

Model 288 Push & Helical Piers

Project: Camelot Apartment Complex
Location: Colorado Springs, CO
Date: February 2010

Challenge:

The Camelot Apartment Complex was constructed in 1977 and consists of 13 multi-unit buildings, each building with approximate plan dimensions of 220 feet by 35 feet. The two-story wood-framed buildings were reportedly supported on poured concrete foundation walls and footings. Construction details also included dirt floor crawl spaces with heights of about 24 inches from the soil to the bottom of the floor joists. Over the years, three of the buildings settled as much as 18 inches over the 220-foot length and were since vacant for more than two years due to the excessive settlement and damage to the structures and utilities. New property owners invested more than \$150,000 in cosmetic and safety upgrades within these three buildings before the settlement issue was identified. Therefore, the owners asked to only stabilize the foundations rather than lift the buildings back toward their original positions and risk damage to the repaired areas. Because there was no soil information available, two push piers were driven to estimate depth to the local claystone bedrock. Two helical piers were also advanced to estimate the depth where at least 4,000 ft-lb of installation torque would be achieved. Excavations of the foundation also discovered that there were no footings supporting the foundation walls. The foundation walls were poured directly over void form without any additional bearing support.

Solution:

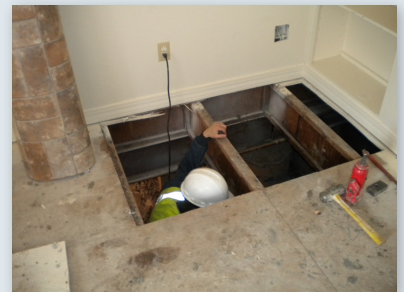
Peak Structural installed a total 101 Foundation Supportworks™ Model 288 Push Piers to depths ranging from 35 to 42 feet. The push piers were installed along the exterior walls, but from within the crawl spaces of the three buildings. The complex owner opted for an interior pier installation in order to avoid removing and replacing the exterior sidewalks surrounding each building. Due to the tight, low-headroom working conditions, portions of the subfloor had to be removed at each pier location in order to accommodate the hydraulic equipment used to drive the piers. The piers were spaced at eight to nine feet and installed to an average driving force of more than 48,000 pounds, exceeding the 15,000 to 20,000 pound design loads by factors of safety greater than two. Sixteen Foundation Supportworks™ Model 288 Helical Piers were advanced to depths ranging from 14 to 17 feet to support interior columns. The helical pier lead section consisted of a 10-inch single helix. The ultimate capacities of the helical piers, as estimated by correlation to installation torque, exceed the design loads by factors of safety of 2 or more. The 117 piers were installed in ten days.

Project Summary

Structural Engineer: Michael Orsillo, PE
General Contractor: Loverns, Inc.
Certified Pier Installer: Peak Structural, Colorado Springs, CO
Products Installed: (101) Foundation Supportworks™ Model 288 Push Piers and (16) Foundation Supportworks™ Model 288 Helical Piers, Push Piers Installed to Depths of 35 to 42 feet, Helical Piers Installed to Depths of 14 to 17 feet, 15 to 20 kip Design Loads



Camelot Apartment Complex



Removal of subfloor for pier installation



Pier installations completed in tight conditions



Pier installations completed in tight conditions