1. Provide Plain or Fiber Reinforced Bearing Pads meeting the requirements of Specification Section 932 for Ancillary Structures.
   A. For Collar Bearing Points provide:
      1. 4"x 4"x ½" Fiber Reinforced Pads;
      2. Plain Pads 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 Bearing Pads.

2. Construct Noise Walls in accordance with the requirements of Specification Section 534, 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
      2. Cast-In-Place Collars: Class IV
   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 panel or when tilt-up tables are used for horizontally cast panels.
   C. 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: +/- ½"
   B. Thickness: +/- ⅛"
   C. Plane of side mold: +/- 1/16"
   D. Openings: +/- ⅛"
   E. Out of Square: ⅛" per 6 ft., but not more than ⅛"Vertical 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"
**Type "A"**
SMOOTH

**Type "B"**
ASHLAR STONE

**Type "C"**
SPLIT FACE RUNNING BOND BLOCK

**Type "D"**
FRACUTED GRANITE

**Type "E"**
WIRE-CUT BRICK

**Type "F"**
CUT CORAL BLOCK (RUNNING BOND)

**Type "G"**
VERTICAL FRACUTED FIN

**Type "H"**
TRAPEZOID VERTICAL FINS W/ FRACUTED FACE (COLORADO DRAG AGGREGATE)

**Texture Options**

**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.
DESCRIPTION:

LAST REVISED
07/01/14

REVISED

NOISE WALLS - (PRECAST)

GRAPHICS & TEXTURE DETAILS

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.
**REVISION DESCRIPTION:**

**LAST REVIEW:**

**STANDARD PLANS**

**FY 2019-20**

**NOISE WALLS - (PRECAST)**

**REV 534-200 4 of 16**

**INDEX**

**SHEET**

**TYPICAL ELEVATION**

- **Typical Elevation:**
  - Post & Pile
  - Top Panel
  - Bottom Panel
  - Finished Grade

**SECTION A-A**

- **Typical Elevation:**
  - 1" Ø Polyethylene Rod (continuous)
  - 2 - 1 ½" x 6" x ½" Bearing Pad (shown)
  - V-Groove & 1" Ø Polyethylene Rod

**SECTION B-B**

- **TYPICAL DETAILS:**
  - 1" Polyethylene Rod
  - V-Groove & S/4 B/S 4'
  - Neoprene Pads

**ELEVATION STEP AT TOP OF WALL**

- **Step:**
  - Top of Pile
  - R/W Line
  - Top Panel

**ELEVATION STEP AT BOTTOM OF WALL**

- **Step:**
  - Bottom Panel
  - R/W Line
  - Top Panel

**Note:**

See the plans for required post spacings (S).

**TYPICAL DETAILS**

- **Post & Pile:**
  - Top Panel
  - Bottom Panel

**WITH POST CAP**

- **Post & Pile:**
  - Top Panel
  - Bottom Panel
  - R/W Line

**WITHOUT POST CAP**

- **Post & Pile:**
  - Top Panel
  - Bottom Panel
  - R/W Line

**Plan View:**

- **Typical Plan View:**
  - Post & Pile
  - Top Panel
  - Bottom Panel
NOTE:
At the Contractor's option, Smooth or Deformed Welded Wire Reinforcement may be used (equal area).

Vertical Steel ~ #4 Bars @ 10" (As=0.24 in²/ft.) (Typ.)

Horizontal Steel ~ #4 Bars @ 8" (As=0.30 in²/ft.) (Typ.)

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 in²/ft.).

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

SECTION D-D
(Showing Flush Type Panel)

SECTION D-D
(Showing Recessed Type Panel)

DETAIL "A" - TOP-INSTALLED
(Typical both ends)

DETAIL "A" - SIDE-INSTALLED
(Typical both ends)

DETAIL "B" - TOP-INSTALLED
(Typical both ends)

DETAIL "B" - SIDE-INSTALLED
(Typical both ends)

TYPICAL PANEL DETAILS

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°.

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

DETAIL "C"
(Back Face Chamfer Shown Front Face Chamfer Similar)

TYPICAL PANEL DETAILS

PIVOTING DETAILS
(Flush Type Panel)

PIVOTING DETAILS
(Recessed Type Panel)
DRAINAGE HOLES TYPES A, B, C & D
(Front Face of Wall Shown)
(Two Holes Shown, One Hole Similar)

* 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 HOLES TYPES A, B, C & D
(Front Face of Wall Shown)
(Two Holes Shown, One Hole Similar)

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 grate after fabrication in accordance with Specification Section 962.
2. Expansion Anchors: Use 2½" Ø x 2" min. corrosion resistant (zinc/aluminum alloy or stainless steel) expansion anchors to connect grate to panels.
3. Blockout textured concrete surface for a strip 2" wide around drainage hole to enable secure attachment of the drainage grate.
**REV ISIO N DESCRIPTION:**

**REVISION LAST STANDARD PLANS**

**TEXTURE (Formed)**

- Front Face Post
- Roadway Face of Wall
  - " Post
  - Wall

- Post
  - 1'-6"

- Post
  - 1'-6"

- Post
  - 1'-6"

**NOTES:**
1. For Post Reinforcing see Sheets 15 and 16.
2. For Pile Length Tables see Sheets 15 and 16.
Top of Wall

Precast Post

Top of Precast Collar, Elev. A

Finished Grade

Exposed Precast Post Reinforcement (Typ.)

Exposed Post & Pile

Precast Post

Precast Collar, Elev. A

Post & Pile

Bottom of Augered Collar, Elev. A

Precast Post

Post & Pile

Auger Cast Pile

30\(^\circ\) Auger Cast Pile

36\(^\circ\) Auger Cast Pile

10 - #9 Bars (Typ.), See Section P-P

10 - #9 Bars (Typ.)

