



## Project Scope

The Cartier Mansion is a pair of opulent private residences combined into one retail space. They were built after the demolition of the Roman Catholic Orphan Asylum. The east portion on 52nd Street was a town house built in 1905 for Edward Holbrook and his family. It was soon overshadowed by the ostentatious Morton Plant mansion completed shortly thereafter. Plant traded the Italianate palazzo to Pierre Cartier for \$100 and a string of flawless pearls in 1917. The townhouse changed hands several times, finally becoming a commercial property acquired by Cartier in 1927 as the neighborhood changed from the residences of millionaires to retail and hotels. The two structures were operated as separate entities until 2000, when they were connected by a renovation. The mansion was designated a New York City Landmark in 1970.

As part of a more comprehensive renovation from 2014 to 2016, the mansion and townhouse were more completely merged and reconfigured as a more cohesive retail space. Plan B Engineering designed and administered a complex shoring system to support the building and assist with installation of new structural elements. The system braced walls, supported roofs, needed openings and hung girders. It required constant revision and adjustment as more structural elements, unique conditions and interim renovations were discovered during demolition. As the project progressed, scheduling conflicts and architectural changes necessitated additional coordination, revision and detailing.

The mansion's upper floors, after demolition, were found to be deficient. The first step was to shore the slabs to remain and overpour a concrete slab for strength and stiffness. Temporary deep footings in the subcellar provided anchorage for columns supporting enormous transfer girders which in turn, supported lateral bracing panels and shoring. Of particular importance was a series of large needle beams at the party wall between the mansion and townhouse so that a new portal frame could be installed and the buildings truly connected. Even the bulkhead and water tank required support as part of the renovation.

The mansion and townhouse floors didn't align, even after the 2000 renovation, so Plan B Engineering developed a sequence of installation, demolition and bracing to remove the townhouse floors and replace them in the correct positions while minimizing the amount of bracing required. Supporting the new floors became a challenge as the townhouse's exterior wall was discovered to be a single wythe of brick rather than a party wall.

## Project Expertise

- Scaffolding
- Demolition
- Historic Stabilization
- Overhead Protection
- Shoring and Bracing
- Pedestrian Protection
- Rigging
- Safety and Access
- Hoisting and Runback Platforms
- Temporary Enclosures
- Netting
- Jacking

Innovative Structural Engineering Solutions