Omega Piles

Terremark Data Center
Santa Clara, CA

MALCOLM
Deep Foundations

CONSTRUCTION PERIOD
May to June 2011

CLIENT
Owner: Terremark a Verizon Company
General Contractor: Turner Construction

SERVICES
OMEGA Piles (Drilled Displacment Piles)

2 Each 18 IN Dia Sacrificial Compression Test Piles.

122 Each 18 IN Dia Production Piles to 86 ft depth.

Benefits of Omega Piles

- Increased load capacity in weak soil strata (clays, silts, medium-dense sands).
- Low spoils generation, controlled concrete over break.
- Real-time, continuous quality control of all installation parameters.
- Design data can be correlated to each pile installation.

Project Overview

Malcolm Drilling was awarded the design build contract to install a foundation system for the new Terramark Data Center in Santa Clara, CA in the beginning of May 2011. This new facility was constructed within the existing footprint of a concrete tilt up building next to an operational data center. The roof of the concrete tilt up was removed and the walls were internally and externally braced during construction. To develop and support the pile design, Cone Penetration Tests (CPT's) were performed within the building footprint. Due to the variable soils conditions, all CPT's were conducted in a grid pattern to determine the pile depth across the site. Based on the soil profile generated by the data collected from the CPT's, a preliminary pile design was proposed. This design was verified with two compression load tests within the building foot print. Once the test program was accepted, the production piles were installed using the machines on-board automatic monitoring system.

CONTACT MALCOLM
This job was managed by our Northern California Division in Hayward, California.
For a complete list of office locations and technologies, visit **Malcolmdrilling.com**

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Construction Details

All OMEGA piles were installed using a Bauer BG-28 drill rig equipped with an 18 IN full displacement auger tool. The test program included two compression pile tests, one to a depth of 30 feet and to a maximum compression test load of 350 Kips, and the second to a depth of 54 feet and to a maximum compression test load of 750 Kips. Test piles were not instrumented with tell tales or strain gauges. Only pile head deflection was measured. Both test results exceeded the load carrying expectation of the soil and allowed for design modification. Skin friction values were revised but end bearing was not evaluated since no detailed test data was available. The cooperation between owner and contractor allowed for a quick and effective re-design of most of the production piles within one week allowing production work to start as scheduled. Pile length savings of almost 15% were realized.

Ground Conditions

Conditions at the site consisted of interbedded clays, silts, sand and gravels. There was a presence of moderately expansive near-surface clay, moderately compressible clay of varying thickness with depth, and layers of potentially liquefiable silt and sand with depth. To suppliment the soils report information, Malcolm Drilling performed additional Cone Penetration Tests. Potential liquifiable soils were not encountered on site. Groundwater was measured at a depth of 7 feet below ground surface.

Quality Control

Electronic pile installation reports were submitted on a daily basis to the owner's representative. The reports were generated using software with input from the drill rig's on-board generated installation data wich where instantly uploaded onto the field portable PC. The individual pile reports documented many aspects for the pile installation such as pile depth, drilling times, concrete consumptions, concrete pressure, and concrete volume per lineal foot pile. These reports were used for the final as-built information.

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