FOUNDATION SUPPORTWORKS®

CASE STUDY Commercial

PolyLevel® 100SS and Model 288 Helical Piers

Project: Stabilization for Elevator Excavation
Location: Land O' Lakes, FL
Date: May 2015

Challenge:

Renovations to the Pasco County School District Offices included an interior elevator addition within one of the existing buildings. The proposed elevator shaft required excavating up to nine feet of poorly-graded sand. Limited access inside the building impeded conventional excavating/shoring methods; therefore, the soils would have to be stabilized at the proposed elevator location to perform the necessary excavation.

Additionally, the footprint of an existing, 7.5-foot-square column spread footing ran along one side of the proposed elevator pit. The project designers feared the excavation could compromise the column/footing which was supporting a total service load of 150 kips. As a precaution, the designers specified the footing would have to be underpinned before the adjacent soil was removed.

Solution:

PolyLevel 100SS (PL100SS) single-part polyurethane resin was chosen as the ideal soil-stabilizing material. When injected, PL100SS migrates through loose soil and into voids and reacts as it comes in contact with moisture in the soil to essentially "glue" the soil matrix together. The low viscosity and slow reaction time of PL100SS makes it an ideal product for stabilizing sands and other loose soil strata.

A dewatering system was installed to draw the water level below the proposed excavation depths. Two (2) retrofit helical piers were then installed to underpin the adjacent column footing. The helical pier configuration consisted of a Model 288 (2.875-inch OD by 0.276-inch wall) round shaft with an 8"-10" double-helix-plated lead section. The piers were installed to an average depth of 41 feet below grade and fitted with L-shaped, retrofit brackets.

The soil stabilization process included thirty-one (31) injection points spaced around the perimeter of the proposed elevator roughly two to three feet apart. The single-part resin was installed through solid, thin metal tubes (injection pipes) and injected from two feet below the bottom of the excavation to the soil surface in 12-inch lifts. To accommodate varying bottom-of-pit elevations, the resin was injected at starting depths from 9, 10, or 11 feet. With both the perimeter soils and nearby foundation stabilized, the elevator pit was excavated and the renovations continued ahead of schedule and under budget.

Dewatering system installed (white pipes); connecting drive head to helical pier

Preparing for PL100SS injection

Excavation in progress

Completed excavation

Project Summary

Architect: Reynolds Smith & Hill, Inc.
General Contractor: Ajax Building Corporation
Specialty Foundation Engineer: Ramos Engineering & Associates, LLC
Certified Installer: L.R.E. Ground Services, Inc.
Products Installed: Approximately 154 gallons of PolyLevel 100SS (PL100SS) Single-Part Polyurethane Resin; (2) FSI HP288 Helical Piers, 8"-10" Helix Plate Configuration, Average Pier Depth of 41 feet