Index 455-154 54" Prestressed / CFRP & SS Post-Tensioned Concrete Cylinder Pile

Design Criteria

AASHTO LRFD Bridge Design Specifications; Structures Detailing Manual (SDM); Structures Design Guidelines (SDG); Fiber Reinforced Polymer Guidelines (FRPG)

Design Assumptions and Limitations

Standard piles are designed to have 1000 psi uniform compression after prestress losses without any applied loads.

The piles are designed to have 0.0 psi tension using a load factor of 1.5 times the pile self weight during pick-up, storage and transportation as shown in the "Table of Maximum Pile Pick-Up and Support Lengths" on the standard.

Plan Content Requirements

In the Structures Plans:

Show and label the piles on the Foundation Layout, End Bent, Intermediate Bent, Pier, Footing, Typical Section and other sheets as required.

Complete the following "Data Table" in accordance with SDG 3.5 and SDM 11.4 and include it in the contract plans with the "Foundation Layout" sheets. Modify table and notes as required to accommodate the required number of piles, piers and/or bents and use of Test Piles. When not enough space is available on one plan sheet, continuations of the Data Table and/or separate pile cut-off elevation tables are acceptable. See FDM 115 for more information regarding use of Data Tables.

For projects without Test Piles change column heading "TEST PILE LENGTH (ft.)" to "PILE ORDER LENGTH (ft.)".
|
|---|---|---|---|---|---|---|---|---|---|---|
| **PILE DATA TABLE** |  |  |  |  |  |  |  |  |  |  |
| **INSTALLATION CRITERIA** |  |  |  |  |  |  |  |  |  |  |
| **PIER NO.** | **PILE SIZE (ft.)** | **NOMINAL BEARING RESISTANCE (ton.)** | **NOMINAL UPLIFT RESISTANCE (ton.)** | **MINIMUM TIP ELEVATION (ft.)** | **TEST PIECE LENGTH (ft.)** | **REQUIRED AXIAL ELEVATION (ft.)** | **REQUIRED]){INSERED}BENDING MOMENT (ton.-ft.)** | **FACTORED DESIGN UPLIFT LOAD (ton.)** | **MINOR AXIAL RESISTANCE (ton.)** | **TOTAL SCOUR RESISTANCE (ton.)** | **NET SCOUR RESISTANCE (ton.)** | **IND.-YEAR SCOUR ELEVATION (ft.)** | **PILE CUT-OFF ELEVATIONS** |
| **PILE 1** | **PILE 2** | **PILE 3** | **PILE 4** | **PILE 5** | **PILE 6** | **PILE 7** |

**PILE INSTALLATION NOTES** (Date: 9-07-93):

Contractor to verify location of all utilities prior to any pile installation activities.

Minimum Tol. Elevation is required for lateral stability.

When a required pile resistance is shown, the pile shall be driven to the elevation and maintained at operation at this elevation unless the pile shall not exhibit signs of settlement or excessive deflections.

The Contractor shall be responsible for determination of the required driving resistance.

All driving shall be allowed without the approval of the Engineer.

The Contractor should not anticipate being allowed to jet piles below the 100-year scour elevation or required jet elevation, whichever is deeper.

For new groups, pile driving is to commence at the center of the group and proceed outward.

**Notes:**
- UPLIFT RESISTANCE - The ultimate pile friction capacity that must be obtained below the 100-year scour elevation to resist uplift of the pile (assumed not when design resistance uplift capacity).
- TOTAL SCOUR RESISTANCE - An estimate of the ultimate static pile friction resistance provided by the scour elevation.
- NET SCOUR RESISTANCE - An estimate of the ultimate static pile friction resistance provided by the scour elevation.
- IN-D.-YEAR SCOUR ELEVATION - Estimated elevation of scour due to the 100-year storm event.

Forced Design Load = Net Scour Resistance + Drift Drag

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## Payment

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<thead>
<tr>
<th>Item number</th>
<th>Item Description</th>
<th>Unit Measure</th>
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<tbody>
<tr>
<td>455-36-AB</td>
<td>Concrete Cylinder Piles, Furnished &amp; Driven (54” Diameter CFRP or SS)</td>
<td>LF</td>
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