840 North Lake Shore Drive Tower Chicago, Illinois

Courtesy of James Steinkamp/Ballogg Photography. © 2005 James Steinkamp.

Some 560 architectural precast concrete panels and other precast components were used to adorn this 26-story residential building on Chicago's Near North Side overlooking Lake Michigan.

The new 26-story condominium building at 840 North Lake Shore Drive, overlooking Lake Michigan, is a handsome addition to Chicago's famous skyline. At 325 ft 6 in. (99 m) tall, this attractive residential building adds class and complements the other distinctive buildings in its vicinity. The distinguishing feature of this building is its rich architectural precast concrete cladding, with emphasis on a stone-like appearance.

To accomplish this task, the owner, LR Development Company, commissioned Lucien Lagrange Architects, a firm renowned for its expertise in designing architecturally attractive high-rise buildings, to design the structure. Because it would have been prohibitively expensive to clad the building entirely with natural stone, the architect selected precast concrete as the predominant cladding material. Thus, for economic reasons, only the facade of the first two floors were clad with natural French limestone panels.

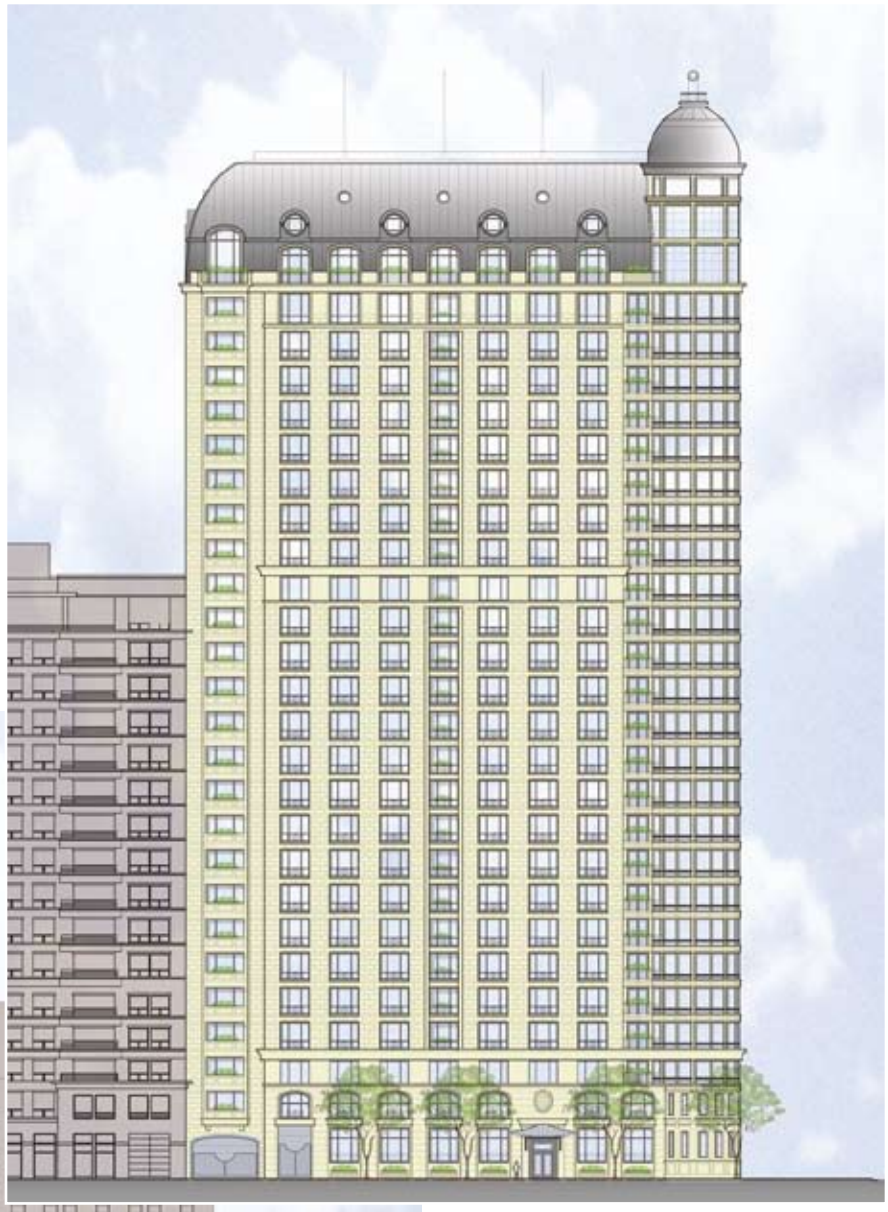
It turned out that precast concrete, with its own unique characteristics and

high quality, provided an equivalence to stone. One major advantage of precast concrete is that it can be molded into almost any shape and be given nearly any color.

