown For Clarity)
NOTES:
1. For Pile Length Tables, see Sheets 15 and 16.
2. Trowel Finish top of auger cast pile to allow placement of Bearing Pads.
   * Extend Post 2' above top of high side wall panel when post caps are shown in plans. See Sheet 4, "ELEVATION STEP AT TOP OF WALL".
PRECAST POST CAPITAL

PRECAST NOISE WALLS

PLAN VIEW
(Type "A" Cap Shown, Type "B" & "C" Caps Similar)

SECTION C-C
TYPE "A" CAP DETAILS

PICTORIAL VIEW

VIEW A-A SHOWN, VIEW B-B SIMILAR
(Type "A" Cap Shown, Type "B" & "C" Caps Similar)

SECTION C-C
TYPE "B" CAP DETAILS

PICTORIAL VIEW

SECTION C-C
TYPE "C" CAP DETAILS

PICTORIAL VIEW

CAP PLACEMENT DETAIL
(Type "B" Cap Shown, Type "A" & "C" Caps Similar)
### TABLE 1A - TABLE OF POST REINFORCING STEEL

<table>
<thead>
<tr>
<th>WALL HEIGHT (Feet)</th>
<th>POST LENGTHS</th>
<th>10'-0&quot; POST SPACING</th>
<th>20'-0&quot; POST SPACING</th>
<th>WALL HEIGHT (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WITH CAP</td>
<td>BARS A</td>
<td>BARS B</td>
<td>BARS C</td>
<td>BARS D</td>
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<td>23'-0&quot;</td>
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<td>#6</td>
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### TABLE 1B - PILE LENGTHS (Feet) - WIND SPEED = 110 MPH

<table>
<thead>
<tr>
<th>SOIL POSTS</th>
<th>10'-0&quot; POST SPACING</th>
<th>20'-0&quot; POST SPACING</th>
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</thead>
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<tr>
<td>SOIL POSTS</td>
<td>30&quot;</td>
<td>36&quot;</td>
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<tr>
<td>SOIL 1</td>
<td>30&quot;</td>
<td>36&quot;</td>
</tr>
<tr>
<td>SOIL 2</td>
<td>30&quot;</td>
<td>36&quot;</td>
</tr>
</tbody>
</table>

### TABLE NOTE:
1. Bars D and Bars 6 are for 45° Corner Posts only.
2. See Contract Plans for project wind speed.
4. Soil 2 = Medium Dense Granular Soil, N = 10 to 40.

---

**Bar Bending Details**

All bar dimensions in bending diagrams are out-to-out. All bars not shown in the bending diagrams are straight.

**Standard Post (#4 Bars)**

**Pile (Low Clearance) (#4 Bars)**

**45° Corner Post (#4 Bars)**

---

**Design Standards**

**Precast Noise Walls**

**Index No.**

**Sheet No.**

**Description:**

2016

**Last Revision:**

07/10/15
### TABLE 2A - TABLE OF POST REINFORCING STEEL

<table>
<thead>
<tr>
<th>WALL HEIGHT (Feet)</th>
<th>POST LENGTHS</th>
<th>10'-0&quot; POST SPACING</th>
<th>20'-0&quot; POST SPACING</th>
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<tbody>
<tr>
<td></td>
<td>WITHOUT CAP</td>
<td>WITH CAP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BARS A</td>
<td>BARS B</td>
<td>BARS C</td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
<td>DIM (Feet)</td>
<td>DIM (Feet)</td>
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### TABLE 3A - TABLE OF POST REINFORCING STEEL

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<th>WALL HEIGHT (Feet)</th>
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<tr>
<td></td>
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<td>WITH CAP</td>
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</tr>
<tr>
<td></td>
<td>BARS A</td>
<td>BARS B</td>
<td>BARS C</td>
</tr>
<tr>
<td></td>
<td>SIZE</td>
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### TABLE 2B - PILE LENGTHS (Feet) - WIND SPEED = 130 MPH

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### TABLE 3B - PILE LENGTHS (Feet) - WIND SPEED = 150 MPH

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<td>30'</td>
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</tbody>
</table>

**TABLE NOTE:**
1. Bars B and Bars C are for 40' Corner Posts only.
2. See Contract Plans for project wind speed.
   Soil 2 = Medium Dense Granular Soil, N = 10 to 40.

**DESCRIPTION:**
2016 DESIGN STANDARDS

**APPLICATION:**
PREFABRICATED NOISE WALLS

**PRECAST NOISE WALLS**

**INDEX NO.:** 5200

**SHEET NO.:** 16 of 16
PLAN (BRIDGE MOUNTED RAILING/NOISE WALL SHOWN, WALL OR FOOTING MOUNTED RAILING/NOISE WALL SIMILAR) (Reinforcing Steel not shown for clarity)

ELEVATION OF INSIDE FACE OF RAILING/NOISE WALL (BRIDGE MOUNTED RAILING/NOISE WALL SHOWN, WALL OR FOOTING MOUNTED RAILING/NOISE WALL SIMILAR) (Reinforcing Steel not shown for clarity)

* On Bridges see Superstructure and Approach Slab Sheets for actual dimensions and joint orientation. Open Railing/Noise Wall Joints at Deck Expansion Joint locations shall match the dimensions of the Deck Joint.

