NOTES

A. DESIGN SPECIFICATIONS:

B. DESIGN CRITERIA:
The Precast Sound Barriers are pre-designed and based on the criteria in the Structures Manual, Volume 1.

C. CONCRETE AND GROUT:
1. Concrete Class and Compressive Strength:
   a. Cast-in-Place Collars: Class IV (f’c = 5500 psi)
   b. Precast Panels, Collars and Post Caps: Class IV (f’c = 5500 psi)
   c. Posts: Class IV (f’c = 5500 psi)

2. Grout for Auger Cast Piling:
   a. Maximum Working Compressive Strength = 2200 psi
   b. Minimum 28 Day Strength = 5500 psi
   c. Minimum Compressive Strength for Form Removal and Handling of Posts and Panels:
      a. 2,500 psi for horizontally cast post and panel.
      b. 2,000 psi for vertically cast panels or when tilt-up form tables are used for horizontally cast panels.

D. REINFORCING STEEL:
1. Reinforcing steel shall conform to ASTM A 615, Grade 60.
2. Welded wire reinforcement shall conform to ASTM A 185 (smooth wire) or ASTM A497 (deformed wire).
3. Concrete Cover of 2" shall be provided, unless otherwise noted.
4. In addition to the requirements of Specification Section 415, tie post and pile stirrups at the following locations as a minimum:
   a. Post Stirrups - Tie at all four corner bars and at every third interior bar intersection.
   b. Pile Stirrups - Tie to the main vertical reinforcing at alternate intersections for circular configurations and for rectangular configurations at the four corners and at every third interior bar intersection.

E. SURFACE FINISHES:
Provide a Class 5 Finish in accordance with Specification Section 400, unless otherwise shown on the Wall Control Drawings. See Sheet No. 2 for texture finish options.

F. PILING:
Construct Auger Cast Filing in accordance with the Plans and Specification Section 455.

G. UTILITIES:
Field verify the locations of all overhead and underground utilities shown in the Wall Control Drawings.

H. NEOPRENE PADS AND RESILIENT PADS:
1. Neoprene Pads for Panel Bearing Points Between the Stacked Panels:
   The Neoprene pads for the panel bearing points shall be Plain Pads, Grade 50 durometer hardness in accordance with Specifications Sections 932-2.1.

2. Neoprene Pads for Collar Bearing Points:
   The Neoprene pads for Fiber Reinforced Pads, with a durometer hardness between Grade 50 and Grade 80, in accordance with Specification Section 932-2.1. Plain Pads may be substituted for Fiber Reinforced Pads when sufficient bearing area is available on the concrete collar, as follows:
   a. 10' post spacing: 4" x 4" x ½" Plain Pads, Grade 50 durometer hardness.
   b. 20' post spacing and <18' wall height: 4" x 4" x ½" Plain Pads, Grade 50 durometer hardness.
   c. 20' post spacing and ≥18' wall height: 4" x 4" x ½" Plain Pads, Grade 50 durometer hardness.

3. Horizontal panel joints shall be located outside of the graphic relief (if applicable). Horizontal panel joints shall be held at a constant elevation for a given wall, where possible.
4. Posts shall be "M" type cross-section with panels installed from above.
5. All posts shall be field plummed in auger cast piles with an installation template. The template shall be adjustable for horizontal placement, vertical placement and plumbliness of posts. The template shall be such that the installation tolerances can be held. Template shall remain in place for a minimum of 24 hours after post installation.
6. The Contractor shall be responsible for meeting OSHA requirements. Any utility adjustments, charges for power stoppages, all realignments, special erection methods, etc. to meet these requirements shall be included in bid.
7. Shimming of wall panels above the piler collar, beneath the bearing pads is permitted up to a maximum of 1½" height. Shims must be either stainless steel (Type 304 or 316) or engineered polymer (copolymer or multipolymer) plastic. Plastic shims must have a minimum compressive strength of 8,000 psi with any fractures. Stacking of shims is permitted as follows:
   a. For shimming height of 1" or less, provide up to 4 to ½" shims.
   b. For shimming heights greater than 1", use a minimum 3½" thick single shim and up to 3½" shims.
Stacked shim plates must be bonded together with a compatible epoxy adhesive.

