



The PowerHouse - BIM to the future: Wexler Associates' simplified project delivery

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Located along the East River at 50-09 Second St., The PowerHouse is situated one block from the waterfront and one subway stop from Manhattan on the 7 line. The PowerHouse, built in 1906 was a part of the world's most extensive power-generating system for the electrification and expansion of the Long Island and Pennsylvania Railroads. The firm of McKim, Mead and White was the project architect, with the engineering firm of Westinghouse, Church, Kerr & Co. responsible for the building's structural design. In the 1920s, the building's imposing structure caught the eye of famed artist Georgia O'Keefe, who made it the subject of her painting, across the East River. The station used steam turbines to boil water for steam power. Upon the opening of Penn Station, it was providing over 32,500 KW of energy into the train tunnels. This grand structure is being converted into the PowerHouse Condominium - a luxury building consisting of 427 residential units.

The original proposal was to raze the historic PowerHouse, which would have saved \$40 million, but the community outcry convinced the developer into preserving at least some of the original building. This \$200 million project that is being developed by CGS Developers, renowned architect Karl Fischer and designer Andress Escobar is going up in two phases. Phase one, just recently completed, consists of an 11-story, 240,000 s/f building and 177 residences. Phase two will include 250 additional residences. When completed by 2010, the project will have 340,000 s/f and include a Smithsonian-affiliated museum, a 168-room hotel and a conference facility, and the building, decommissioned in the 1980s, will retain some of its exterior architecture.

Using BIM simplified project delivery. With BIM, the structural design and steel shop drawings were prepared in house by Manhattan based structural engineering firm - Wexler Associates.

The advantage of BIM for renovation projects cannot be over emphasized. On large renovation projects where existing conditions are exposed during construction, hundreds, if not thousands of RFIs may be required. With BIM there are no RFIs. All questions are taken and answered in house.

The structural design included the following:

1. Demolition and structural stability, removal of existing chimneys, coal hoppers, cranes and other miscellaneous structures. Temporary bracing of tall masonry walls, was provided.
2. Evaluate and reuse the existing pile and mat foundations. Limit column loads where needed due to foundation capacities.
3. Design the new building addition.
4. Add floors and mezzanines within the existing envelope.
5. Detail and design reinforcement, shoring, bracing, needling and reconstruction of existing masonry walls where new architecture was required.
6. Add reinforcement for wind and seismic, to comply with New York City Building Code.
7. Prepare drawings and obtain needed approvals from the New York City Transit Authority.

8. Observe construction progress and assist with modified designs, as needed due to existing conditions.

9. Provide 3D Modeling and Shop Drawings for Steel Fabrication. Provide redesign and revised shop drawings due to field conditions.

At Wexler Associates, BIM has been used for the last five years, and many millions of sq. ft. of new buildings have benefited from BIM each year. Wexler Associates may be the only consulting structural engineering firm on the island of Manhattan with in-house BIM design and steel fabrication capabilities. As seen on the PowerHouse project, BIM to the Future saved significant time and money and delivered simpler projects.

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