For treatment of Railing/Noise Walls on skewed bridges see Index No. 420. Deck Joint at Begin Bridge or End Bridge shown. Deck Joint at 4 Pier or Intermediate Bent, Junction Slab or Footing similar.

** 3/4" Intermediate Open Joints shall be constructed plumb and provided at:

1) Superstructure supports where slab is continuous.
2) Construction Joints for Junction Slabs and Footings.

CROSS REFERENCE:
For Section C-C and Detail "A" see Sheet 5.
For Wall mounted Railing/Noise Wall Details see Index Nos. 5213 (T-Shaped), 5214 (L-Shaped) or 5215 (Trench).
For Footing mounted Railing/Noise Wall Details see Index No. 5210.
For Section C-C and Detail "A" see Sheet 5.
For Wall mounted Railing/Noise Wall Details see Index Nos. 5213 (T-Shaped), 5214 (L-Shaped) or 5215 (Trench).
For treatment of Railing/Noise Walls on skewed bridges see Index No. 420. Deck Joint at Begin Bridge or End Bridge shown. Deck Joint at 4 Pier or Intermediate Bent, Junction Slab or Footing similar.

** 3/4" Intermediate Open Joints shall be constructed plumb and provided at:

1) Superstructure supports where slab is continuous.
2) Construction Joints for Junction Slabs and Footings.
TRAFFIC RAILING/NOISE WALL NOTES

CONSTRUCTION REQUIREMENTS - The Traffic Railing/Noise Wall and joints shall be constructed plumb. They shall not be constructed perpendicular to the roadway surface. Slip forming is not permitted.

CONCRETE - For Railing/Noise Wall on bridges see General Notes. For Wall and Footing mounted Railing/Noise Wall, concrete shall be Class II for slightly aggressive environments and Class IV for moderately or extremely aggressive environments.

NAME, DATE AND BRIDGE NUMBER - For Railing/Noise Wall on bridges, the name and bridge number shall be placed on the Traffic Railing so as to be seen on the driver's right side when approaching the bridge. The Date shall be placed on the driver's left side when approaching the bridge. The Name shall be as shown in the Notes in the Structures Plans. The Date shall be the year the bridge is completed. For a widening when the existing railing is removed, use both the existing date and the year of the widening. Black plastic letters and figures 3" in height may be used, as approved by the Engineer, in lieu of the letters and figures formed by V-Grooves. V-Grooves shall be formed by preformed letters and figures.

BARRIER DELINERATORS: Barrier Delineators shall meet Specification Section 993. Install Barrier Delineators 2'-4" above the riding surface at the spacing shown in the table below. Barrier Delineator color (white or yellow) shall match the color of the near edgeline. The cost of the Barrier Delineators shall be included in the Contract Unit Price for the Traffic Railing/Noise Wall.

INTERMEDIATE JOINT SEAL NOTES:
1. All Intermediate Open Joints, seal the lower 6" portion of the open joint with Pre-cured Silicone Sealant in accordance with Specification Section 932.
2. Apply sealant prior to any Class V finish coating and remove all curing compound and loose material from the surface prior to application of bondant agent.
3. The cost of the Pre-cured Silicone Sealant shall be included in the Contract Unit Price for the Traffic Railing.

DETAIL "B" - SECTION AT INTERMEDIATE OPEN JOINT

ESTIMATED TRAFFIC RAILING/NOISE WALL QUANTITIES

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<thead>
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(The above quantities are based on the bridge mounted typical section, 2% deck cross slope and railing on low side of deck.)

BILL OF REINFORCING STEEL

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<tr>
<td>S1</td>
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<td>As Rod.</td>
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<tr>
<td>S2</td>
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<tr>
<td>V</td>
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<tr>
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<td>5</td>
<td>7'-7&quot;</td>
</tr>
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(For locations of Detail "B", see Sheet 1.)

TRAFFIC RAILING/NOISE WALL (8'-0")

REINFORCING STEEL BENDING DIAGRAMS

1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints shall have a 2" minimum cover.
3. Bars 5R shall be one continuous or lap spliced bar. No mechanical couplers are permitted.
4. Bars 5S1 may be continuous or spliced at the construction joints. Lap splices for Bars 5S1 and 5S2 shall be a minimum of 2'-2".
5. The Contractor may use Welded Wire Reinforcement (WWR) when approved by the Engineer. WWR shall consist of deformed wire meeting the requirements of Specification Section 931.
6. See Index Nos. 5214 and 5215 for Bars 5R and 5V in L-shaped and Trench footings.

DETAILS:

- Paint Recessed Surfaces Black
- Cross Reference: For locations of Detail "B", see Sheet 1.
ELEVATION OF RAILING/NOISE WALL REINFORCING STEEL
(INTERMEDIATE OPEN JOINT SHOWN, DECK JOINT SIMILAR)
(Bars 5S1 in Railing not shown for clarity)

NOTES:
* Field Cut Bars 5R & 5S1 to maintain clearance.
** Terminate ¾ V-groove at construction joint & cast top of
railing with End Taper
*** Bar spacing shown for Bars 5V applies only to bridge mounted
Railings/Noise Wall. See Index No. 5212 for spacing of Bars 5V
in Junction slabs and Index Nos. 5213 (T-shaped), 5214 (L-shaped)
or 5215 (Trench) for Bars 5V spacing in footings.