I. SOUND BARRIER WALL NOTES:
1. Distance between piles shall be a maximum of 20 ft. from centerline to centerline. These Sound Barrier Wall Standard Indexes allow for either 15 or 20 ft. post spacing. The panel system depicted is based on a 20 ft.
2. Walls greater than 12 ft. in height shall consist of 2 or 3 stacked panels (upper and lower), each less than 12 ft. in height. The height of the upper panel shall be a minimum of 8 ft. or greater as necessary to any graphic relief (if applicable). The lower panel(s) shall be not less than 4 ft. in height. Walls equal to or less than 12 ft. in height shall consist of either a single panel or 2 stacked panels with an 8 ft. upper panel provided that any graphic relief (if applicable) will fit within the upper panel.
3. Horizontal panel joints shall be located outside of the graphic relief (if applicable), Horzontal panel joints shall be held at a constant elevation for a given wall, where possible.
4. Posts shall be "M" type cross-section with panels installed from above.
5. All posts shall be held plumb in auger cast piles with an installation template. The template shall be adjustable for horizontal placement, vertical placement and plumbliness of posts. The template shall be such that the installation tolerances can be held. Template shall remain in place for a minimum of 24 hours after post installation.
6. The Contractor shall be responsible for meeting OSHA requirements. Any utility adjustments, charges for power stoppages, all realignments, special erection methods, etc. to meet these requirements shall be included in bid.
7. Shimming of wall panels above the piler collar, beneath the bearing pads is permitted up to a maximum of 1½" height. Shims must be either stainless steel (Type 304 or 316) or engineered polymer (copolymer or multipolymer) plastic. Plastic shims must have a minimum compressive strength of 8,000 psi with any fractures. Stacking of shims is permitted as follows:
   a. For shimming height of 1" or less, provide up to 4 to ½" shims.
   b. For shimming heights greater than 1", use a minimum 3½" thick single shim and up to 3½" shims.
Stacked shim plates must be bonded together with a compatible epoxy adhesive.

J. CASTING TOLERANCES:
1. Overall Height & Width: +/- ¼"
2. Thickness: +/- ½"
3. Plane of Side: +/- 1/64"
4. Openings: +/- 1/32"
5. Out of Square: 1/32" per 6 ft., but not more than 1/8" total along any side
6. Warping: 1/32" per foot distance to nearest corner
7. Bowing: 1/240 panel dimension
8. Surface Smoothness for Type 'A' (Smooth) Surface Texture Option: +/- 1/64" along a 10 ft. straightedge.

K. CSP OR CONTRACTOR REDESIGN:
1. The Contractor will submit a CSP (Cost Savings Initiative Proposal) or Contractor Redesigns to be allowed to modify the original designs, or post spacing.
2. Substitution of proprietary systems or panels not listed in the Wall Control Drawings will not be allowed.

L. QUALIFIED PRODUCTS LIST:
Manufacturers seeking approval of proprietary sound barrier panels, posts and foundations or systems for inclusion on the Qualified Products List as pre-approved suppliers must submit a QPL Product Evaluation Application along with design documentation, vendor drawings and other information as required in the Sound Barrier OPL Acceptance Criteria. Specific project Shop Drawings are required for sound barrier projects in accordance with Specification Section 534.

M. ALTERNATE:
The Contractor shall construct the standard precast 20'-0" panel option depicted in the plans or shall construct one of the proprietary sound barrier panel or proprietary system options (panel and foundation) listed in the Wall Control Drawings.