The engineer of record, Thornton-Tomasetti Engineers, was responsible for the structural analysis and design of the building. The skeleton of the building was reinforced concrete with a beam-column-slab framing. The building's cladding was designed for a 127 mile per hour (203 km/hr) lateral wind load.

The building contract was awarded to James McHugh Construction Company, the general contractor.

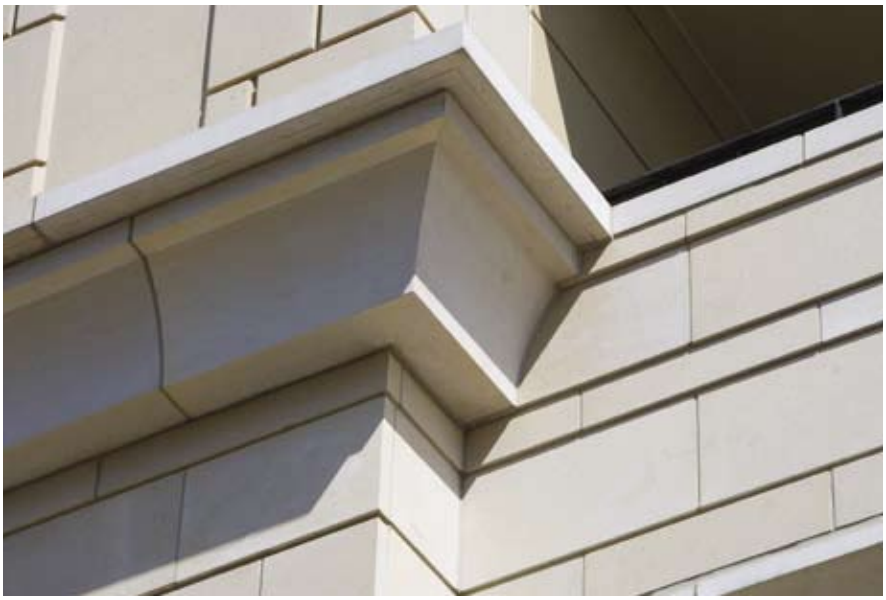
The total square footage of the building is 368,010 gross enclosed sq ft (34,200 m^2).



About 560 precast concrete components were used to clad the building, the majority of which were window unit panels. The facade also included spandrels, cornices, and other ornamental pieces.

A typical panel on the south elevation is 23 ft 3 in. long and 10 ft 8 in. high (7.10 × 3.28 m). Panels are 7 in. (148 mm) thick with 11 in. (279 mm) returns at the windows.

The compatibility of precast concrete appears seamless in integration with the articulation and color of the building's natural stone base. Contributing to the residential character of the building, relief work in the precast cladding added both depth and definition to exterior surfaces through deep precast window returns and elegant