ELEVATION OF RAILING/NOISE WALL END TAPER (ADJACENT TO TRAFFIC RAILING
SHOWN, GUARDRAIL ATTACHMENT SIMILAR SEE DETAIL "A", SHEET 5)
(Bars 5S1 in Railing not shown for clarity)
SECTION A-A
TYPICAL SECTION THRU TRAFFIC RAILING/NOISE WALL
(Section Thru Bridge Deck Shown, Section Thru Approach Slab, Junction Slab or Footing Similar)

NOTES:
1. Bottom Bars 5S1 and End Bar 5V are not present in L-Shaped (Index No. 5214) or Trench (Index No. 5215) Footings. For Bridge Mounted installations, see the Superstructure Sheets for Deck Steel.

CROSS REFERENCE:
For locations of Section A-A see Sheet 1.
For location of View B-B, see Sheet 5.

TRAFFIC RAILING/NOISE WALL (8'-0")
END VIEW OF RAILING END TRANSITION FOR GUARDRAIL ATTACHMENT AT END OF APPROACH SLAB
(Flexible Pavement Approach Slab Shown, Rigid Pavement Approach Slab, Junction Slab or Footing Similar)
**DETAIL "A" NOTES:**

1. Rotate Bars 5P & 5V in Railing End Transition to maintain cover. Begin placing Railing Bars 5P and 5V at the railing end and proceed toward the guardrail (thrie beam) terminal connector to ensure placement of guardrail bolt holes. Pair Bars 5R with Bars 5P as shown. Clearance of Bars 5P, 5R & 5V to guardrail bolt holes shall be checked to prevent cutting of bars if holes are to be drilled. Shift bars locally where conflicts occur.

2. For Guardrail connection details see Design Standards Index No. 400.

3. Omit Railing End Transition if a 32" F-Shape Traffic Railing is used beyond the End Taper. See the Plan Sheets. If Railing End Transition is omitted, space Bars 5P, 5R & 5V at 6" as shown above (Typ.)

4. For L-Shaped (Index No. 5214) and Trench (Index No. 5215) footings, Bars 5V and 5T replace Bars 5V as shown at left. Details and bar spacing shown apply except that it is not necessary to rotate Bars 5V and 5T to maintain cover and there is no field cut End Bar 5V.

5. Bottom Bars 5S1 are not present in L-Shaped or Trench Footings.

**PLAN - RAILING END TRANSITION**

(Showing Bars 5P, 5R, and Bars 5S1)  (Bars 5V, Noise Wall & Reinforcement not shown for Clarity)

**PLAN - RAILING END TRANSITION**

(Showing Bars 5V and Bars 5S1)  (Bars 5P, 5R, Noise Wall & Reinforcement not shown for Clarity)

**SECTION C-C**

THRU NOISE WALL END TAPER

**CROSS REFERENCE:**

For location of Detail "A" see Sheet 1. For location of Section C-C see Sheet 1. For View B-B see Sheet 4.
1. This railing has been structurally evaluated to be equivalent or greater in strength to a safety shape/Noise Wall combination railing which has been crash tested to NCHRP Report 350 TL-4 Criteria.

2. CONSTRUCTION REQUIREMENTS: Construct the Traffic Railing/Noise Wall joints plumb and perpendicular to the roadway surface. Slip forming is not permitted.

3. CONCRETE: Use Class II concrete for slightly aggressive environments. Use Class IV concrete for moderately or extremely aggressive environments. Concrete will be in accordance with Specification Section 346.

4. Construct \( \frac{1}{2} \)" Open Joints plumb and perpendicular or radial to Gutter Line. Provide at 90'-0" maximum intervals as shown. \( \frac{1}{2} \)" Open Joint locations are to coincide with \( \frac{1}{2} \)" Expansion Joints in footings.

5. Construct \( \frac{1}{2} \)" V-Grooves plumb and provide at 30'-0" maximum intervals as shown. Space V-Grooves equally between \( \frac{1}{2} \)" Open Joints and/or Begin or End Traffic Railing/Noise Wall. V-Groove locations are to coincide with V-Groove locations in footings.

6. 14'-0" Noise Wall End Taper is required when Railing/Noise Wall is adjacent to an 8'-0" Traffic Railing/Noise Wall and may be used when an 8'-0" Traffic Railing/Noise Wall End Taper is provided (see Index No. 5210 for details). See Roadway Plans for Traffic Railing/Noise Wall End Treatment.