O. FINISH COATING:
All wall areas not shown to receive an anti-graffiti coating shall be coated in accordance with Specification Section 400 of the Specifications with a Class 5 Applied Finish Coating. The color of the system shall be the same as the anti-graffiti system as designed by the Engineer.

P. TEST WALL:
The Contractor shall construct a test wall at the beginning of the project consistent with Specification Section 534. The Contractor shall demonstrate that all casting and erection tolerances can be met in order to assure that the precast elements fit together as intended.
1. Surfaces shall be formed, rolled, or pressed using form liners in accordance with the Plans and Specifications (Class 3 Surface Finish).

2. See Wall Control Drawings for project aesthetic requirements.
Second layer surface for graphic design (optional)

Single layer flat surface attached to form liner for casting smooth areas of wall design. See graphic drawings. Joints between flat surface and form liner to be sealed watertight.

NOTES:

1. Contractor shall submit specific form liner samples for approval by the Engineer.

2. Textures and graphics shown are for demonstration purposes only. See Wall Control Drawings for project specific texture and graphic requirements.
TYPICAL ELEVATION

Collar (Typ.)
Auger Cast Pile (Typ.)

Pile (Typ.)
Auger Cast Pile (Typ.)

1'-6" Max.
6" Min.
1'-6" Max.

Bottom of wall elevation
Top of wall elevation

Precast Post Cap (when required)

Top Panel
Bottom Panel
Finished Grade

SECTION A-A

1" Ø Polyethylene rod (continuous)

2 - 1 1/2" x 6" x 6" Neoprene Pads (shown) or 1 - 4" x 6" x 6" Neoprene Pad

SECTION B-B

1" Ø Polyethylene rod (continuous)

2 - 1 1/2" x 6" x 6" Neoprene Pads (shown) or 1 - 4" x 6" x 6" Neoprene Pad

Neoprene Pad

V-Groove & 1" Ø Polyethylene Rod

B1 B

1' Post & Pile

1' Post & Pile

REVISIONS

DATE
BY
DESCRIPTION
01/01/11
CMH
copied from 5202-1of6.

NEW SHEET: TYPICAL ELEVATION, SECTION A-A & SECTION B-B

2010 Interim Design Standard

PRECAST SOUND BARRIERS

INDEX No.
5200

Page dimensions: 1224.0x792.0
**TYPICAL PANEL ELEVATION**

*In lieu of utilizing the 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, the vertical steel may be reduced to #4 Bars @ 1'-3" (As=0.15 in.²/ft.) (Typ.).

**NOTE:** At the Contractor's option, smooth or deformed welded wire reinforcement may be used (equal area).

**Deformed Welded Wire Reinforcement**

**NOTE:** In lieu of utilizing the pick up points below, panels may be cast vertically or cast horizontally.

**REQUIRED PICK UP POINTS FOR PANELS**

(Panels shall be rotated about long axis only)

**ELEVATION STEP AT BOTTOM OF WALL**

**PRECAST POST CAP DETAIL**

**NOTE:** See plans for Post Cap requirements. See sheet 13 for Post Cap details.

**ELEVATION STEP AT TOP OF WALL**

**TYPICAL PANEL DETAILS**
Non-roadway face of wall Back Face Panel Texture (*)

RIAL Text may be Formed, Rolled or Pressed into Plastic Concrete.

1 1/2" Max. (Typ.)

Roadway face of wall Front Face Post Texture (Formed) 20'-0", Max.

Roadway face of wall Front Face Panel Texture (Formed)

90°- 90° (Exterior Angle)

CASE 1 (Interior Angle)

SECTION D-D

SECTION F-F

DETAIL B

REVISIONS

DATE

By

DESCRIPTION

01/01/11

CMH

DETAIL B copied from 5202-2of6.

