



This page Architects designed a terraced addition to join the second through fourth floors, creating connectivity between floors and a landscaped courtyard for new tenants.

200 Fifth Avenue



From the inside out, renovation of the Toy Center building gives new life to the landmarked icon.

SOMETIMES AN ICON OF THE PAST MUST UNDERGO A FACELIFT to become an icon of the future. This was the case for 200 Fifth Avenue, the landmarked former International Toy Center built in 1909 that for decades was the home to toy manufacturers and suppliers before becoming largely vacant in recent years. Owner L&L Holding Company knew that finding tenants for the upper floors of the building, with majestic views overlooking Madison Square Park at the corner of 23rd Street and Broadway, wouldn't be a challenge after some interior modernization. However, finding tenants to take the lower floors facing an interior court full of mechanical equipment would be much more difficult. Responding to this challenge, the firm hired Studios Architecture to undertake an ambitious renovation of the entire building, opening up its circulation and adding a 14-story curtain wall with dramatic views overlooking a newly configured courtyard in the building's center.

Studios, working with structural engineering firm Thornton Tomasetti, identified three improvements that would create Class A office space for the entire building. The first was to create larger and more functional elevator lobbies by renovating the building entrance and adding a 14-story lobby extension onto the eastern courtyard wall. The second was to create additional floor space on the second through fourth floors by filling in the western end of the courtyard with a terraced structure that would increase circulation, making a rectangle out of the U-shaped floors. The third objective was to flood both the eastern elevator lobbies and the western infill floors with natural light by building glass and aluminum curtain walls facing the newly infilled courtyard, transforming the new terrace into a tranquil, landscaped gathering space. All the improvements were carried out in structural steel because of its versatility.

Engineers had the advantage of working with the existing structure's robust steel columns. "As we began to analyze the building's structure, we found that the columns had a great deal of reserve capacity, which helped minimize the reinforcement necessary to accommodate the additional loads," says Gary Mancini, senior principal at Thornton Tomasetti. Although many of the building's original structural framing drawings were uncovered, they did not contain essential information on the connection details. Because the beam connections were encased in 18-inch terra cotta flat arch floor slabs, engineers performed nearly 100 probes throughout the undersides of the floors to measure and evaluate the connections.



This spread: Studios Architecture



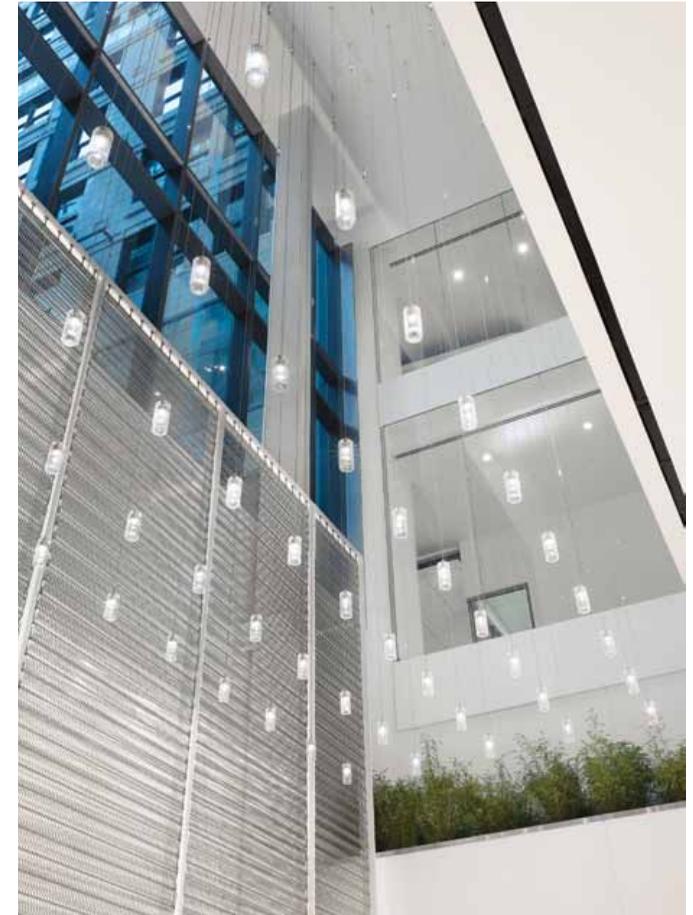
Top left Steel frames the new 14-story elevator lobby extension on the eastern courtyard wall.
Above left Column brackets at the north and south sides of the courtyard infill floors receive long-span W18 girders.