7. Work this Standard Drawing with Index No. 5210 - Traffic Railing/Noise Wall (8'-0") and one or more of the following:
   a. Index No. 5213 - Traffic Railing/Noise Wall T-Shaped Spread Footing,
   b. Index No. 5214 - Traffic Railing/Noise Wall L-Shaped Spread Footing or
   c. Index No. 5215 - Traffic Railing/Noise Wall Trench Footing.
ELEVATION OF TRAFFIC RAILING/NOISE WALL REINFORCING STEEL
(Bars 5S1 in Railing not shown for clarity)

NOTES:
1. Field cut Bars 5R & 5S1 in Noise Wall End Taper as required to maintain minimum cover.
2. See Index Nos. 5211, 5214 and 5215 for footing reinforcement.
3. 3/8" Open Joint may be omitted when 8'-0" Traffic Railing/Noise Wall End Taper is adjacent to a 14'-0" Traffic Railing/Noise Wall End Taper as shown on Sheet 1. See Index No. 5219 for reinforcement details and spacing. Bars 5S2 are not required when 3/8" Open Joint is omitted.
4. Bar spacing shown is along the Gutter Line.
SECTION A-A

TYPICAL SECTION THRU TRAFFIC RAILING/NOISE WALL

REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL

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Concrete (Traffic Railing / Noise Wall) (Typical, excluding Footing Reinforcement)

Concrete (Noise Wall, excluding any thickening)

Reinforcing Steel (Railway/Noise Wall) (Typical, excluding Footing Reinforcement)

Additional Rein. @ Open Joint (Railway/Noise Wall)

REINFORCING STEEL NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints will have a 2" minimum cover.
3. Bars SR may be continuous or spliced at construction joints. Lap splices for Bars SR and S1 will be a minimum of 2'-2".
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.

REMARKS:

1. See Index Nos. 5213, 5214 and 5215 for footing reinforcement.
2. At 18" Open Joints, plug the lower 2" portion of the open joint by filling it with mortar in accordance with Specification Section 400.

ESTIMATED TRAFFIC RAILING BARRIER/NOISE WALL QUANTITIES

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CROSS REFERENCE:
For locations of Section A-A and Detail "A", see Sheet 1.
SECTION B-B

TYPICAL SECTION THRU JUNCTION SLAB AND RETAINING WALL

NOTE: See Index No. 5210, Detail "A" for details.

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. Actual width varies depending on type of Retaining Wall used.
4. See Index No. 5210 for Bars 5V and Bars 5S1.
5. For Rigid Pavement (Concrete), Junction Slab may be thickened to match finished grade.
6. If slip forming is used, submit shop drawings for approval showing 3" side cover with adjusted Typical Section dimensions.

CROSS REFERENCE:
For location of Section B-B, see Sheet 1.
Field Cut Bars 5B as required to maintain minimum cover for skewed approach slab

Field Bend Bars 5A as required to maintain minimum cover

Skewed Approach Slab

3" Open Joint

V-Groove Spacing – 30'-0" Max. (See Note 6) Expansion Joint Spacing – (50'-0" Min., 90'-0" Max.) (See Note 4)

2 Cover @ (Typ.)

Expansion Joint (See Detail this sheet)

14'-0" or 8'-0" Traffic Railing/Noise Wall

Barrier Wall Inlet (Grate not shown for clarity) (See Design Standard Index No. 5218 for details)

Bars 5B (Field Cut as required to clear Barrier Wall Inlet) (Typ.)

3" Cover (Typ. all Sides)

1" Ø Dowel Load Transfer Devices

Expansion Joint (See Detail this sheet)

Bottom of Spread Footing

1" Preformed Expansion Joint Filler (Typ. all Sides)

Top of Spread Footing

Approved metal or fiber cap

Coping

Bottom of Spread Footing

Bottom of Spread Footing (Level Transversely)

Slopes Varies

3" Cover (Bottom)

2' Cover (Top & Sides)

1'-0" Preformed Expansion Joint Filler (Field cut to Clear Inlet)

EXPANSION JOINT DETAIL

(Spread Footing expansion joints are required at ½" open joints in Traffic Railing/Noise Wall)

NOTES

1. CONSTRUCTION REQUIREMENTS: Construct the Spread Footing level transversely and expansion joints plumb, do not construct the spread footing perpendicular to the roadway surface. Slip forming is not permitted.

2. CONCRETE: Use Class II concrete for slightly aggressive environments. Use Class IV concrete for moderately or extremely aggressive environments. Concrete will be in accordance with Specification Section 346.

3. DOWELS: Dowel Load Transfer Devices will be ASTM A 36 smooth round bar and hot-dip galvanized in accordance with Specification Section 962. Install Dowel Load Transfer Devices in accordance with Specification Section 350.

4. Construct 1/2" Expansion Joints plumb and perpendicular or radial to Gutter Line. Provide at 90'-0" maximum intervals as shown.

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

6. Construct ½" V-Grooves plumb and provide at 30'-0" maximum intervals as shown. Space V-Grooves equally between ½" Expansion Joints and/or Begin or End Spread Footing. V-Groove locations are to coincide with V-Groove locations in the Railing/Noise Wall.

7. FILL REQUIREMENTS: Shoulder or Roadway Pavement or Fill is required on top (1'-0" minimum depth) for the entire length of the spread footing on both sides of the Railing/Noise Wall. See Section B-B for details.

8. a. Index No. 5200 for Bars 5V and 5S1.

9. Place 6 ~ Bars 5B inside Stirrup Bars 5V as shown.

10. Spacing shown is along the Gutter Line.

11. Cross Reference: For Section B-B and Detail 8" see Sheet No. 2.

SECTION A-A

SECTION THRU SPREAD FOOTING AND BARRIER WALL INLET (Bars 5P, 5R and 5S1 in Traffic Railing/Noise Wall not shown for clarity)

TRAFFIC RAILING/NOISE WALL T-SHAPED SPREAD FOOTING

INDEX NO. 5213

1 of 2

DESCRIPTION:

2016 DESIGN STANDARDS

1/5/15

7/1/13

07/01/13

LAST REVISION
REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL

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<tr>
<td>U</td>
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<td>1'-0&quot;</td>
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**DOWEL**

1" Ø Smooth Bar

2'-0"

1" Ø DOWEL

**BAR 5U**

REINforcing STEEL NOTES:

1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints will have a 2" minimum cover.
3. Lap splices for Bars 5B will be a minimum of 2'-2".
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.

