FOUNDATION SUPPORTWORKS®

CASE STUDY Commercial

Model 288 Retrofit Helical Piers

Project: Commercial Building Stabilization
Location: Cape Coral, FL
Date: August 2016

Back wall of white building settling toward corner in foreground

Stair-step crack from building corner interior

Challenge:

The back wall of a 100-foot-long, single-story building had differentially settled one inch toward one of the rear corners. The settlement was evident by horizontal and stair-step cracks observed in the exterior block walls. Plans to rebuild the settling corner of the building were considered; however, the owner desired a more permanent solution and chose to have the existing structure stabilized and lifted back to level, if possible.

The geotechnical investigation included a single soil boring advanced in front of the building which identified approximately 23 feet of loose sands, underlain by medium dense sand to the maximum explored depth of 25.5 feet below grade. The water table was observed at seven feet below grade at the time of drilling.

Solution:

Retrofit helical piers can be installed with relatively small equipment. They were chosen as the ideal solution for this project given the limited alley access and overhead electric lines. The support system design included eleven (11) Model 288 (2.875-inch OD by 0.276-inch wall) round shaft helical piers with 10”-12” double-helix lead sections. The helical piers were installed on each side of four, 12-foot-wide bay doors and six feet on-center along the rear wall of the structure, resulting in individual design working pier loads from 12 to 20 kips. A single, 10-kip helical pier was installed on the side wall of the settled corner, two feet from the rear wall. The retrofit piers were installed to depths up to 21 feet below the bottom of the wall footings to achieve torque-correlated ultimate capacities exceeding twice the design working loads (FOS > 2). Each pier was fitted with a retrofit bracket and a 30-inch-long external sleeve. Hydraulic cylinders were then connected to the brackets to uniformly load and lift the settling portion of the building to its original elevation. The pier sections and bracket components were hot-dip galvanized for corrosion protection. Both the pier installation and structural lift were completed within two days.

Installing helical pier lead section

Advancing helical pier within alley

Project Summary

Structural Engineer: TKW Consulting Engineers, Inc.
Geotechnical Engineer: Ardaman & Associates, Inc.
Certified Pier Installer: N Square, Inc.
Products Installed: (11) Foundation Supportworks HP288 Helical Piers, 10”-12” Helix Plate Configuration, Design Working Compression Loads from 10 to 20 kips, Installed Depths up to 21 feet Below Footing