

Model 287 Helical Piles

Project: Brookhaven Recycling Facility

Location: Yaphank, NY

Challenge:

The Brookhaven Recycling Facility in Yaphank, New York planned an expansion project to increase the size of the existing facility by 12,000 square feet. The 200-foot by 60-foot addition would be a prefabricated metal building supported on cast-in-place concrete footings and foundation walls. The metal building and the foundations would be designed to resist compression loads as well as tension/uplift loads due to wind. For such metal building designs, it is often most economical to simply oversize the footings to increase the dead load of the structure and offset the uplift force. However, deep foundations may also be considered to reduce the dimensions of the footings (pile caps).

A geotechnical investigation at the property included nine soil borings completed to depths of 16 to 22 feet below grade. The general subsurface profile within the area of the addition consisted of approximately five feet of fill soils, loose sand, silt and gravel, underlain by medium dense sand and gravel. The existing fill was determined as unsuitable to support the foundations. One option then included complete removal of the existing fill soils and replacement with compacted and tested fill. Another option included deep foundations, thereby leaving the existing soil in place.

Solution:

Helical piles were selected as the ideal foundation support option for this project. The helical piles would penetrate the loose fill for bearing within the underlying medium dense sand and gravel, effectively supporting the design compression and uplift loads and reducing pile cap dimensions. Product and equipment could be mobilized quickly to the project site.

The foundation design included 75 Model 287 (2.875-inch OD by 0.203-inch wall) round shaft helical piles with 8"-10"-12" triple-helix lead sections to support the design compression and tension working loads of 25 kips. The piles were installed to the maximum recommended torque of 5,600 ft-lbs for the Model 287 shaft, correlating to ultimate pile capacities of at least 50 kips (FOS=2). Pile depths ranged from 10 to 25 feet below the bottom of pile cap elevation. Helical pile installation continued through several sustained rain events and even downpour conditions. Although work was slowed by the weather, Foundation Supportworks® Northeast was still able to install all 75 piles in six days, keeping the project on schedule.

Project Summary

Structural Engineer: Dvirka and Bartilucci Consulting Engineers

General Contractor: Racanelli Construction Company, Inc.

Pile Installer: Foundation Supportworks® Northeast

Products Installed: (75) Supportworks® Model 287 Helical Piles, 8"-10"-12" Lead Section, Installed to Depths of 10 to 25 feet Below Bottom of Pile Cap Elevation, 25 kip Design Working Load



Area for the new addition



Skid steer with telescoping arm used to install helical piles



Helical piles advanced next to the existing building



Helical piles installed along grid line ready to cut to design elevation