**PARTIAL END VIEW OF RAILING END**

TRANSITION FOR GUARDRAIL ATTACHMENT

(Showing Bars 5V, Bars 5S1 and Bars 5B inside of Stirrup Bars 5V)

**NOTE:** See Index No. 5210, Detail "A" for details.

**ESTIMATED T-SHAPED SPREAD FOOTING QUANTITIES**

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<td>Reinf. Steel (Typical)</td>
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<tr>
<td>Additional Rein. @ Expansion Joint</td>
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**Note:** The reinforcing steel quantity accounts for the difference between the shorter Stirrup Bars 5V for junction slabs or bridges and the longer Stirrup Bars 5V for spread footings.

**CROSS REFERENCE:**

For location of Section B-B, see Sheet 1.

**SECTION B-B**

**TYPICAL SECTION THRU SPREAD FOOTING**

(Bars 5P, 5R and 5S1 in Traffic Railing/Noise Wall not shown for clarity)

**NOTES:**

1. Match Cross Slope of Travel Lane or Shoulder.
2. Place 6 ~ Bars 5B inside Stirrup Bars 5V as shown.
3. See Index No. 5210 for Bars 5V and Bars 5S1.

**REINFORCING STEEL NOTES:**

1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints will have a 2" minimum cover.
3. Lap splices for Bars 5B will be a minimum of 2'-2".
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.

**REINFORCING STEEL BENDING DIAGRAMS**

**BILL OF REINFORCING STEEL**

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<tr>
<td>U</td>
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**DOWEL**

1" Ø Smooth Bar

2'-0"

1" Ø DOWEL

**BAR 5U**

REINforcing STEEL NOTES:

1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints will have a 2" minimum cover.
3. Lap splices for Bars 5B will be a minimum of 2'-2".
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.

**PARTIAL END VIEW OF RAILING END**

TRANSITION FOR GUARDRAIL ATTACHMENT

(Showing Bars 5V, Bars 5S1 and Bars 5B inside of Stirrup Bars 5V)

**NOTE:** See Index No. 5210, Detail "A" for details.

**ESTIMATED T-SHAPED SPREAD FOOTING QUANTITIES**

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<td>Additional Rein. @ Expansion Joint</td>
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**Note:** The reinforcing steel quantity accounts for the difference between the shorter Stirrup Bars 5V for junction slabs or bridges and the longer Stirrup Bars 5V for spread footings.

**CROSS REFERENCE:**

For location of Section B-B, see Sheet 1.
NOTES:

1. CONSTRUCTION REQUIREMENTS: Construct the Spread Footing level transversely and expansion joints plumb; do not construct the spread footing perpendicular to the roadway surface. Slip forming is not permitted.

2. CONCRETE: Use Class II concrete for slightly aggressive environments. Use Class IV concrete for moderately or extremely aggressive environments. Concrete will be in accordance with Specification Section 346.

3. DOWELS: Dowel Load Transfer Devices will be ASTM A 36 smooth round bar and hot-dip galvanized in accordance with Specification Section 962. Install Dowel Load Transfer Devices in accordance with Specification Section 350.

4. Construct ½" Expansion Joints plumb and perpendicular or radial to Gutter Line. Provide at 90'-0" maximum intervals as shown.

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

6. Construct ⅛" V-Grooves plumb and provide at 30'-0" maximum intervals as shown. Space V-Grooves equally between ½" Expansion Joints and/or Begin or End Spread Footing. V-Groove locations are to coincide with V-Groove locations in the Railing/Noise Wall.

7. FILL REQUIREMENTS: Shoulder or Roadway pavement and Fill is required on the traffic side of the spread footing for a distance of 4'-0" and the full length of the spread footing (3'-0" minimum depth) on the backside of the spread footing for Option A. Fill is required for a distance of 4'-0" on the backside of the spread footing and the full length of the spread footing (3'-0" minimum depth) on the traffic side of the spread footing for Option B. See Typical Sections on Sheet Nos. 2 and 3 for details.

8. Spacing shown is along the Gutter Line.

9. Work this Standard Drawing with one or both of the following:
   a. Index No. 5210 - Traffic Railing/Noise Wall (8'-0")
   b. Index No. 5211 - Traffic Railing/Noise Wall (14'-0")

CROSS REFERENCE:
   For Detail "A", see Sheet 3.
   For Section A-A and Estimated Quantities, see Sheet 4.
1. Match Cross Slope of Travel Lane or Shoulder.
2. Place 10 - Bars 5B inside Bars 5U1 as shown.
3. For Reinforcing Steel spacing, see Typical Section Thru
   Spread Footing - Option A this Sheet.
4. Provide 3" lip when optional construction joint is used.

