FOUNDATION SUPPORTWORKS™

CASE STUDY Commercial

Model 288 Push Piers

Project: Renovation of The Crossing
Location: Madison, WI
Date: July 2010

Challenge:

The Crossing is a facility owned by The Wesley Foundation. In 2010, the building was to undergo a 1.6 million dollar renovation to include the construction of a new elevator so that it would comply with current ADA requirements. The new elevator shaft was proposed in the northwest corner of the basement. Excavation for the new elevator pit would undermine an existing column footing as well as approximately 17 feet of exterior wall footing. The estimated design working load on the existing column was 68.3 kips and the estimated design working load for the exterior wall was 3.4 kips per foot.

Two options were considered to provide the necessary vertical support for the structure during the excavation and construction of the elevator pit; helical piers and hydraulically driven push piers. The push piers were selected as the more favorable foundation support option given the limited access. A temporary exposed/unsupported length also had to be considered in the pier design with the proposed excavation depth extending 4 feet below the bottoms of the existing footings. Test borings from a nearby project site indicated a suitable bearing stratum at a depth of 15 to 20 feet below the ground surface.

Solution:

Nine (9) Model 288 Push Piers were included in the design to underpin the wall and column. Six piers were driven individually along the wall to hydraulic pressures of at least 2,200 psi (ultimate capacity ≥ 21 kips). These piers were then connected in series and simultaneously reloaded and locked off at a hydraulic pressure of 1,500 psi to support a design working load of 14 kips per pier (FOS≥1.5). Three piers were driven to support the column load, one on each of three faces of the column footing. The column piers were driven to pressures of at least 3,600 psi (ultimate capacity ≥ 34 kips) and then locked off at 2,400 psi to support a design working load of 23 kips per pier (FOS≥1.5). The nine piers were driven to depths of 13 to 19 feet below the bottom of footing elevation. The prep work, pier installation and clean up were completed in two days.

Project Summary

Architect: Knothe & Bruce Architects, LLC
Structural Engineer: SRI Design
General Contractor: McGann Construction, Inc.
Certified Pile Installer: Foundation Supportworks of WI
Products Installed: (9) Foundation Supportworks™ Model 288 Push Piers, Installed to Depths of 13 to 19 feet Below the Bottoms of Footing Elevation, Design Working Loads of 14 kips and 23 kips


Limited access in area of proposed elevator pit


Footings notched and prepared for bracket installation


Piers driven to ultimate loads


Pressure log generated for each pier during installation


Piers connected in series and uniformly reloaded to the design working load