

## 30 HUDSON STREET/GOLDMAN SACHS TOWER

Jersey City, NJ



**A**t the end of the 1990s, investment banking firm Goldman Sachs was evaluating possible locations for a new multi-use office complex. The firm was experiencing a staggering period of growth — and was predicting a sizeable increase in its number of employees by the end of the decade. Already at maximum capacity at the current headquarters, the firm had employees scattered across various locations throughout Manhattan. The new office complex would help to accommodate future growth and bring the current employees in various offices back together in one location.

When the Colgate Company announced its plans to redevelop its Jersey City plant site into a waterfront business park, Goldman Sachs signed on to construct its new office complex in the area. The new business park, known as the Colgate Redevelopment District, was a brownfield site. Brownfield sites are pieces of land that were previously used for industrial purposes and are typically contaminated by hazardous waste or pollution. The Colgate Redevelopment District, like many brownfield sites, had been rehabilitated through extensive soil remediation and was primed for redevelopment.

**Owner:**

Goldman Sachs

**General Contractor:**

Turner Construction

**Technique(s):**

Diaphragm Walls, Tieback Anchors

**Subsurface Conditions:**

Manhattan Schist: shales, slates, phyllites, contaminated brownfield soils

**Approximate Key Quantities:**

Diaphragm Wall	77,052 square feet
Rock Bolts	324
Tieback Anchors	490



*Anchor installation through diaphragm wall (left)  
Diaphragm wall excavation with clamshell (right)*

Goldman Sachs chose the Colgate Redevelopment District as the site of its new complex to contribute to the revitalization of the once run-down area and to make a positive impact on the Hudson Watershed environmental conservation efforts.

As early adopters of “green” building principles, Goldman Sachs’ new tower was designed to be as environmentally friendly as possible.

## PROJECT BACKGROUND

Construction began on the new Goldman Sachs Tower in 2000. The design for the 42-story, 1.5 million-square-foot building included offices, a full-service cafeteria, a full-service wellness facility and a four-story, below-grade parking lot with the capacity to hold up to 1,400 vehicles. Both above and below-grade solutions were considered in order to provide adequate parking for the complex. Ultimately, the below-grade option was chosen, though the construction of a below-grade parking lot in such close proximity to the waters of the Hudson River required special considerations.

Several foundation options were considered in order to accommodate the below-grade

parking garage. Ultimately, a diaphragm wall system was chosen due to the subsurface conditions of the site, which included a historical river-front bulkhead, old foundations, the dense Manhattan Schist formation and a high ground-water level. This solution required a massive excavation of rock and soil, which had been contaminated by industrial byproducts. The contaminated soils had to be removed and taken to a special containment site for disposal. The benefit of this solution was that it yielded a contamination-free, clean site — one that did not leave the owner liable for future site complications related to contamination.

## THE WORK

Nicholson was contracted, as part of a Joint Venture with E.E. Cruz, to build the water-tight bathtub that the Goldman Sachs Tower would rest on. The building’s footprint measured approximately 460 feet by 380 feet and the diaphragm wall depths ranged from 36 feet to 60 feet below grade. A bathtub was constructed using a 30-inch thick anchored diaphragm wall and bentonite slurry for support. The wall was founded in the mica schist to ensure a positive water cut-off and provided support for the basement level floor slabs.

Significant variations in the underlying rock were found during construction of the diaphragm wall. These unexpected variations required modifications to the original design. At the southwestern corner of the site, an unexpectedly deep seam of decomposed rock was encountered, which required the deepening of several diaphragm wall panels. The east wall also proved to be challenging, with multiple obstructions encountered where the diaphragm wall and old, timber-crib bulkhead met. To support the 77,500-square-foot diaphragm wall, 490 temporary rock anchors with capacities up to 600 kips were installed.

In addition, excavation and disposal of the contaminated and uncontaminated soil, rock bolting of exposed rock walls, geotechnical instrumentation and dewatering were included in the scope of the work.

## THE RESULT

The project required excavation of rock-filled timber bulkheads and excavation of the mica schist bedrock for construction of the reinforced concrete diaphragm wall. It also required construction of anchors below the water table in the highly permeable ground immediately adjacent to the river and protection of the newly constructed New Jersey Light Rail System, which was located immediately adjacent to the western building line. All challenges were addressed and overcome by Nicholson to provide a solid foundation for the Goldman Sachs Tower which is the centerpiece of the revitalized Jersey City area.