NOTES: (Bars 5P, 5R and 5S1 in Traffic Railing/Noise Wall not shown for clarity)

TYPICAL SECTION THRU SPREAD FOOTING - OPTION A

TYPICAL SECTION THRU SPREAD FOOTING AND BARRIER WALL INLET - OPTION A
(Reinforcing Steel not shown for clarity (See Note 3))
REVISION
LAST OF DESIGN STANDARDS 2016

DESCRIPTION:

EXPANSION JOINT DETAIL
(Spread Footing expansion joints are required at 3/8" open joints in Traffic Railing/Noise Wall)

DETAIL "A"
(Option A Shown, Option B Similar)
(Showing Locations of 1/2" V-Grooves and 1/2" Preformed Expansion Joint Filler)

NOTE:
1. Match Cross Slope of Travel Lane or Shoulder.
2. Place 10 ~ Bars 5B inside Bars 5U1 as shown.
3. Provide 3" lip when optional construction joint is used.

TYPICAL SECTION THRU SPREAD FOOTING - OPTION B
(Bars 5P, 5R and 5S in Traffic Railing/Noise Wall not shown for clarity)

NOTES:
1. Match Cross Slope of Travel Lane or Shoulder.
2. Place 10 ~ Bars 5B inside Bars 5U1 as shown.
3. Provide 3" lip when optional construction joint is used.

TRAFFIC RAILING/NOISE WALL
L-SHAPED SPREAD FOOTING

INDEX NO. 5214
SHEET NO. 3 of 4
REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL

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</tr>
</tbody>
</table>

BAR 5S & 5C

BARS 5B & 5C

1" Ø DOWEL

10"

BAR 5U2

BAR 5U3

BAR 5S4 @ 6" sp.

BAR 5T @ 6" sp.

BAR 5V @ 6" sp.

Optional Const. Joint (See Note 3)

Bars 5U1 @ 6" sp. (lap with Bars 501 as shown)

Bars 5B (Typ.)

Optional 3" lip (See Note 3)

Bars 5SU3 (Rotate as required to clear footing reinforcing)

Bars 5SU1 @ 6" sp.

Bars 5SU2 (See Note 1)

Bars 5S4 @ 6" sp.

1" Preformed Expansion Joint Filler

NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints will have a 2" minimum cover.
3. Lap splices for Bars 5B will be a minimum of 2'-2".
4. Lap splices Bars 5T and 5V with 5U1 will be a minimum of 2'-2".
5. The Contractor may use Welded Wire Reinforcement (WWR) when approved by the Engineer. WWR must consist of Deformed wire meeting the requirements of Specification Section 931.

SECTION A-A
TYPICAL SECTION THRU SPREAD FOOTING AND BARRIER WALL INLETS - OPTION B
(Bars 5P, 5R and 5S1 in Traffic Railing/Noise Wall not shown for clarity)

NOTES:
1. Place 10 - Bars 5B inside Bars 5U1 as shown.
2. For Reinforcing Steel spacing, see Typical Section Thru Spread Footing - Option B on Sheet 3.
3. Provide 3" lip when optional construction joint is used.

ESTIMATED L-SHAPED SPREAD FOOTING QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (Foot)</td>
<td>CF/FT</td>
<td>0.414</td>
</tr>
<tr>
<td>Reinforcing Steel (Typical)</td>
<td>LB/FT</td>
<td>85.53</td>
</tr>
<tr>
<td>Additional Rein. @ Expansion Joint</td>
<td>LB</td>
<td>48.06</td>
</tr>
</tbody>
</table>

(Subtract 12.69 lb/ft from typical reinforcing steel quantity shown on Index No. 5210 to account for the absence of Stirrup Bars 5V and 5S1 in L-Shaped Spread Footings.)

CROSS REFERENCE:
For location of Section A-A, see Sheet 1.

TRAFFIC RAILING/NOISE WALL
L-SHAPED SPREAD FOOTING

REINFORCING STEEL NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints will have a 2" minimum cover.
3. Lap splices for Bars 5B will be a minimum of 2'-2".
4. Lap splices Bars 5T and 5V with 5U1 will be a minimum of 2'-2".
5. The Contractor may use Welded Wire Reinforcement (WWR) when approved by the Engineer. WWR must consist of Deformed wire meeting the requirements of Specification Section 931.
**NOTES**

1. **CONSTRUCTION REQUIREMENTS:** Construct the Trench Footing and expansion joint plumb; do not construct the Trench Footing perpendicular to the roadway. Slip forming is not permitted.
2. **CONCRETE:** Use Class II concrete for slightly aggressive environments. Use Class III concrete for moderately or extremely aggressive environments. Concrete will be in accordance with Specification Section 346.
3. **DOWELS:** 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 22ksi in accordance with ASTM C676.
4. Install Dowel load transfer devices in accordance with Specification Section 350.
5. Shear keys in footing are required when GFRP bars are used for dowel transfer devices and are optional with steel dowel bars. Torque Slope on Shear Key must be constant and between 3° to 45° from the transverse vertical plane.
6. Construct ≥ 2" Expansion joint plumb and perpendicular or radial to gutter line. Provide at 90'-0" maximum intervals as shown. Space V-Grooves equally between ≥ 2" Expansion joints and/or begin or end Trench footing. V-groove locations are to coincide with V-groove locations shown.
7. **FILL REQUIREMENTS:** Fill is required a distance of 4'-0" on both sides for the entire depth of the Trench footing. Fill is shown on Index No. 5210 to account for the absence of V-grooves shown.
8. **CONCRETE:** Use Class II concrete for slightly aggressive environments. Use Class III concrete for moderately or extremely aggressive environments.
9. **REINFORCING STEEL BENDING DIAGRAMS**
10. **ESTIMATED TRENCH FOOTING QUANTITIES**

