STANDARD SPECIFICATIONS

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49 PILING

49-1 GENERAL

49-1.01 GENERAL

49-1.01A Summary

Section 49-1 includes general specifications for constructing piles.

Earthwork for reinforced concrete extensions must comply with section 19-3.

49-1.01B Definitions

control zone: Zone that has the same subsurface profile and engineering properties as a corresponding support location.

nominal driving resistance: Sum of (1) nominal resistance required to resist the factored axial loads and (2) driving resistance from unsuitable or scourable penetrated soil layers that do not contribute to the design resistance.

nominal resistance: Design capacity required to resist the factored axial loads.

49-1.01C Submittals

49-1.01C(1) General

Before handling or installing piles at a location closer than the length of the pile being handled or installed to the edge of a traveled way open to public use, submit a work plan of the measures to be used to provide for the safety of traffic and the public.

Submit a VECP for revisions to specified tip elevations shown or installation methods.

49-1.01C(2) Test Borings

If test borings are specified in the special provisions, submit the log of test borings and the test boring report upon completion of all test borings. Submit 4 copies of the test boring report and the log of test borings to OSD, Documents Unit. The submittal must comply with the specifications for shop drawings. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal.

If corrections to the submittal are required, submit 1 copy of the corrected test boring report and the log of test borings to OSD, Documents Unit.

The test boring report must include:

1. Summary of drilling methods, drilling equipment, drill platforms, and drilling difficulties encountered
2. Location map of the surveyed position of the test borings relative to the new pile locations in the California Coordinate System and bridge stationing
3. Bore hole surveying notes
4. Photographs of rock cores
5. Copies of original daily drilling notes

49-1.01D Quality Assurance

49-1.01D(1) General

Piling must have sufficient length to attain the specified tip elevation shown and extend into the pile cap or footing.

49-1.01D(2) Determination of Length

You may conduct additional foundation investigation, including installing and axial load testing of additional nonproduction indicator piling and performing test borings. Locations of additional foundation testing must be authorized. Notify the Engineer at least 5 business days before starting additional foundation testing.

Complete additional foundation investigation before requesting revised specified pile tip elevations or revisions to the described installation methods.

The following revisions are not authorized:

49-3.02C(3) Temporary Steel Casings

Furnish temporary steel casings where shown and where necessary to control water or to prevent quick soil conditions or caving of the hole. Place temporary casings tight in the hole.

Section 11 does not apply to temporary steel casings.

Temporary casings must be:

1. Watertight and of sufficient strength to withstand the loads from installation, removal, lateral concrete pressures, and earth pressures
2. Noncorrugated with smooth surfaces
3. Clean and free of hardened concrete

Remove the temporary casing during concrete placement. In a dewatered hole, maintain the concrete in the casing (1) at a level of at least 5 feet above the bottom of the casing or (2) at a level above the bottom of the casing adequate to prevent displacement of the concrete by material from outside the casing, whichever is greater.

If slurry is not used, do not withdraw the temporary casing until the concrete head in the casing is greater than the groundwater head outside of the casing. Maintain this positive concrete head during withdrawal of the casing.

You may vibrate or hammer the temporary casing to (1) assist in removal of the casing from the hole, (2) prevent lifting of the reinforcement, and (3) prevent concrete contamination.

The withdrawal of casings must not leave voids or cause contamination of the concrete with soil or other materials.

49-3.02C(4) Reinforcement

Reinforcement for CIDH concrete piles with increased diameters and revised tip elevations must comply with the following:

1. Size and number of the reinforcing bars and hoops, the percentage of bars required to extend to the pile tip, and the size and pitch of spiral reinforcement must be the same as shown for the original piles.
2. Required length of the spiral reinforcement and of any reinforcing bars that do not extend to the pile tip must be at least the length that would have been required for the original specified or ordered tip elevation.
3. Diameter of the spiral or hoop reinforcement must remain the same as required for the original pile or may be increased to provide not less than the concrete cover required for the original pile. Provide positive means to ensure that the reinforcement is centered in the pile.

Unless otherwise shown, the bar reinforcing steel cage must have at least 3 inches of clear cover measured from the outside of the cage to the sides of the hole or casing.

Place spacers at least 5 inches clear from any inspection tubes.

Place plastic spacers around the circumference of the cage and at intervals along the length of the cage under the manufacturer's instructions.

For a single CIDH concrete pile supporting a column:

1. If the pile and the column share the same reinforcing cage diameter, this cage must be accurately placed as shown
2. If the pile reinforcing cage is larger than the column cage and the concrete is placed under dry conditions, maintain a clear horizontal distance of at least 3.5 inches between the two cages
3. If the pile reinforcing cage is larger than the column cage and the concrete is placed under slurry, maintain a clear horizontal distance of at least 5 inches between the two cages

49-3.02C(5) Vertical Inspection Pipes

If the drilled hole is dry or dewatered without the use of temporary casing to control groundwater, installation of inspection pipes is not required.