Top right The building's mechanical court before the renovation.
Above right The stepped west courtyard infill floors under construction.

“From a leasing standpoint, an attractive, exciting space on the second floor of a building isn’t always apparent.”

David Burns, Studios Architecture



Right The 14-story curtain wall extends to the lobby, bringing in natural light.

They found that the connections consisted of numerous variations of riveted seat configurations, stiffened and un-stiffened. Limitations in floor load capacity were driven primarily the beam connections, many of which required field-welded reinforcement or stiffening to strengthen the capacity in several areas where loads were increased.

“On the second, third, and fourth floors, the structure provided the connectivity that the tenants were going to be wanting,” says Studios principal David Burns. With a 40-by-60-foot courtyard as the focal point, architects were able to take advantage of larger existing floor-to-floor heights of 10 feet, 4 inches to create the hub of the building on the second and third floors. “From a leasing standpoint, an attractive, exciting space on the second floor of a building isn’t always apparent,” says Burns. “To really lease the building from the bottom up, we got clearspans across the courtyard so we didn’t have any columns.” Leased to advertising and marketing powerhouse Grey Group, the design gave the tenant the ability to accommodate the maximum number of people in its offices. “To have that big space at the center of their creative department, and the entire arrival sequence for the potential client in the event of a pitch, was important,” says Burns.

The 40-foot-wide, column-free courtyard infill was achieved with relatively shallow W18 girders, but because existing spandrel beams prevented access to the columns for conventional connections, the team designed custom seat connections that fit right beneath the spandrel beams. The new seats directly engage both sides of the column flanges and extend beyond the spandrel beams to support the new girders. “Our primary concern with this solution was the bending moments induced on the columns due to the large eccentricity of the seat connections and the major girder reactions,” says Mancini. “We worked closely with the steel detailer to develop a connection that was not only feasible for transferring the loads with minimal bending moment, but could also be readily implemented in the field.”

Structural support of the 14-story elevator lobby extension at the east side of courtyard, posed another challenge. The objective was to minimize the structural profile to achieve the architect’s vision of maximum clarity through the transparent new curtain wall. Because the second floor of the elevator lobby is open to the ground level, the vertical supports would need to span un-braced for nearly 30 feet, supporting the entire elevator lobby extension above. Ultimately, the aesthetic and structural goals were met with a pair of HSS20x8 A500

Clockwise from top: Studios Architecture; Studios Architecture; Thornton Tomasetti; Studios Architecture

Studios Architecture



Terra cotta louvers mark the separation between the landmark structure and the new 176-foot-tall curtain wall.

This spread: Studios Architecture

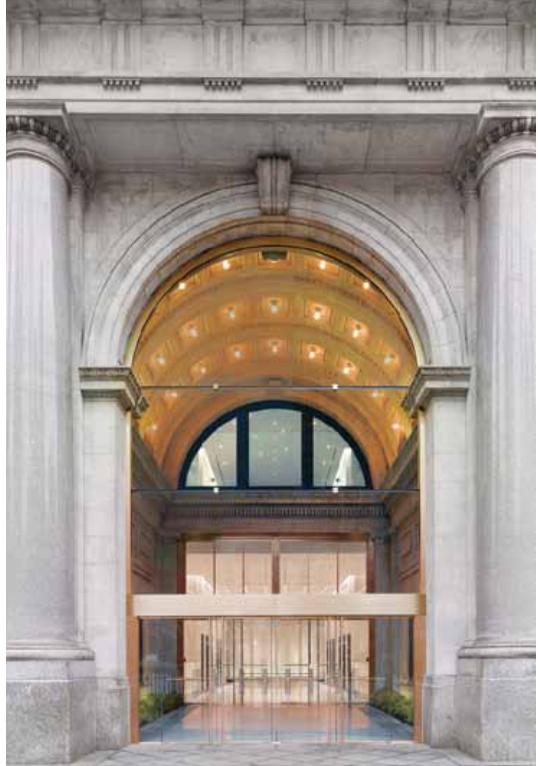
Grade B, Fy 46 ksi columns that transferred out to massive W18 girders at the ground level.