---

**EXPANSION JOINT DETAIL:**

- Expansion Joint (See Detail this Sheet)
- Expansion Joint Fill (Trench footing expansion joints are required at ≥ 2" open joints in Trench Railing/Noise Wall)
GENERAL NOTES:
1. Construct Perimeter Walls in accordance with Specification Section 534.
2. Choice of either Precast Option or Masonry Option is at the discretion of the Contractor.
3. Post spacing is measured from centerline to centerline of foundation element. For this Index, posts and foundation elements have been designed for 20 ft. spacings. Use post spacings less than 20 feet only at changes in horizontal alignment, wall terminations or to accommodate steep grades.
4. See "Perimeter Wall Data Tables" in the plans for project requirements.
5. Field verify the locations of all overhead and underground utilities shown in the Wall Control Drawings.

PRECAST OPTION NOTES:
6. WALL NOTES:
A. Walls may consist of either a single height panel or two stacked panels. Minimum panel height is 4'-0".
B. Only when reduced overhead clearance between posts prohibits installation of panels from the top, side-installed panels are allowed. After panel is centered between posts, grout between panel ends and posts.

7. CONCRETE AND GROUT:
A. Cast-In-Place and Precast Concrete: Class IV (f’c = 5500 psi)
B. Grout for Auger Cast Piling: Minimum 28 Day Strength = 5500 psi
C. Minimum Compressive Strength for Form Removal and Handling of Posts and Precast Spread Footings:
   i. 2,000 psi for horizontally cast post, panels and precast spread footings.
   ii. 2,006 psi for vertically cast panels or when lift-up form tables are used for horizontally cast panels.

8. REINFORCING STEEL:
A. Concrete Cover: 1" unless otherwise noted.
B. In addition to the requirements of Specification Section 415, tie post and pile stirrups at the following locations as a minimum:
   i. Post Stirrups - Tie at all four corner bars and at every third interior bar intersection.
   ii. Pile Stirrups - Tie to the main vertical reinforcing at alternate intersections.

9. NEOPRENE PADS:
A. Neoprene Pads for Collar or Pedestal Bearing Points and between stacked panels may be either Plain Pads or Fiber Reinforced Pads, with a durometer hardness between Grade 50 and Grade 80 in accordance with Specification Section 932-2.

10. CASTING TOLERANCES:
A. Overall Height & Width: +/- 1/2".
B. Thickness: +/- 1/16".
C. Plane of side mold: +/- 1/8".
D. Openings: +/- 1/4".
E. Out of Square: 1/16" per ft., but not more than 1/4" total along any side.
F. Warping: 1/8" per 6 ft., but not more than 1/4" total along any side.
G. Bowing: 1/240 panel dimension.

11. PILING:
A. Construct Auger Cast Piling in accordance with the Plans and Specification Section 455.

MASONRY OPTION NOTES:
11. WALL NOTES:
A. Inspect construction in accordance with the International Building Code (IBC) Section 17.
B. Construct masonry walls with 8x8x16 block using a running bond pattern and concave tooled joints.
C. Make all elevation changes (steps) in footing and top of wall using full height blocks. Make top of wall steps at pilasters exclusively. Footing steps may be made between pilasters as necessary to maintain minimum soil cover.

12. WALL NOTES:
A. Inspect construction in accordance with the International Building Code (IBC) Section 17.
B. Construct masonry walls with 8x8x16 block using a running bond pattern and concave tooled joints.
C. Make all elevation changes (steps) in footing and top of wall using full height blocks.
D. Use reinforcing bar positioners to maintain vertical and horizontal bar placement. Lap joint reinforcing a minimum of 6".
E. Protect walls during construction from soil, grout or mortar stains. Clean wall as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

13. MATERIALS:
A. Precast Masonry Units (CMU): Provide normal weight blocks. If units become wet, do not install until they are dry.
B. Cast-In-Place Concrete: Class II (f’c = 3400 psi)
C. Mortar: Type S meeting requirements of ASTM C1329
D. Grout: Type S, coarse grout.
E. Aggregate for Grout: Meet the requirements of ASTM C490 or Specification Section 902 size 8 or 9.

14. STORAGE OF MATERIALS:
A. Store CMU’s on elevated platforms in a dry location or under cover. If stack removal is necessary, use a cleaning method indicated in NCMA TEK 8-2A applicable to the type of stain on the exposed surface.
B. During construction, cover tops of walls, with waterproof sheeting at the end of each day’s work, or when construction is not in progress. Extend sheeting a minimum of 2 feet down each side and secure in place.
C. Comply with Hot Weather Requirements in ACI 530.1.

