



Owner: Tavern Hospitality Group
Location: Denver, Colorado
General Contractor: Catamount Constructors
EOR: Foothills Structural Engineering, Inc.
Specialty Engineer: Smith Engineering | Brian Smith (318) 741-1088
Contract Amount: \$343,835.32 | **Maximum Pile Load:** 30 kips | **Completion Date:** July 2014

PROJECT SUMMARY

Tavern Platt Park

Project Description: The Tavern Hospitality Group of Denver, Colorado, bought a building on historic South Pearl Street, just south of downtown Denver. Catamount Constructors was charged with demolishing the existing building and constructing a new Tavern restaurant. The original 2-story building was built in the early 1900's. Portions of the existing basement wall were to be salvaged for the foundation of the new restaurant that was being built. The design of the new restaurant called for one of the existing basement walls to be underpinned in order to support the design loads of the new structure. Two other existing basement walls were being utilized for shoring for the excavations against the street and adjacent building. New helical steel piles were installed around the perimeter of the new basement foundation wall to provide the needed foundation support. Also, a series of helical piles were installed

at various locations throughout the basement to support concrete footings and pile caps.

Subsurface Conditions: The project was located less than a mile east of the South Platte River, which runs through Denver. A geotechnical report was provided prior to bidding the project. It was believed there was a very fine gravel and sand layer that would be encountered at a depth of 17'-25'. The water table was found just below that depth where very loose sands were present. The target depth for the helical piles was 70' deep, where bedrock was found.

Design Details: Prior to bidding the project, Power Lift was given information about the construction of the adjacent restaurant. It was conveyed to Power Lift, the company that installed the helical piles to support the adjacent restaurant had to pre-drill each pile in order to install the piles



PROJECT SUMMARY — TAVERN PLATT PARK (CONTINUED)

to the required depth. Based on the information supplied in the soil report for this project, Power Lift's engineer designed the piles to withstand an increased amount of torque so the piles would not need to be pre-drilled in order to penetrate the fine gravel/sand layer. Once installation began, Power Lift encountered difficulty penetrating the problematic layer. After many attempts utilizing different techniques to penetrate the layer, Power Lift surmised that the layer was not fine gravel/sand as reported. Power Lift personnel next reported that actual field conditions were not consistent with the materials identified in the original soil boring which was taken in the alley behind the structure. Catamount Constructors and Power Lift

consulted with the EOR as well as the geotechnical engineering firm who performed the subsurface investigation. A decision was made to have two additional soil borings conducted to better identify the subsurface conditions. The original dense layer reported to be fine gravel/sand was actually a thick layer of gravel and boulders. The results of the new borings proved Power Lift's assumptions to be correct. Based on the new investigation, Power Lift had to reconfigure their approach to the project. Power Lift's CAT 325BL hydraulic excavator, along with our 80k ft/lb drive head were transported to Colorado. To solve the issues resulting from the rock layer, Power Lift installed a 5" O. D. pile to push the rock and cobbles out of the way so that the 3" O. D. piles could be installed. This allowed the 3" O. D. piles to be advanced to the original design depth of 70'. However, installing, then removing the 5" O. D. pile created a void around the 3" O. D. piles, which significantly reduced the pile's lateral stability. To resolve this issue, Power Lift drilled a 9" O. D. x 15' deep hole around each pile and pumped flowable grout to create a concrete shaft around the pile. Once all piles were grouted and secured, the piles were cut to the correct elevation, and steel new construction pier caps were installed. Foundation construction then proceeded as planned.

