

Model 288 Helical Piles

Project: Temporary Beach House Support
Location: Miami Beach, FL
Date: December 2013

Challenge:

A designer beach house conceptualized in 1934 by French architect, Charlotte Perriand, was planned for construction and temporary display outside the prestigious Raleigh Hotel for the 2013 Design Miami Fair. The structure was commissioned by the French luxury group, Louis Vuitton, to be prefabricated in Italy and shipped to Miami for assembly. The beach house would then be disassembled and removed immediately following the fair to allow for an outdoor wedding planned at the hotel. A geotechnical investigation was not performed; however, loose surficial sands over medium dense sands were expected at the site. A deep foundation system was therefore required, which could be easily installed to support the temporary structure, and just as easily extracted after the fair.

Solution:

Helical piles were chosen as the ideal foundation support alternative for the temporary beach house display. Helical piles can be installed quickly and with the precision required to line up the pile head connections with the prefabricated steel framing. Helical piles can also be quickly removed with the same equipment that was used for installation, leaving behind no foundation remnants, spoils or large holes. Eighteen (18) Model 288 (2.875-inch O.D. by 0.276-inch wall) round shaft helical piles with a 10"-12"-14" triple-helix lead section were installed to support design working vertical loads of 4.4 to 14.6 kips (compression) and 2.5 kips (tension) per pile. Four additional battered piles with the same shaft size and helix plate configuration were installed at the corners of the structure to resist a total design lateral force of 6 kips. The piles were installed to depths from 10 to 13 feet below grade to achieve torque-correlated ultimate capacities of at least three times the design working loads (FOS ≥ 3). The battered piles were installed at angles of 30 to 35 degrees from horizontal and to lengths of 20 to 24 feet. The tops of the vertical piles were advanced or cut to a design top of pile elevation 14 inches above grade and fitted with custom new construction brackets. The battered piles were connected to gusset plates on the pile head brackets via a threaded rod and clevis. The steel frame of the beach house was bolted to the pile brackets. Following the fair, the beach house was disassembled and disconnected from the helical piles, and the helical piles were removed to leave the site near its original, undisturbed condition.

Project Summary

Architect: Charlotte Perriand
Structural Engineer: Bromley & Cook
General Contractor: Dimension One
Certified Pile Installer: N Square, Inc.
Products Installed: (18) Foundation Supportworks® HP288 Vertical Helical Piles and (4) Foundation Supportworks® HP288 Battered Helical Piles, 10"-12"-14" Lead Sections, Installed to Depths of 10 to 13 feet, Design Working Loads of 4.4 to 14.6 kips (Compression) and 2.5 kips (Tension), Total Lateral Load of 6 kips



Connecting drive head to helical pile lead section



Advancing battered pile



Beach house framing bolted to helical pile



Battered pile at each of the four corners



Completed beach house