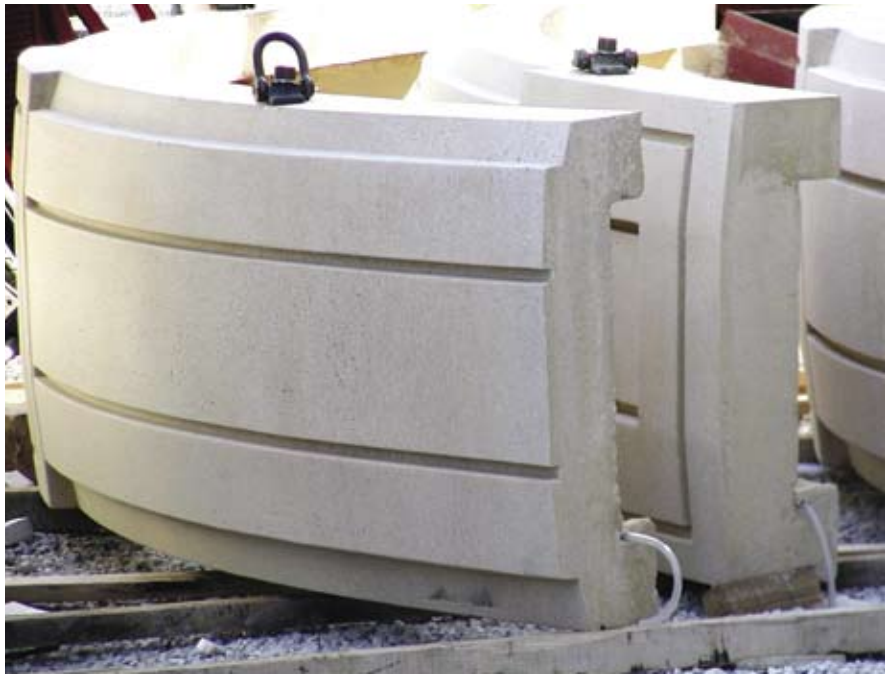


Courtesy of Lucien Lagrange Architects

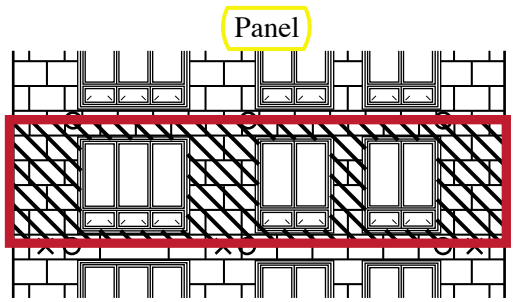
precast cornices. Also factoring into the building's elegant style is the turning of the corner with the radius rotunda's precast spandrel panels.

The project's goal was to achieve the appearance of an all-stone clad building. The following precast advantages were found to be crucial to the success of the project:

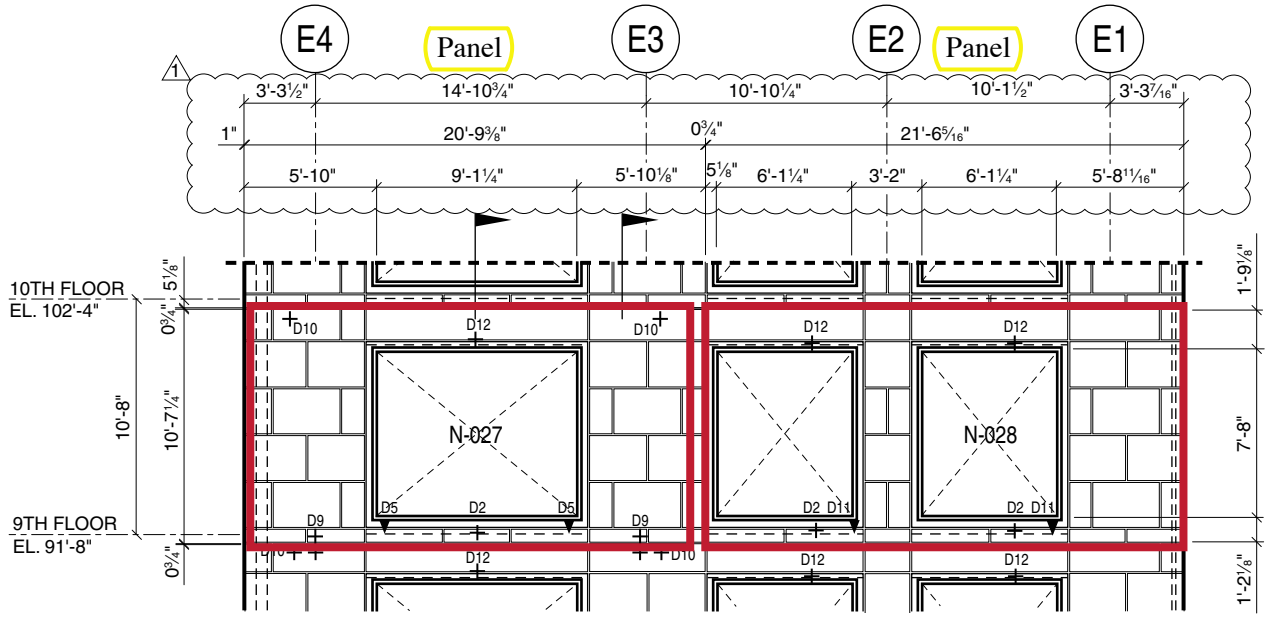
- Time and cost savings — Cladding a tower of this size entirely in natural stone would have been cost prohibitive. Stone quarrying, fabrication process, and transportation logistics alone would have significantly impacted the project's schedule and budget. Compounding this, cladding the tower in stone would have exceeded the capacity of any one source for erection, again affecting the schedule and budget.
- Architectural detailing — The building's deep punched-window expressions, jointing, and cornice line details were all possible because precast concrete readily lends itself to these architectural elements without creating prohibitively costly penalties. Also taking advantage of precast concrete's fluidity is the elegantly curved rotunda transition at the building's most prominent corner. Based on these considerations, the architect decided to limit the use of the French limestone and granite to the base and segue to precast concrete at the third floor.
- Consistency, quality, and compatibility — To achieve a flawless blend between the tower's limestone base and the precast concrete on the upper floors, the architect and precaster coordinated closely to produce cladding with a warm buff color and a light sandblast texture, simulating the limestone color and finish. Close attention to panel configurations and discrete panel joint locations by the collaboration between the architect and precaster achieved the goal of an all-stone facade appearance. Communicating the importance of consistency in color and texture, the architect visited the precasting plant, where full-sized mockups verified the compatibility of all facade components — including windows, ornamental railings, and sealants, as well as precast pieces — in color, detail, and fit. This dedication to quality control continued throughout the entire precasting operation.
- Staging and installation — As an added advantage, the use of precast concrete minimized both construction time and, important on this tight urban site, the staging area required for installation. The precaster scheduled timely deliveries, allowing the construction crew to unload and hoist panels with a tower crane, without having to stockpile precast components on site. Window installation also benefited from the choice of precast concrete. While windows would have required a metal strongback system to attach the stone to the building frame, in the case of the precast panels they could easily be installed, thus speeding enclosure of the tower.



