Supportworks®

RESIDENTIAL **CASE STUDY**

New Construction Helical Piles

Project: Cottage Foundations

Location: Georgina, Ontario

Compression load test

Challenge:

A 4,000 square-foot family cottage was planned for a lakefront property. A geotechnical investigation identified a general soil profile consisting of approximately 45 feet of marginal silts and sands over 10 feet of competent glacial till. Occasional gravel, cobbles, and boulders were observed throughout the soil profile. Groundwater was measured approximately 5 feet below preconstruction grade. Deep foundations were required to support the structure and minimize the risk of settlement. The owner and the design team preferred a foundation option that would limit construction traffic and disturbance to the site and surrounding properties.

Advancing HP288 helical pile

Solution:

Helical piles were considered to be the most viable deep foundation solution to bear the new structure within the competent soils discovered below the weaker silts and sands. Helical piles can be installed quickly, with little noise, and with relatively small equipment. The original foundation design included 144 helical pile locations with service loads ranging from 5.6 to 95.6 kips. Additional piles were proposed where service loads exceeded 61 kips.

Two full-scale compression load tests were performed on sacrificial piles consisting of 2.875-inch OD and 3.50-inch OD shaft sizes to verify capacities and the deflection-to-load response.

One hundred twelve (112) Model 288 (2.875-inch OD by 0.276-inch wall), forty-six (46) Model 350 (3.50-inch OD by 0.340-inch wall), and three (3) Model 450 (4.50-inch OD by 0.337-inch wall) round shaft helical piles were installed to support service loads ranging from 5.6 to 61.0 kips. The first helix plate on all lead sections was 0.5-inch thick with a “V-Style” cut to help advance the piles past the gravel, cobbles, and boulders observed during the geotechnical investigation. Standard extensions advanced the piles to depths ranging from 48 to 52 feet. The helical piles were installed to torque-correlated ultimate capacities of at least twice the design working loads (FOS ≥ 2.0). Pile installation was completed well within the allotted 21-day working schedule.

Advancing HP450 helical pile

Project Summary

Architect:	Cassidy & Company
Structural Engineer:	Structural Edge Engineering, Inc.
Geotechnical Engineer:	Soil Engineers, Ltd.
General Contractor:	Project & Construction Management, Inc.
Pile Installer:	Foundation Supportworks® of Ontario
Products Installed:	(112) HP288 Helical Piles, 8”-10” and 8”-10”- 12” Helix Plate Configurations; (46) HP350 Helical Piles, 10”-12”-14” and 10”-12”-14”-14” Helix Plate Configurations; (3) HP450 Helical Piles, 10”-12”-14” Helix Plate Configuration; Installed Depths from 48 to 52 feet, Design Working Loads from 5.6 to 61.0 kips

Pile installation complete