DETAILS copied from 5202-3of6. SECTION D-D, SECTION F-F & New Sheet. PLAN copied from 5202-1of6. PIVOTING POINT

PRECAST SOUND BARRIERS

FLUSH PANEL END DETAILS

2010 Interim Design Standard

Index No.
**PIVOTING POINT DETAILS**

*Texture may be Formed, Rolled or Pressed into Plastic Concrete.*

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

**CASE 1** (Interior Angle)

**CASE 2** (Exterior Angle)

**DETAIL I**

**SECTION D-D**

**SECTION F-F**

**RECESSED PANEL END DETAILS**

**PRECAST SOUND BARRIERS**
FIRE HOSE ACCESS HOLE TYPICAL DETAIL
(Front Face of Wall Shown)
(Flush Panel Option Shown
Recessed Panel Option Similar)

NOTE: Fire Hose Access Point to be located at or near fire hydrants

DRAINAGE HOLES TYPES A, B, C & D
(Front Face of Wall Shown)
(Flush Panel Option Shown
Recessed Panel Option Similar)

NOTE: Hole Types A, B, C and D refer to distance from bottom of panel to center of opening. See Wall Control Drawings.

PLUG DETAIL

NOTES:
Grating shall be ASTM A 36 steel and shall be hot dip galvanized after assembly in accordance with ASTM Specification A 123.
Expansion anchors shall be in accordance with ASTM A 307 (Galvanized).
Welding shall be in accordance with the current edition of the ANSI/AWS D1.1 Welding Code.
NOTES:
1. For Table of Reinforcing Steel Sizes and Post & Pile Lengths, see Sheet Nos. 14 & 15.
2. For Dim 'A', see Sheet Nos. 14 & 15.
3. For Precast Collar Option, see Sheet No. 10.

* Top of Wall

Precast Post

(See Note 3)

* Post, Pile & Collar

1. For Table of Reinforcing Steel Sizes and Post & Pile Lengths, see Sheet Nos. 14 & 15.

* Top of Wall

Bottom of Augered Hole per Plan

POST IN AUGERED HOLE

GROUND MOUNTED POST REINFORCEMENT

(Prior to placement in augered hole)

TYPICAL POST SECTION

(H Section)

PILE & POST REINFORCING STEEL (CAST-IN-PLACE COLLAR OPTION)

NOTES:
1. For Table of Reinforcing Steel Sizes and Post & Pile Lengths, see Sheet Nos. 14 & 15.
2. For Dim 'A', see Sheet Nos. 14 & 15.
3. For Precast Collar Option, see Sheet No. 10.

PRECAST SOUND BARRIERS

5200
1. Use 3'-6" CIP Collar for all 90° corner posts, Bars P10 not required for 90° corner pile collar.
2. For Post & Pile Lengths, see Sheet Nos. 14 & 15.
3. For Table of Reinforcing Steel, see Sheet Nos. 14 & 15.
4. Reduce standard panel length or adjust post spacing by 3' at each 90° Corner Post to accommodate the Special Post dimensions.

NOTES:

SPECIAL 90° CORNER POST

VIEW D-D
PARTIAL ELEVATION OF POST
(Vertical Reinforcing not shown for clarity)
VIEW C-C (PARTIAL ELEVATION)

(PRECAST COLLAR)

(Only Front Face shown for Clarity)

PARTIAL ELEVATION

3'-6" Ø CAST-IN-PLACE COLLAR

(Only Front Face shown for Clarity)

NOTE:

For Table of Reinforcing Steel Sizes and Post & Pile Lengths, see Sheet Nos. 14 & 15.
**PRECAST POST CAPITAL**

