181 Fremont

San Francisco, CA

The Lower Rebar Cage Arrives on the Job Site

Changing the Skyline in San Francisco

181 Fremont, designed by Heller Manus Architects, will be a mixed use skyscraper with retail space on the lower 33 floors and residential space on the upper 15 (Park 181). The tower will have 54 stories altogether. Including the spire, the building will be 802 feet tall. The building will be located near the Transbay Transit Center and the Market section of downtown.

Drilling the Test Shaft

Loadtest provided full scale load testing equipment and services for the deep foundation drilled shaft on the 181 Fremont project. City and Engineer considered load testing vital to the project due to the large loads, project significance and uncertainty with regard to soil and rock capacities.

Project Info	
Owner:	Jay Paul Company
Client:	Malcolm Drilling
Prime:	Level 10 Construction
Engineer:	ARUP
Project Cost:	$500,000,000 (est.)
Completion Date:	2016

Services Provided

- O-cell Test Design
- Assembly and Installation of O-cells and Instrumentation and Integration into Drilled Shafts
- Testing, Analysis and Reporting of Load test Results

Very little is known about the carrying capacity of the complex rock system at depth. The foundation system as designed, consists of multiple deep drilled shafts, some as deep as 270 feet. The test shaft construction was started by oscillating down a segmental casing to a depth of nearly 100 feet. The shaft was then drilled with an auger and bucket under polymer slurry to a depth of 262 feet.

Loadtest assisted in the early test design phase. The production shaft was designed to be incorporated into the foundation system. Making design and planning even trickier, the reinforcing cage was to be assembled over the excavation in multiple spliced sections. The successful installation and concreting ended up taking over 24 hours.

In December, 2013, Loadtest tested the 262 feet deep drilled shaft. The 6 feet diameter shaft was socketed 30 feet into rock (Franciscan Formation, Mélange) with the O-cells located 20 feet above the shaft base. Using three 24-inch O-cells on a single plain Loadtest applied a load of 18,400 kips. Maximum movements above and below the O-cells were 3.4 and 0.6 inches respectively. The displacement, strain gage and load data was analyzed to obtain t-z curves in 16 zones and q-z curves. The load test reports and the contained data and analyses allowed ARUP to redesign the foundation for maximum economy, safety and functionality.