Courtesy of Lucien Lagrange Architects

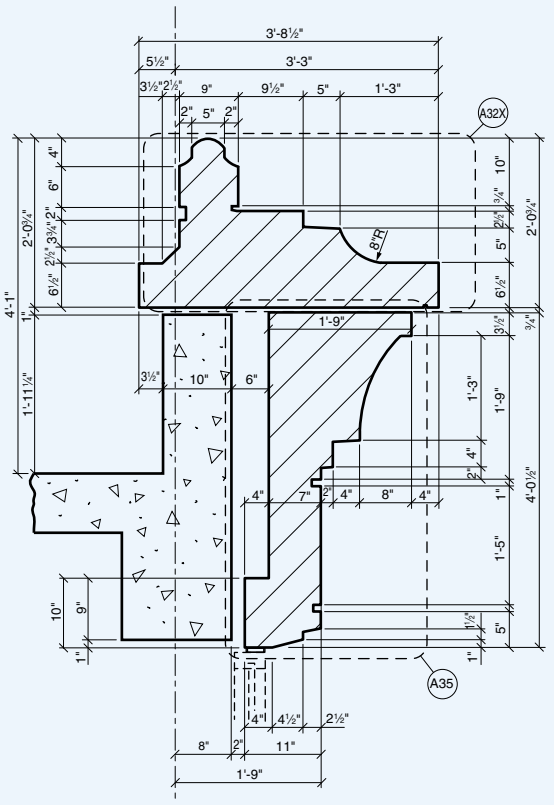


Architect's Proposed Panel Concept (East Elevation)

