



HUDSON YARDS

MANHATTAN, NEW YORK, USA

Referred to as 'The Final Frontier' in real estate market, Hudson Yards is transforming 28 acres of western Manhattan into a dream city. Viewed as the largest private real estate development in the history of the United States, Hudson Yards brings together culture, commerce & cuisine, with an engineering marvel that pairs style with sustainability and a convergence of parks and public space.

Upon completion, the site will include more than 17,000,000 ft² of commercial, residential developments and 14 acres of open park space. Also included are a cultural venue, 750-person public school and 200-room luxury hotel.

The Hudson Yards subsoils are primarily near surface soft clay and silts underlain by a bedrock of Gneissic Schist. Loadtest assisted East Coast Drilling New York (ECDNY) in testing 6 test caissons; 48-inch diameter, a 42-inch rock socket and varying lengths from 66 to 150 feet.

Fugro Loadtest worked with the team to acquire the geotechnical information needed for design optimization. The goal was to gather information about the side shear and end bearing values in the rock socket. A program was planned to provide instrumented O-Cell[®] assemblies located at the shaft tips to evaluate the compression capacity. These assemblies included special bond-breaking casing to isolate the upper portion of the rock socket shear resistance limiting the applied loading to the lower rock socket area. Lateral load tests were then carried out in 3 additional shafts using the

PROJECT INFORMATION

- Owner: The Related Companies L.P., Oxford Properties Group Inc.
- Architect: Kohn Pedersen Fox
- General Contractor: Tishman Construction, Tutor Perini
- Completion Date: December 2022
- Project Cost: \$1 billion (Estimated)
- Geotech Consultants: Langan; Mueser Rutledge Consulting Engineers
- Capacity Achieved: 17,200 kips

SERVICES PROVIDED

- 3 single level O-Cell load tests
- 3 lateral load tests
- Load test program design

O-Cell axially tested caissons as reactions. The static and lateral tests were performed one week after concrete placement.

The axial O-Cell tests indicated average combined side shear and end bearing resistance of 17,600 kips was available for design optimization. The lateral tests yielded an average maximum load of 250 kips. The geotechnical engineer then used this information to optimize (value engineer) the deep foundation design retrieving value for their client.



O-Cell assembly



Lateral load test setup



Installing the O-Cell assembly