UNIVERSITY OF SOUTHERN CALIFORNIA
HEALTH SCIENCES CAMPUS
NORRIS HEALTHCARE CENTER
LOS ANGELES, CALIFORNIA

SECTION 03 6323

CAST-IN-PLACE DRILLED PIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Furnishing all labor, tools, equipment, transportation, and performing all operations necessary and incidental to proper execution and completion of all cast-in-place, drilled pier foundations.

B. Related Sections:

1. Section 01 4529 – Testing Laboratory Services.
2. Section 03 2000 – Concrete Reinforcement.
3. Section 03 3000 – Cast-In-Place Concrete.
4. Section 31 0000 – Earthwork.

1.2 DEFINITIONS

A. Pier Length: Total length of drilled pier from bottom of wall, grade beam, or pier cap to the bottom of the drilled pier.

B. Pier Diameter: Diameter of drilling bucket or auger bit, or inside diameter of casing.

1.3 REFERENCES

A. Latest editions of the following standards:

1. California Code of Regulations, Title 24, also known as the California Building Code (CBC) with City of Los Angeles Amendments.
2. Applicable ASTM International (ASTM) Standards.
3. American Concrete Institute (ACI) 301 – Specifications for Structural Concrete for Buildings.
4. ACI 336.1 – Specification for Construction of Drilled Piers.

B. Updated Geotechnical Investigations, proposed Health Care Consultation III and Health Care Consultation IV, USC campus, Los Angeles, prepare by Geotechnologies Inc. Repost #20276, dated July 13, 2012.

1.4 QUALITY ASSURANCE

A. Inspections shall be performed in accordance with Section 01 4529 – Testing Laboratory Services.

B. Testing laboratory shall verify compliance with material requirements.

C. Pier drilling shall be performed under the observation of the project Geotechnical Engineer.

D. Allowable Tolerances:

1. Centerline of drilled piers and reinforcing cages shall be within 3 inches of the location indicated on approved plans.
2. Vertical centerline of drilled piers shall not deviate from plumb by more than 2% of the pier length.
3. In the event that the pier is not satisfactory, the Architect shall establish acceptance criteria on a case-by-case basis and/or work. Contractor shall bear cost of remedial work.

E. Bottom elevations of drilled piers shown on drawings are estimated from soil and bedrock data encountered during geotechnical investigation. The Geotechnical Engineer will determine actual bottom elevation during construction.

1.5 SUBMITTALS

A. Contractor shall submit samples of materials, certificates of compliance, and mix designs.

B. Geotechnical Engineer shall submit drilling logs containing the flowing information:

1. Drilled Pier Identification Number
2. Drilled Pier Diameter
3. Drilled Pier Length
4. Bottom Elevation
5. Top Elevation
6. Bearing strata description
7. Ground water conditions encountered during drilling

C. Testing laboratory shall verify compliance with material requirements

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Comply with applicable requirements of Sections 03 2000 and 03 3000.

1.7 SITE CONDITIONS

A. See project Geotechnical report for site conditions.

Part 2 – PRODUCTS

2.1 MATERIALS

A. Steel reinforcement shall comply with the requirements of Section 03 2000 – Concrete Reinforcement.

B. Concrete shall comply with the requirements of Section 03 3000 – Cast-In-Place Concrete.

C. Casing, if required, shall be of sufficient thickness to withstand all forces without appreciable deformation.

2.2 FABRICATION

A. Fabricate steel reinforcement in accordance with the requirements of Section 03 2000 – Concrete Reinforcement.

B. Provide bracing and ties sufficient to prevent deformation of cages at all times.

C. Provide pick-up points in locations designed to minimize stresses in cages.

PART 3 – EXECUTION

3.1 PREPARATION

A. Perform field engineering and layout Work, including furnishing necessary centerlines, offsets, and grade staked required for piers.

3.2 PIER DRILLING

A. Excavate piers to the design length and elevation shown on the approved plans.

B. Clean pier bottoms to remove loose material prior to placement of reinforcing steel.

3.3 CASING INSTALLATION

A. Install temporary casing where required preventing entry of soil or water into drilled pier excavation.

3.4 WATER REMOVAL

A. Ground water, if encountered, shall be removed prior to placement of concrete.

B. If ground water is encountered during the drilling, contractor may use one of the following methods.

1. Pump the groundwater out prior to placement of the concrete.

2. Place the concrete using the tremie method.

3. Place the concrete using the wet method.

4. If the methods 2 or 3 are used, the contractor should use an approved concrete mix design for wet placement.

3.5 REINFORCING STEEL

A. Reinforcing steel shall conform to Section 03 2000.

B. Handle reinforcing cages in pier hole vertically. Guide cage to prevent contact with sidewalls of pier walls.

C. Hang reinforcing cage from firm supports from top and maintain in centered position during concrete placement.

3.6 CONCRETE PLACEMENT

A. Preparation:

1. Obtain Geotechnical Engineer's approval of drilled pier excavation prior to placement of concrete.
2. Remove water from excavations prior to placement of concrete.
3. Remove loose material prior to placement of concrete.
4. Insure sufficient concrete is on site to complete each pier prior to commencement of concrete placement.

B. Concrete shall be placed in accordance with the requirements of Section 03 30 00 Cast-In-Place Concrete.

C. Place concrete immediately after excavation has been approved by the project Geotechnical Engineer.

D. Place concrete using an elephant trunk to limit free fall of concrete to a maximum of 5 feet.

E. Position elephant trunk in center of pier excavation so that the concrete falls down the center of the reinforcing cage.

F. Place concrete continuously without construction joints for the full height of the drilled pier.

G. Vibrate concrete for full depth of the pier.

3.7 FIELD QUALITY CONTROL

A. The project Geotechnical Engineer shall observe pier drilling and approve drilled pier excavations prior to placement of concrete.

B. The Owner's Testing Agency shall perform all testing of the reinforcement and concrete

C. Any work done without inspection is subject to rejection.

END SECTION 03 6323