GENERAL WALL ELEVATION
(Precast Option with Single Height Panel Shown, Others Similar)
**TYPE "C" CAP DETAILS**

*Corner Cap

**SECTION B-B**

**PICTORIAL VIEW**

**TYPE "B" CAP DETAILS**

*Corner Cap

**SECTION B-B**

**PICTORIAL VIEW**

**TYPE "A" CAP DETAILS**

*Precast Option only

**SECTION B-B**

**PICTORIAL VIEW**

**CAP PLACEMENT DETAIL**

(Type "B" Post Cap with Precast Option Shown)
DRAINAGE DETAILS

DRAINAGE HOLES TYPES A, B, C & D

* Hole Types A, B, C, & D refer to distance from bottom of panel/wall to center of the pipe.

NOTES:
1. Drainage holes may be formed with 4" NPS PVC pipe that may remain in place.
2. See Wall Control drawings for number, Type and location/spacing of drainage holes.
ELEVATION STEP AT TOP OF WALL
(Precast Panel Cap not Shown)

ELEVATION STEP AT BOTTOM OF WALL
(Back Face Chamfer Shown Front Face Chamfer Similar)

PIVOTING JOINT DETAILS
NOTE: Shop Drawings shall include specific pivoting joint details of panel ends at locations where the deflection angle (2°) between panels exceeds 20°.

TYPICAL ELEVATION
(Front Face Shown, Textured Finish not Shown for Clarity)

SECTION D-D
SECTION E-E

TYPICAL PLAN
Nominal embedment (not including tolerances)
* Vertical Steel – #4 Bars @ 10" (As=0.24 in.^2/ft.^2) (Typ.)

NOTE: At the Contractor's Option, Smooth or Deformed Welded Wire Reinforcement may be used (equal area).

Horizontal Steel – #4 Bars @ 7/16 (As=0.32 in.^2/ft.^2) (Typ.)

NOTE: At the Contractor's Option, Smooth or Deformed Welded Wire Reinforcement may be used (equal area).

TYPICAL PANEL ELEVATION

At the Contractor's Option, Smooth or Deformed Welded Wire Reinforcement may be used (equal area).

Panel Height (H)

Panel Length (L) (0.207 L) 0.586 L 0.207 L

Pick up points

STANDARD PICK UP POINTS FOR PANELS
(Panels shall be rotated about long axis only)

DETAIL "B" - TOP-INSTALLED
(Typ. Both Ends)

SECTION G-G

PERIMETER WALLS
TYPICAL POST SECTION
(H Section)

SECTION I-I
(PreCast Collar)

SECTION J-J

LOW CLEARANCE OPTION

TYPICAL POST SECTION
(H Section - Above Collar)

SECTION H-H
(H Section - Above Collar)

NOTES:
1. See Shop Drawing for Post Lengths.

Bar Length = 5'-0"

PERIMETER WALLS

2016 DESIGN STANDARDS

PRECAST OPTION - STANDARD POST DETAILS

<table>
<thead>
<tr>
<th>Wind Speed (MPH)</th>
<th>Pile Length</th>
<th>Bars A</th>
<th>Bars P1 thru P6</th>
<th>Bars S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>11'-6&quot;</td>
<td>#3</td>
<td>#4</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>13'-6&quot;</td>
<td>#6</td>
<td>#3</td>
<td>#4</td>
</tr>
<tr>
<td>150</td>
<td>15'-0&quot;</td>
<td>#7</td>
<td>#3</td>
<td>#4</td>
</tr>
</tbody>
</table>

TABLE 1

Bar Length = 2'-3½"

BAR BENDING DETAILS

BAR P1
Bar Length = 2'-3½"

All bar dimensions in bending diagrams are out-to-out.

BAR P2
Bar Length = 0'-0"

All bars not shown in the bending diagrams are straight.
**NOTES:**
1. For Reinforcing Steel Sizes, and Foundation Dimensions, see Table 1 Sheet 6.
2. For location of Section H-H and I-I, see Sheet 6.
3. The Bearing area beneath Neoprene Pads is formed by top of Auger Cast Pile Grout.

**BAR BENDING DETAILS**

**SPECIAL POSTS FOR 90° CORNERS**

**SPECIAL POSTS FOR 45° CORNERS**

**PRECAST OPTION - SPECIAL CORNER POSTS**
Table 2

<table>
<thead>
<tr>
<th>Wind Speed Category</th>
<th>Masonry Walls (8x8x16)</th>
<th>Foundations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bars V1</td>
<td>#5</td>
</tr>
<tr>
<td>150</td>
<td>#5</td>
<td>2'-0&quot;</td>
</tr>
<tr>
<td>130</td>
<td>#5</td>
<td>1'-8&quot;</td>
</tr>
</tbody>
</table>

Notes:
1. End vertical reinforcing bars 1½" from top of bond beam blocks and horizontal bars 1½" from edge of control joints.
2. Do not continue horizontal #4 bond beam reinforcing through control joint.
3. Use stainless steel joint stabilizing anchors spaced at 16" vertically at all control joints, install per manufacturer's instructions.
4. Seal Control Joints with backer rod and Type "A" silicone sealant (top and both sides).
5. See Sheet 10 for Bar placement details.
6. For Pilaster Cap Details, see Sheet 2.

TYPICAL ELEVATION
(T-Footing Shown, Trench Footing Similar)

SECTION M-M
PILASTER REINFORCING AND WALL CONTROL JOINT DETAIL

SECTION K-K
(Shown at Cell Without Vertical Reinforcing)