Concerns about the cost of installing a 14-story curtain wall system initially led the team to consider installing a window wall system. “Minimal differential in costs for this scale project and the improved visual appearance, enhanced performance and faster installation of unitized systems moved the project toward pre-tested, pre-engineered curtain wall systems,” Mancini says.

The courtyard’s new 178-foot, 14-story curtain wall on the east end is a four-sided structurally glazed aluminum mullion and glass unitized system, with 66-by-144-inch-high units anchored to the top of the structure at each floor. The exception is the lower two stories where the increased story heights required a stick-built system with reinforced vertical mullions. The clear 1-inch insulating glass has a PPG Solarban 60 low-e coating on the No. 2 face of the assembly, and spandrel areas are covered by clear 1-inch insulating glass with an insulated metal panel shadow box. Because of the higher story heights on the north and south courtyard walls, and on the “wedding cake” setbacks on the west side, a stick-built system using the same four-sided structurally glazed curtain wall panels was used at these locations.

The courtyard’s north and south setbacks, planted with sedum at the 8th and 12th floors, created a unique opportunity for the architects to juxtapose the old and new wall structures with 2-inch-square horizontal terra cotta louvers over the two vertical bays that infill the set-back areas, and over the 8-foot-high screen wall that juts above the roofline. “We’ve tried throughout the project to separate some of the old pieces from the new to create buffers, so it felt like a clear distinction and a respect for the existing structure,” says Burns. The use of multiple wall systems and green roof assemblies required the designers to pay particularly close attention to maintaining continuity of the thermal insulation, air and moisture barrier and transitions between new and existing wall systems.

While 200 Fifth Avenue’s internal changes are dramatic, L&L Holding knew that most who passed by would never see them, so they decided to update the ornate bronze entry to better reflect the sleek redesign of the building’s main lobby and interiors. Though the existing entry was not original to the building—it had been built with an open-air ground floor, like an arcade—any changes to the exterior still had to pass landmark approval. Studios collaborated with Thornton Tomasetti’s Building Skin experts to design an ultra-clear structure to complement the historic facade: three grand panels of anti-reflective, low-iron glass that span the width of the 16-foot arched doorway. The panels appear to float above the entrance, held in place at one-third points with bronze clamp supports, each a mere 3-by-3-inch square, attached to steel cables that are pre-stressed to a tension force of over 30,000 pounds in order to minimize deflection of the long-span glass panels under wind loads. To accommodate these huge forces, the building framing was reinforced at the cable support points behind historic limestone columns. Now, the ornate stonework of the vestibule and the newly sunlit lobby beyond are clearly visible, ensuring the building’s future will be just as bright as its past. ■



Glass supported by barely visible cables spans 200 Fifth Avenue’s new entrance.

200 FIFTH AVENUE

Location: **200 Fifth Avenue, New York, NY**
 Owner and Developer: **L&L Holding Company, New York, NY**
 Architect: **Studios Architecture, New York, NY**
 Structural Engineer: **Thornton Tomasetti, New York, NY**
 Mechanical Engineer: **FMC Associates, New York, NY**
 Project Manager: **Gardner & Theobald, New York, NY**
 Construction Manager: **Structure Tone Inc., New York, NY**
 Curtain Wall Consultant: **Thornton Tomasetti, New York, NY**
 Structural Steel Fabricator and Erector: **Empire City Iron Works, Long Island City, NY**
 Miscellaneous Iron Fabricator and Erector: **Transcontinental Contracting, Newark, NJ**
 Architectural and Ornamental Metal Fabricator and Erector: **A-Val Architectural Metal Corp., Mount Vernon, NY**
 Curtain Wall Erector: **Genetech Building Systems Inc., Staten Island, NY**