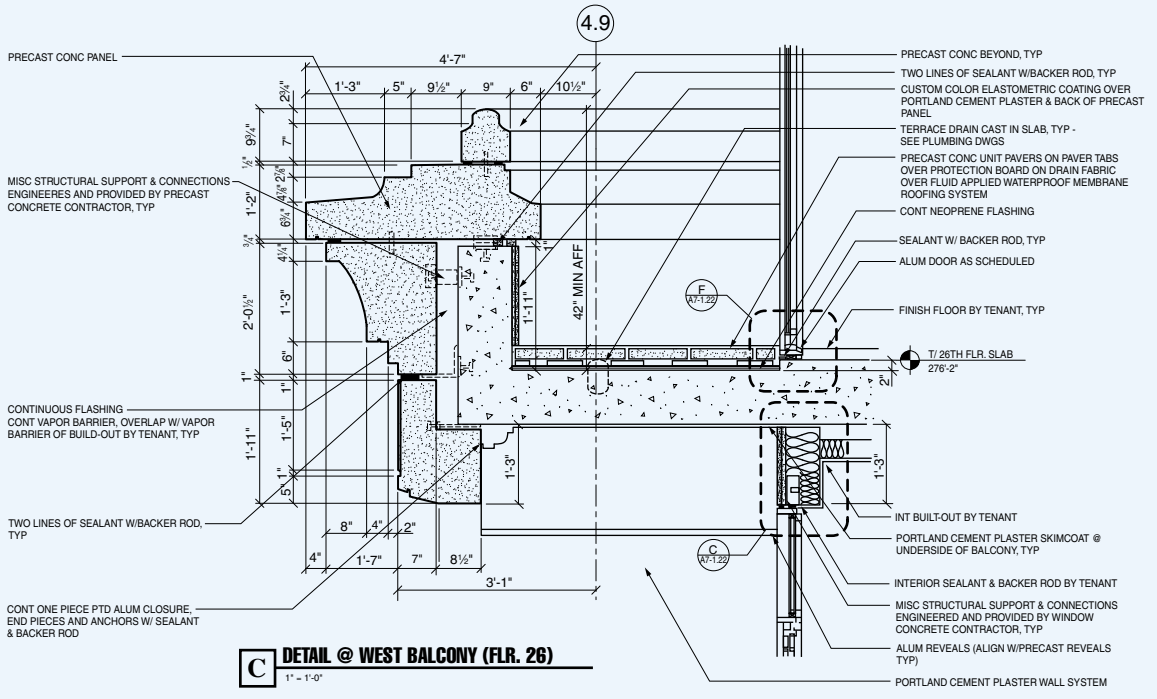


Precaster's Fabrication Panels (East Elevation)

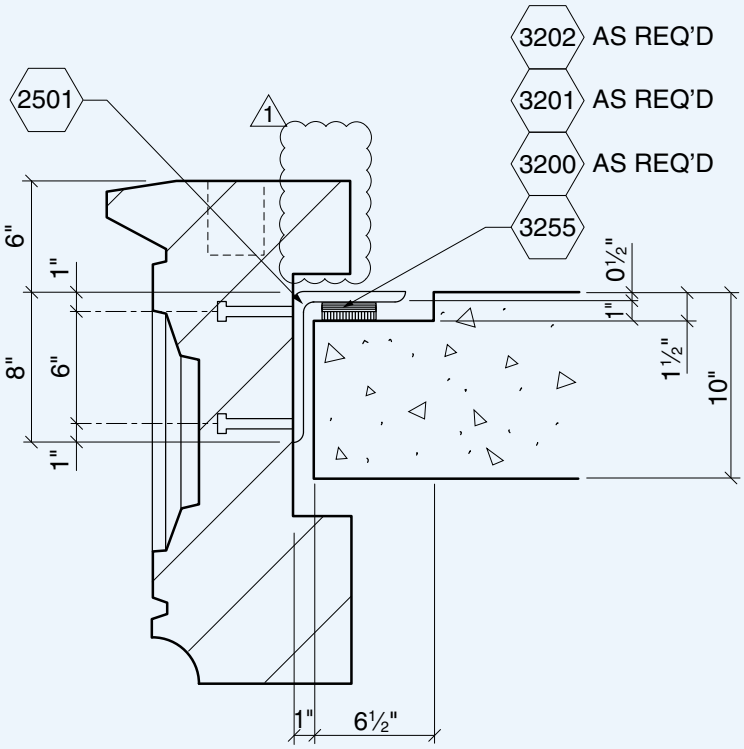
Courtesy of James SteinkampBallogg Photography © 2005 James Steinkamp.



