**GALVANIZED OPEN ENDED CAST-IN-PLACE (OECIP) CONCRETE PILE**

**Without Pile Point Reinforcement**

**Notes:**

- Welded or seamless steel shell (pipe) shall be ASTM A520 Grade 3 (fy = 45,000 psi).
- Open ended pile shall be augered out to the minimum pile cleanout penetration elevation and filled with Class B-1 concrete.
- Concrete for cast-in-place pile shall be Class 5-1.
- Steel casting for cut-in-place pile shall be ASTM A27 Grade 65-35 ASTM A148 Grade 90-60.
- The minimum wall thickness of any spot or local area of any type shall not be more than 12.5% under the specified nominal wall thickness.
- The contractor shall specify the pile wall thickness required to avoid damage from all driving activities, but wall thickness shall not be less than the minimum specified.
- No additional payment will be made for furnishing a thicker pile wall than specified on the plans.
- Splices of pipe for cast-in-place pipe pile shall be made watertight and to the full strength of the pipe above and below the splice to permit hard driving without damage. Pipe damaged during driving shall be repaired without cost to the state. Pipe sections used for splicing shall be at least 5 feet in length.
- At the contractor's option, the hooks of vertical bars embedded in the beam cap footing may be oriented inward or outward. The hooks of vertical bars embedded in the pile cap footing should be oriented outward for all seismic categories.
- Reinforcing steel for cast-in-place pile is included in the Bill of Reinforcing Steel.
- All reinforcing steel for cast-in-place pile is included in the estimated quantities for bents.

For Foundation Data table, see Sheet No. 4.

**GALVANIZED OPEN ENDED CAST-IN-PLACE (OECIP) CONCRETE PILE DATA**

<table>
<thead>
<tr>
<th>Bent No.</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1, OECIP Pile (O.D.)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Min. Nominal Wall Thickness</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Pile Point Reinforcement</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Min. Pile Cleanout Penetration (Elev.)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Vertical Bars</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>L1, Length of Vertical Bars</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Upper Stirrup Bars</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Lower Stirrup Bars</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**Stirrup Bar Details:**

- Stirrup Bar welded or seamless steel pipe cast-in-place pile.
- Stirrup Bar welded or seamless steel pipe cut-off elevation (see bent sheets).
- Min. Galvanized Penetration (Elev.) (See Foundation Data).

**Manufacturer Open Ended Cutting Shoe (Inside Flange):**

- Weled or seamless steel pipe cast-in-place pile.
- Cutting Shoe (Inside Flange) steel casting.

**Galvanized Open Ended Cast-In-Place (OECIP) Concrete Pile Data:**

- Effective: May 2023
- Supersedes: Sept. 2020

**Field Fabricated or Commercial Backing Ring with pins:**

- Field fabricated or commercial backing ring with pins.
- Minimum Pile Cleanout Penetration (Elev.) Min.
- Stirrup Bar welded or seamless steel pipe cast-in-place pile.
- Stirrup Bar welded or seamless steel pipe cast-in-place pile.
- Minimum Pile Cleanout Penetration (Elev.) Min.

**Detail of Seismic Stirrup Bar:**

- 45° Hooks (Must lap around the vertical bar).
- Stirrup bar welded or seamless steel pipe cast-in-place pile.

**SECTION A-A:**

- Vertical Bar welded or seamless steel pipe cast-in-place pile.
- Stirrup Bar welded or seamless steel pipe cast-in-place pile.
- Minimum Pile Cleanout Penetration (Elev.) Min.
- 45° Hooks (Must lap around the vertical bar).

**Note:** This drawing is not to scale. Follow dimensions.

**Legend:**

- A
- A
- B1
- D1
- OECIP Pile and Cutting Shoe
- BR
- PILE01
- PILE02_OECIP
Standard Drawing Guidance (do not show on plans):

Do not use 20" and 24" diameter open ended cast-in-place (OECIP) concrete pile without approval of Structural Project Manager or Liaison.

**Typical Data for OECIP Piles**

<table>
<thead>
<tr>
<th>D1, OECIP Pile (O.D.) (by design)</th>
<th>24&quot;</th>
<th>16&quot;</th>
<th>20&quot;</th>
<th>24&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Nominal Wall Thickness (by design)</td>
<td>1/2&quot; (See EPG 751.36.2.2.2 for commonly available nominal wall thicknesses.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pile Point Reinforcement</td>
<td><strong>(add note below)</strong> or &quot;None&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pile Cleanout Penetration (Elev.)</td>
<td>300</td>
<td>300</td>
<td>280</td>
<td>255</td>
</tr>
<tr>
<td>Vertical Bars</td>
<td>6-#5-Vxxx</td>
<td>6-#6-Vxxx</td>
<td>8-#6-Vxxx</td>
<td>12-#6-Vxxx</td>
</tr>
<tr>
<td>L1, Length of Vertical Bars</td>
<td>5'-3&quot;</td>
<td>7'-3&quot;</td>
<td>7'-3&quot;</td>
<td></td>
</tr>
<tr>
<td>Upper Stirrup Bars</td>
<td>3-#4-Pxxx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Stirrup Bars</td>
<td>3-#4-Pxxx</td>
<td>2-#4-Pxxx</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Open ended cutting shoe**

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For LFD seismic performance category (SPC) A and LRFD seismic design category (SDC) A, minimum number of vertical bars, size and length and seismic stirrup bar information is provided in Galvanized Open Ended Cast-In-Place (OECIP) Concrete Pile Data. Modify reinforcement size, length of vertical bars (L1), number of vertical bars, number of stirrup bars, and bar mark information as needed for specific project.

**Min. L1 = 5'-3" for 14"Ø and 16"Ø OECIP & 7'-3" for 20"Ø and 24"Ø OECIP**

**Min. Lower Stirrup Bars = 5-#4 for 14"Ø and 16"Ø OECIP & 7-#4 for 20"Ø and 24"Ø OECIP**

**Min. Vertical Bars = 6-#5 for 14"Ø OECIP, 6-#6 for 16"Ø OECIP, 8-#6 for 20"Ø OECIP & 12-#6 for 24"Ø OECIP**

For SPC B, C and D, modify reinforcement as needed to meet AASHTO 17th edition (LFD) and for SDC B, C and D, modify reinforcement as needed to meet AASHTO Guide Specification for LRFD Seismic Bridge Design (SGS).

**For hard driving conditions consider ASTM A148 Grade 90-60. If cutting shoe is not used, this note may be removed.**

**Use appropriate note based on seismic category** (See EPG 751.50, Notes G5b7a & G5b7b)

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These details of bar array 6, 8 and 12 count, can be used as needed in sheet details “Section A-A” & “DETAIL OF SEISMIC STIRRUP BAR” by using centroid as the handle.