**SECTION C-C**

**TYPE "A" CAP DETAILS**

**PICTORIAL VIEW**

**SECTION C-C**

**TYPE "B" CAP DETAILS**

**PICTORIAL VIEW**

**SECTION C-C**

**TYPE "C" CAP DETAILS**

**PICTORIAL VIEW**

---

**PRECAST SOUND BARRIERS**

2010 Interim Design Standard

New Sheet from Index No. from 5200

Index No. 5200

01/01/11

13 of 15
## POST & PILE

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

### VIEW A A

### TABLE 1 - FOUNDATIONS FOR MEDIUM DENSE GRANULAR SOILS (Soil SPT N60 Values between 10 and 40)

<table>
<thead>
<tr>
<th>WALL TYPE</th>
<th>POST LENGTH WITH CAP</th>
<th>PILE LENGTH</th>
<th>10' 0&quot; POST SPACING</th>
<th>20' 0&quot; POST SPACING</th>
<th>PILE/POST REINFORCING</th>
<th>CAST-IN-PLACE COLLAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12'-0&quot;</td>
<td>12'-0&quot;</td>
<td>12'-0&quot;</td>
<td>12'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>B</td>
<td>13'-0&quot;</td>
<td>13'-0&quot;</td>
<td>13'-0&quot;</td>
<td>13'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>C</td>
<td>14'-0&quot;</td>
<td>14'-0&quot;</td>
<td>14'-0&quot;</td>
<td>14'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>D</td>
<td>15'-0&quot;</td>
<td>15'-0&quot;</td>
<td>15'-0&quot;</td>
<td>15'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>E</td>
<td>16'-0&quot;</td>
<td>16'-0&quot;</td>
<td>16'-0&quot;</td>
<td>16'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>F</td>
<td>17'-0&quot;</td>
<td>17'-0&quot;</td>
<td>17'-0&quot;</td>
<td>17'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>G</td>
<td>18'-0&quot;</td>
<td>18'-0&quot;</td>
<td>18'-0&quot;</td>
<td>18'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>H</td>
<td>19'-0&quot;</td>
<td>19'-0&quot;</td>
<td>19'-0&quot;</td>
<td>19'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>I</td>
<td>20'-0&quot;</td>
<td>20'-0&quot;</td>
<td>20'-0&quot;</td>
<td>20'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>J</td>
<td>21'-0&quot;</td>
<td>21'-0&quot;</td>
<td>21'-0&quot;</td>
<td>21'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
<tr>
<td>K</td>
<td>22'-0&quot;</td>
<td>22'-0&quot;</td>
<td>22'-0&quot;</td>
<td>22'-0&quot;</td>
<td>#5</td>
<td>#5</td>
</tr>
</tbody>
</table>

### NOTES:
- Bars P5 & P6 are only used in 90° Corner Posts.
- Bars P7, P8, & P9 are only used in 45° Corner Posts.
- Bars P9 & P10 are used in the Cast-In-Place Collar Option.

For Bar Designations, see Sheet No. 1 - 12.
### TABLE 2 - FOUNDATIONS FOR LOOSE GRANULAR SOILS (SPT N<sub>60</sub> Values between 4 and 9)

<table>
<thead>
<tr>
<th>WALL TYPE</th>
<th>POST LENGTH WITH CAP</th>
<th>POST LENGTH WITHOUT CAP</th>
<th>PILE LENGTH</th>
<th>PILE/POST REINFORCING</th>
<th>CAST IN PLACE COLLAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10'-0&quot; POST SPACING</td>
<td>20'-0&quot; POST SPACING</td>
<td>30'-0&quot; POST SPACING</td>
<td>20'-0&quot; POST SPACING</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10&quot; A</td>
<td>10&quot; B</td>
<td>20&quot; A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10&quot; C</td>
<td>10&quot; D</td>
<td>20&quot; P9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10&quot; E</td>
<td>10&quot; F</td>
<td>20&quot; P10</td>
</tr>
</tbody>
</table>

**PILE DEPTH & REINFORCING SUMMARY**

* Do not use for walls with 30" dia. foundations, 20' spacing, & greater than 21' high.

---

**REVISIONS**

- **DATE:** 01/01/11
- **DESCRIPTION:** New Sheet from Index No. 5206 (Sheet 2 of 2). Deleted Options A, B, C, & D.

---

**PRECAST SOUND BARRIERS**