

# Transbay Tower

San Francisco, CA



View of the San Francisco Skyline from the Transbay Tower Job Site

## Changing the Skyline in San Francisco

Transbay Tower, designed by architect Cesar Pelli, will be a mixed use skyscraper and will stretch into the clouds at a future rail hub that developers describe as a Western Grand Central Station. The tower will have 61 stories and reach 1,070 feet into the sky, making it the tallest building west of the Mississippi River. The small lot used to be a passenger waiting, loading and drop-off area for the old Transbay Terminal.



Lower Rebar Cage with O-cells Lowered into Excavation

The small (50,000 sqft.) lot was sold to Hines for \$235 million.

Loadtest provided full scale load testing equipment and services for the deep foundation load bearing elements (LBE) on the Transbay Tower project. The owner, City and Engineer all considered load testing vital to the project due to the large loads, project significance and uncertainty with regard to soil

Project Info	
Owner:	Boston Properties Inc. / Hines
Client:	Bencor of America
Prime:	Clark / Hathaway Dinwiddie A Joint Venture
Engineer:	ARUP
Project Cost:	\$1,000,000,000 (est.)
Completion Date:	2018

Services Provided
<ul style="list-style-type: none"><li>■ O-cell Test Design</li><li>■ Assembly and Installation of O-cells and Instrumentation and Integration into LBEs</li><li>■ Testing, Analysis and Reporting of Load test Results</li></ul>

and rock capacities. The foundation system as designed, consists of multiple rectangular LBEs as deep as 300 feet.

Loadtest was instrumental in the early test design phase. The production LBEs were designed to be incorporated into the foundation system and included very complex reinforcement. The reinforcing cage was assembled over the excavation in multiple spliced sections. The installation was difficult and time consuming. It took over twenty hours.

In late 2013 and early 2014, Loadtest tested a 250 and 290 feet deep LBE. The panels were 10.5 feet long and 5 feet wide. The first LBE was socketed 10 feet into rock (Franciscan Formation, Mélange) and the second, 50 feet.

Using eight 24-inch O-cells on a single plain in the first LBE and six 24 inch O-cells in the second, Loadtest applied loads of 17,400 kips and 27,800 kips respectively. Movements were small in the upward direction and over 6 inches down. 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 foundations for maximum economy, safety and functionality.