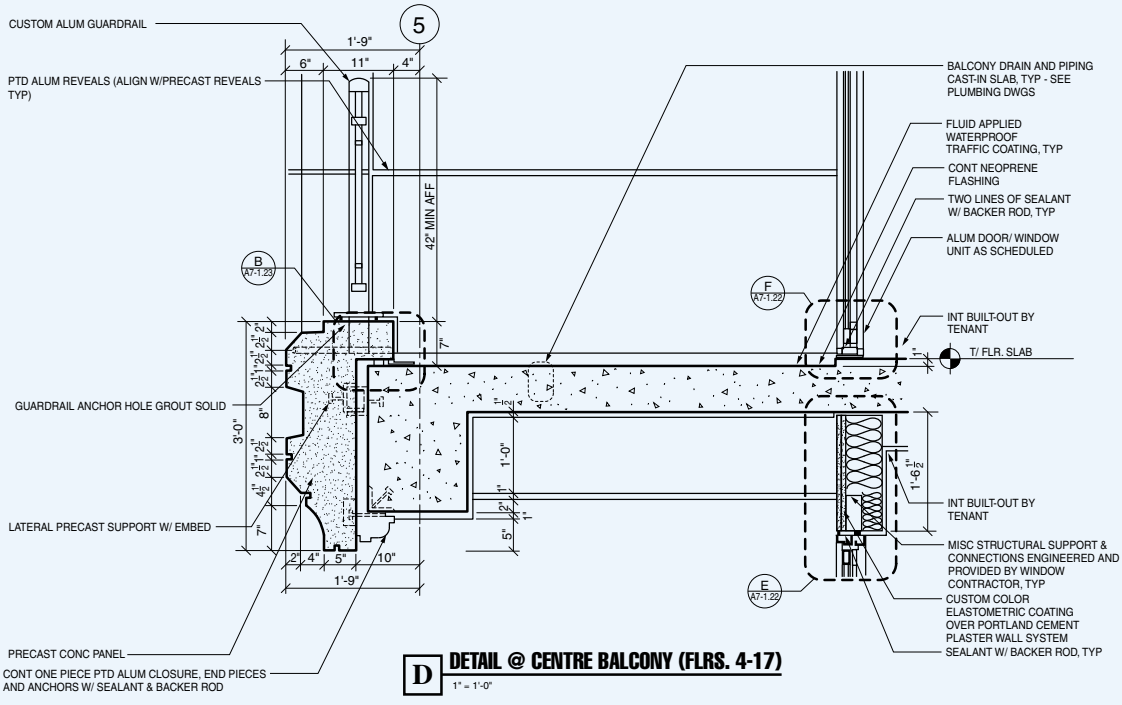
Precaster's Fabrication Detail



Architect's Design Detail



Precaster's Fabrication Detail



D DETAIL @ CENTRE BALCONY (FLRS. 4-17)
1" = 1'-0"

Architect's Design Detail

Courtesy of Lucien Lagrange Architects

Courtesy of Lucien Lagrange Architects

The precast concrete components were manufactured by Gate Precast Company at their plant in Winchester, Kentucky. They were shipped by truck-trailer to the project site — a distance of about 380 miles (616 km). Gate Precast was responsible for both the transportation and erection of the precast components.

Computerized Structural Design of Milwaukee, Wisconsin, served as the precast specialty engineer on the project. In addition to suggesting several cost-saving ideas on detailing and other items, they produced the shop drawings for the precast portion of this job.

Design of the building began in November 2000. While the reinforced concrete frame was going up, the precast concrete components were being fabricated at Gate Precast. Erection of the precast components took place in 2003 and the building was substantially completed by April 2004. Residents started moving into the building during the summer of 2004.

The total cost of the project was $37,786,000.

The cost of the precast package was $2,970,000.

In a city renowned for its architectural heritage, this distinctive 26-story condominium tower, rising from a prominent lakefront site, is a welcome addition to the Chicago skyline. Architectural precast concrete cladding emulates the natural French limestone at its base, and with it, creates the building's stone pattern, succeeding aesthetically in color and texture. Use of this product supports the economic viability of the Near North Side of Chicago, and complements the rich, vintage, high-rise residential history along the lakefront.

The 840 North Lake Shore Drive tower has already received many accolades from the design community and Chicago public. Earlier this year, the project was a winner in the "Best Multifamily Building" category of the 2005 PCI Design Awards Program. The jury comments were as follows:

"This project is an extremely good example of emulated limestone and demonstrates precast concrete's versatility and ability to be molded to nearly any shape, such as with the curved and slender design around the rotunda area. The precast panels have a very high quality of finish and elegant detailing. This is a very good example of what one can do when inspired."

CREDITS

Owner: LR Development Company, Chicago, Illinois

Architect of Record: Lucien Lagrange Architects, Chicago, Illinois

Engineer of Record: Thornton-Tomasetti Engineers, Chicago, Illinois

General Contractor: James McHugh Construction Company, Chicago, Illinois

Precaster: Gate Precast Company, Winchester, Kentucky

Precast Specialty Engineer: Computerized Structural Design, Milwaukee, Wisconsin

Photographs courtesy of Steinkamp/Ballogg Photography.

[GDN]