

Advanced Installation

Geotechnical Predictive Monitoring Ensures Pile Accuracy

Lakeland, Florida

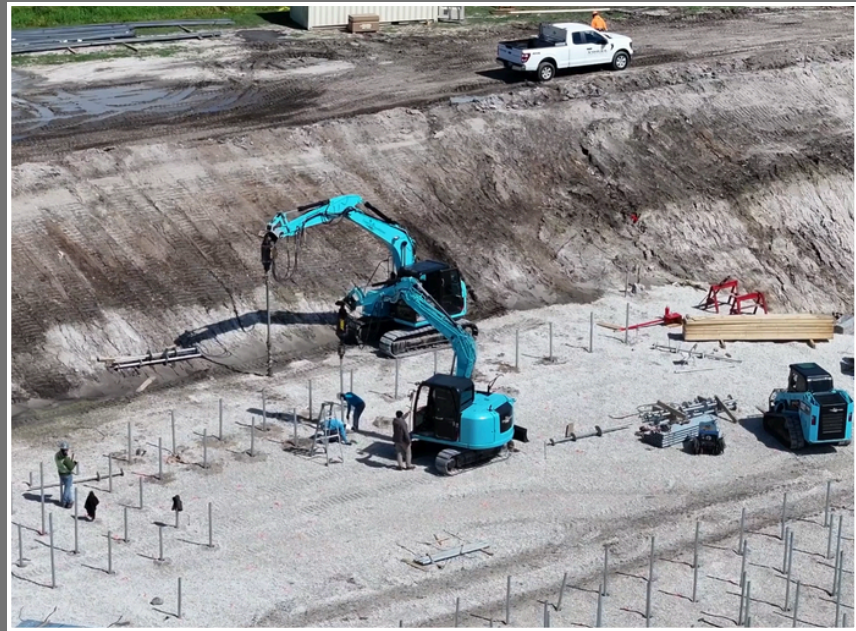
COMMERCIAL PROJECT OF THE YEAR FINALIST

Coastal Foundation Solutions was approached to tackle a sewer treatment plant foundation in Lakeland, Florida. They needed a deep foundation solution that ensured the structural integrity of the plant, especially given the challenging soil conditions.



Constructing this structural foundation posed significant design and construction challenges. The project was particularly demanding as the proposed foundation was to be 25 feet beneath the existing grade, and was only feet away from a flowing creek. The project also included specific areas that required pre-drilling to secure the tension capacities in sufficient soil. The plans initially called for the installation of piles to depths of 21 feet below grade. However, Coastal Foundation Solutions encountered unforeseen subsurface conditions, and required numerous extensions to complete pile installations. The helical piles were installed to depths ranging from 42 to 63 feet below grade.

The initial engineering design proposed a specific load testing system for engineered helical piling. Before full-scale installation, several test piles were installed and subjected to both compression and tension load tests, all of which showed minimal movement and exceeded performance expectations. A total of 670 helical piles were specified at strategic locations throughout the concrete structure to counter the varying soil conditions at depths from 15 to 63 feet.



Coastal Foundation Solutions and the structural engineering group, Dave Baker and Associates, partnered closely with the geotechnical teams to review the loading requirements and provided advanced digital torque indicator monitoring to confirm the pile design efficiency.



Comprehensive soil analysis was conducted, revealing deep fill materials and variable strata. This data guided design adjustments, ensuring each pile achieved optimal bearing capacity.

The helical piles were installed within a two foot thick structural slab. Installation depths ranged from 15 to 63 feet, achieving torque values that correlate to supporting loads exceeding 80,000 lbs. Geotechnical predictive monitoring confirmed target performance metrics during and after installation. Due to varying subsurface anomalies, Coastal Foundation Solutions needed additional extensions for the project. A change order for an additional 1500 extensions secured the completion of the project.



The entire foundation scope was completed within five weeks. Coastal Foundation Solutions streamlined approach enabled the concrete contractor to commence work immediately, eliminating downtime associated with concrete curing.