

Model 350 Helical Piles

Project: YMCA Swimming Pool

Location: Fond du Lac, WI

Challenge:

In 2009, the YMCA began construction of a 13 million dollar addition. The new addition was to include a new child care area, locker rooms, workout studios and natatorium. The natatorium consisted of a large indoor waterpark including a 29-foot by 76-foot lap pool with shallow and deep ends of 3 feet 6 inches and 9 feet 3 inches, respectively. While making the excavation, the pool contractor encountered weak organic soils at the bottom of pool elevation. The design team then decided to support the pool on a deep foundation system to prevent potential damaging differential settlements. The foundations, exterior walls and roof of the addition were completed prior to excavating for the pool, which created a potential challenge for equipment access. Although several deep foundation systems were considered, helical piles were selected as the ideal option given the limited access, limited anticipated ground disturbance with smaller installation equipment, and the ability to quickly mobilize equipment and product to the job site.

Solution:

Soil borings from the geotechnical investigation identified very stiff glacial till at depths of about 30 to 40 feet. The foundation design included 34 Model 350 (3.5-inch OD by 0.313-inch wall) round shaft helical piles with 10"-12"-14" triple-helix lead sections to support the design load of 65 kips per pile with a factor of safety of 1.5. A temporary earthen ramp was constructed to create access for equipment and materials. The general contractor located and marked the pile locations. Sixteen piles were installed in the deep end of the pool to average depths of 26 feet below pool bottom and 18 piles were installed in the shallow end of the pool to an average depth of 33 feet below pool bottom. The piles were advanced into the very stiff till and to torque values of at least 14,000 ft-lbs, which correlated to an ultimate capacity of at least 97.5 kips. The piles were cut off to the design elevation and specialty new construction brackets were tack-welded to the piles. Foundation Supportworks of Wisconsin installed the 34 piles in two and one half days to an average depth of 37 feet below deck grade. The helical piles were installed within 10 days after Foundation Supportworks of Wisconsin was first contacted about the project.

Project Summary

Certified Pile Installer: Foundation Supportworks® of WI
Products Installed: (34) Foundation Supportworks® Model 350 Helical Piles, 10"-12"-14" Lead Section, Installed to an Average Depth of 37 feet, 65 kip Design Load



Limited access



Helical piles advanced



Piles cut to design elevation



Pile caps are tack-welded



Pile installation complete