Foundation Supportworks®

COMMERCIAL **CASE STUDY**

Model 350 Helical Piles

Project: Joe's Crab Shack Repair

Location: Fort Myers, FL

Joe's Crab Shack

Challenge

Joe's Crab Shack, built in 1983, is a single story structure with approximate plan dimensions of 80 feet by 120 feet. The building extends from the shoreline over inlet waters on a combined foundation system. The area of the building over land is generally supported on round wood columns, wood beams and wood floor joists. The area of the building over water was constructed with precast concrete floor panels, concrete beams and twenty-two (22) 14-inch square precast concrete piles. Eleven (11) of these concrete piles were severely deteriorated with spalling concrete and corrosion of the reinforcing steel. The existing structure needed to be temporarily supported while these concrete piles were repaired. A single test boring was completed from the shoreline to a depth of 50 feet. A generalized subsurface profile consists of very loose to medium dense silty and clayey sand to 36 feet over stiff to very stiff sandy clay to the bottom of the boring.

Setting handheld equipment onto helical pile

Solution:

The support solution had to be installed beneath the structure in limited access and low headroom conditions, and could not significantly affect or disturb the marine habitat and the operation of the restaurant. Helical piles appeared to be a practical solution given the difficult installation conditions. Helical piles could be installed with handheld equipment with little disruption to the surrounding area. The piles could also be removed following the repair work. Forge Engineering, Inc. consulted with the engineering staff at Foundation Supportworks® to develop an adjustable top detail for the piles so the vertical load from the structure could be easily applied and then removed. Components of the SmartJack® system, a supplemental crawlspace support system, were modified for the proposed pile shaft. The support system design included 29 Model 350 (3.5-inch OD by 0.340-inch wall) round shaft helical piles with 10"-12"-14" triple-helix lead sections to support a design working load of 10 kips per pile. Buckling of the piles had to be considered due to the exposed lengths and anticipated soft soil conditions at mud line. The helical piles were installed with handheld equipment to torque-correlated ultimate capacities of at least 20 kips (FOS ≥ 2). Pile lengths varied from 25 to 50 feet across the building footprint. The piles were installed and the support system completed in nine working days despite the difficult working conditions, high tides and occasional late summer storms.

Temporary support completed

Project Summary

Marine Consultant: Forge Engineering, Inc.
Forensic Engineer: Forge Engineering, Inc.
Geotechnical Engineer: Forge Engineering, Inc.
Pile Installer: Alpha Foundations
Products Installed: (29) Foundation Supportworks® Model 350 Helical Piles with Modified SmartJack® Components, 10"-12"-14" Lead Section, Pile Lengths of 25 to 50 feet, 10 kip Design Working Load

Completed job