Post, Pile & Wall

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

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

**TYPICAL POST**

STANDARD POST PLACEMENT IN AUGER CAST PILE

(H-Post Shown, 45° Corner Posts Similar)

**LOW CLEARANCE OPTION**

NOTE:
1. 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".

For Pile Length Tables, see Sheets 15 and 16.

H-Post Shown, 45° Corner Posts Similar

Projected Location of Bearing Pad (Typ.)
(See Sheet 1, Note H)
45° POST NOTES:
1. Reference Sheets 8 & 9 for location of Sections. 
   Space Bars P7 as shown for Bars P1.
   Space Bars P8 as shown for Bars P2.
2. Match texture thickness with appropriate Panel face.
3. For Post Reinforcing, see sheets 15 & 16.
4. For Pile Length Tables, see sheets 15 & 16.

45° POST DETAILS:
- Bars P7 (Pairs) (See Note 1)
- 36" Ø Auger Cast Pile
- 2" Cover (Typ.)
- Bars A (Typ.)
- Bars B (Typ.)
- Bars D
- Bars E
- Bars P8 (See Note 1)
- Bars P8 (Typ.)
- Bars B (Typ.)
- Bars A (Typ.)
- Chamfer (Typ.)
- Radius (Typ.)
- Texture (when required)

45° POST PLACEMENT IN AUGER CAST PILE

SECTION H-H
(45° Corner Post)

SECTION K-K
(Collar Section, 45° Corner Post)

SECTION L-L
(45° Corner Post)

SECTION N-N
(45° Corner Post)

SECTION P-P
(45° Corner Post)
REVISION

DESCRIPTION:

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 NOTES:

* 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".

TYPICAL POST

LOW CLEARANCE OPTION

90° CORNER POST DETAILS

(Post Surface Features Not Shown For Clarity)
NOTES:
1. For Pile Length Tables, see Sheets 15 and 16.
2. Trowel finish top of collar 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".
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".

36" Ø Auger Cast Pile

SECTION V-V

SECTION W-W

10 - #9 Bars (Typ.), See Section W-W

Exposed Precast Post Reinforcement (Typ.)

36" Ø Auger Cast Pile

Top of Auger Cast Pile, Elev. A (See Note 2)

90° Corner Low Clearance Post

* Top of Wall

Bottom of Augered Hole per Plan

ELEVATION

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".

36" Ø Auger Cast Pile

SECTION V-V

SECTION W-W

10 - #9 Bars spaced equally around Bar P3 (Typ.)

* Top of Wall

90° Corner Low Clearance Post

Finished Grade

Exposed Precast Post Reinforcement (Typ.)

36" Ø Auger Cast Pile

Top of Auger Cast Pile, Elev. A (See Note 2)

90° Corner Low Clearance Post

ELEVATION

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".

36" Ø Auger Cast Pile

SECTION V-V

SECTION W-W

10 - #9 Bars spaced equally around Bar P3 (Typ.)

* Top of Wall

90° Corner Low Clearance Post

Finished Grade

Exposed Precast Post Reinforcement (Typ.)

36" Ø Auger Cast Pile

Top of Auger Cast Pile, Elev. A (See Note 2)
**TABLE 1A - TABLE OF POST REINFORCING STEEL**

<table>
<thead>
<tr>
<th>NOMINAL 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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<td>SIZE</td>
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**TABLE 1B - PILE LENGTHS (Feet) - WIND SPEED = 130 MPH**

<table>
<thead>
<tr>
<th>NOMINAL WALL HEIGHT (Feet)</th>
<th>H-POSTS 10'-0&quot; POST SPACING</th>
<th>CORNER POSTS 10'-0&quot; POST SPACING</th>
<th>H-PGTS 20'-0&quot; POST SPACING</th>
<th>CORNER POSTS 20'-0&quot; POST SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SOIL 1</td>
<td>SOIL 2</td>
<td>SOIL 1</td>
<td>SOIL 2</td>
</tr>
<tr>
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<td>30'</td>
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<td>36'</td>
<td>36'</td>
<td>36'</td>
<td>36'</td>
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</tbody>
</table>

**TABLE NOTE:**

1. Bars D and Bars E 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.

**PIECE DEPTH & REINFORCING SUMMARY**

- Wall Height
- Pile, Post & Wall
- Soil 2 = Medium Dense Granular Soil, N = 10 to 40.
- Soil 1 = Loose Granular Soil, N = 4 to 9.

**LAST REVISED:** 11/01/16

**DESCRIPTION:** FY 2019-20 STANDARD PLANS

**INDEX:** 534-200

**SHEET:** 15 of 16
### TABLE 2A - TABLE OF POST REINFORCING STEEL (WIND SPEED = 150 MPH)

<table>
<thead>
<tr>
<th>NOMINAL WALL HEIGHT (Feet)</th>
<th>POST LENGTHS</th>
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<th>WITH CAP</th>
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</thead>
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<tr>
<td></td>
<td>10'-0&quot; POST SPACING</td>
<td>BARS A</td>
<td>BARS B</td>
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<td></td>
<td>SIZE</td>
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<td>SIZE</td>
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### TABLE 2B - PILE LENGTHS (Feet) - WIND SPEED = 150 MPH

<table>
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<th>NOMINAL WALL HEIGHT (Feet)</th>
<th>POST LENGTHS</th>
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<td>10'-0&quot; POST SPACING</td>
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<td>BARS B</td>
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### TABLE 3A - TABLE OF POST REINFORCING STEEL (WIND SPEED = 170 MPH)

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<thead>
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<th>WITH CAP</th>
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</thead>
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### TABLE 3B - PILE LENGTHS (Feet) - WIND SPEED = 170 MPH

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