

Models 287 & 350 Helical Piles

Project: Progressive Protein Warehouse Addition

Location: Omaha, NE

Challenge:

A 2,800-square-foot addition was planned to extend the warehouse at four loading dock doors. The geotechnical investigation performed for the proposed addition included the advancement of two soil borings to a maximum depth of 85 feet. The subsurface profile generally consisted of uncontrolled fill with asphalt and brick rubble to a depth of 12 feet, medium stiff to stiff silty clay to a depth of 30 feet, and intermixed layers of stiff to very stiff clay and medium dense to dense silty sand to the bottoms of the borings. Groundwater was encountered at a depth of 68.5 feet at the time of the exploration.

Solution:

Helical piles were chosen as the ideal deep foundation solution to support the proposed addition. Helical piles were selected over drilled piers due to a limited working area and the ability to install helical piles quickly to maintain a tight construction schedule. The deep foundation design included seventy-eight (78) Model 287 (2.875-inch OD by 0.203-inch wall) and six (6) Model 350 (3.50-inch OD by 0.340-inch wall) round shaft helical piles with a 10"-12"-14"-14"-14" helix plate configuration to support design working compression loads from 25 to 50 kips. The Model 350 piles were installed at the proposed column locations with design working loads greater than 25 kips. The helical piles were advanced to depths from 46 to 68 feet to achieve torque-correlated ultimate capacities of at least twice the design working loads ($FOS \geq 2$). During installation, some of the piles encountered concrete debris approximately seven feet below grade, hindering further advancement. The debris was excavated from most areas of the site and replaced with clean fill soils to allow the piles to be installed at the plan locations and design vertical orientation. With the project engineer's approval, other piles were either slightly battered or relocated to avoid the obstructions. The installed piles were fitted with new construction brackets and cast into the columns and grade beams. The helical pile installation was completed in nine days.

Project Summary

Structural Engineer: Stellar Structural Engineering, LLC

Geotechnical Engineer: Thiele Geotech, Inc.

General Contractor: JB Contracting Services, Inc.

Certified Pile Installer: Thrasher, Inc.

Products Installed: (78) HP287 and (6) HP350 Supportworks® Helical Piles, 10"-12"-14"-14"-14" Helix Plate Configuration, Installed Depths from 46 to 68 feet, Design Working Compression Loads from 25 to 50 kips



Existing loading docks



Skid-steer and mini-excavator installing helical piles



Leads and first extensions staged near installed piles



Setting pile elevations within columns and grade beams



Project completed