

DeSimone

THE NEW YORK HISTORICAL RENOVATION AND EXPANSION

PROJECT ROLE: STRUCTURAL ENGINEER

DeSimone's structural engineers designed a long-span composite steel and cast-in-place concrete structure, including a 70-foot steel truss, to create light-filled, expansive, column-free spaces for galleries, public programs, events, and classrooms in the new Tang Wing for American Democracy. Close collaboration with the project team helped realize the architectural vision, visually and physically integrating the new wing with the three existing landmarked structures. Significant structural interventions and modifications created open, contiguous spaces for a cohesive, exceptional visitor experience.



PHOTO: RAMSA

PROJECT OVERVIEW:

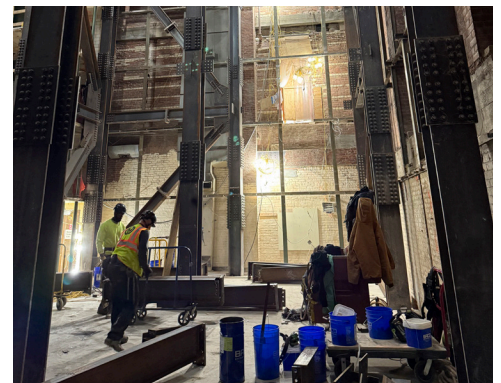
- The project involved two key parts: the renovation and adaptation/retrofit of the original building, wings, and library stacks tower, and the integration of the existing structures with the new Tang Wing, which includes four floors, a rooftop terrace, and a courtyard.
- Our engineers were able to reference the original building drawings because The New York Historical had saved and carefully catalogued them.



PHOTO: RAMSA

KEY STRUCTURAL ENGINEERING CHALLENGES:

1. As structural engineers, our role was critical to renovating the landmarked 1908 main building and 1930s additions, designing the structure of the new Tang Wing and integrating it with the existing structures, which included designing a 70-foot truss to create open, column-free, flexible spaces for exhibits, public programs, and events.
2. We introduced a transfer structure at the fifth floor of the existing 15-story steel-and-cinder-slab library stacks tower to align and connect the tower with the new wing for expansive gallery space. We removed the first-floor slab and installed a new slab at a higher elevation, then removed the second-, third-, and fourth-floor slabs below, leaving 11 stories total.
3. Numerous existing columns, spaced approximately four to five feet apart, also posed a significant challenge. We introduced four layers of steel beams below the columns, transferring the column loads to this new framing system and down to the foundations, before cutting the columns at the lower ends — creating a multi-story, open gallery space below.
4. In renovating the existing three-story historic structure, we temporarily jacked a column resting on an existing foundation wall to transfer its load to a new 34-foot steel transfer beam. This enabled us to remove the wall, creating a contiguous cellar space connecting the historic building with the new wing for education and research.
5. The same Sherwood Pink Granite quarried in Deer Isle, Maine, used in the original building façade, was also used for the new annex to maintain aesthetic continuity. Large, heavy slabs of granite were quarried, cut to shape in Canada, transported to New York — and then supported structurally by the DeSimone team.
6. Extensive collaboration between members of the project team proved critical to achieving the project vision — especially in planning and executing the construction sequencing, surveying, and detailed modeling — including DeSimone's structural engineers, OCI's steel fabricators and erectors, KCI McLaren's field engineers, and Turner serving as general contractor.



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