

Extraordinary Crane Capacity Speeds Queens Building

When First Nationwide Bank agreed to become a prime tenant in the now-building Kew Gardens Office Tower in Queens, the contract provided that the space be available for occupancy 12 months thereafter. Normally, constructing such a building takes 18 to 24 months, so fast-tracking would be required. Steel erection would have to be completed in three months. This fast a schedule demanded exceptional planning and selection of crane equipment for the 12-story, 230,000-sq.-ft. tower.

The options were fixed tower cranes, truck tower cranes and guy derricks.

One of the factors which would affect the choice of hoisting equipment was the incorporation of 220,000 sq. ft. of underground parking on three levels, which would occupy the entire site. These parking decks, which will provide space for 274 cars, were considered an essential amenity for the tenants of what was going to be a top-class office building, and one of the first in central Queens to offer this convenience. Indeed, fully half of the total tonnage of steel for the project is used to frame the parking decks and the plaza area over them, around the building.

Truck tower cranes were rejected, recalled Mitchell Solomon of co-construction manager HRH Construction Corp., because each would weigh 250 tons, so a stronger and more costly steel structure would have been needed to support the at-grade plaza deck and underground parking structure. Truck tower cranes could not be stationed outside the property, because busy streets bound three sides of the site, and a building abuts the back property line.

Guy derricks could have erected the steel, but they work more slowly, according to John Egyed of steel erector Falcon Steel Co., due to guy interference. They would have had to be

jumped each time erection progressed two floors, and doing that would lose a day each time.

The ideal crane equipment was conceived to be two fixed tower cranes, supported on concrete foundations within the site at locations where they would interfere only minimally with the sub-plaza parking structure. Each foundation interfered with only one beam at each subgrade level. A truck crane was set up on an earthen ramp within the site, left in place during foundation excavation, and was used to erect a FAVCO

The structural steel frame delivered what concrete could not: Greater open floor spans at lower cost and with the desired floor-to-floor height.

750 at the back of the tower, near the building which abuts the rear property line. An FMC 1500 was erected at the front of the tower, near the street, by a truck crane on the street. A single tower crane could not have reached the entire, 200-ft.-wide site, Mr. Egyed said. And, of course, two cranes could erect the

steel twice as fast, to meet the construction schedule.

"This job was 'made' for the erector," Mr. Egyed reported, "by the fact that the 1500 could dismantle the 750 after steel erection was completed, since there was no access at the back of the tower for a truck crane to get near the 750." The 1500 was then dismantled by a 200-ton mobile truck crane set up on the street at the front of the site.

For framing the building, steel was chosen over concrete because the super-structure would cost less, as would the foundations due to a steel structure's lighter weight, according to principal Eli Dubinsky, of Dubinsky Consulting Structural Engineers. He said that the tower's 35 ft. to 50 ft. spans are far too great to permit use of flat-plate concrete floors. A concrete structure would have needed beams or a waffle structure, and that would have meant a much more costly frame than could be built with structural steel. Additionally, the floor-to-floor heights would have been considerably greater than with steel. The steel structure's floor-to-floor height is 12'-9", and the floor-ceiling sandwich is 42 inches deep.

An economical design of less than 14 lbs. of steel per sq. ft. of floor area, including wind frames as well as pick-up trusses and transfer frames, was achieved by computer optimization, Mr. Dubinsky said.

The building site is one of the most desirable in Queens. Located in the borough's civic center near Borough Hall and the Queens County Courthouse, it is at the intersection of three major highways—Grand Central Parkway, Queens Boulevard and Interborough Parkway. And it is across the street from a subway station on the E and F lines leading to Manhattan, and five blocks from a Long Island Railroad station.



12-story superstructure steel and 3 levels of steel below grade were erected quickly through careful planning and crane equipment selection

Photo Credit: Delilah McKavish

The site is atop a rise in the terrain, so the new building would be visible from afar. The building has a diamond-shaped plan that enables the building to present major facades to all surrounding roadways, explained Brian Principe, partner-in-charge of the project for Eli Attia Architects, the design architects.

With its crystalline shape, and like a crystal, the building's six facade planes are smooth. That is, except above the main entrance, which is at the intersection of two facade planes, and which is dramatized by sculpted facets reminiscent of those in a rock crystal, and by use of glass of different colors and surface treatments mounted on an aluminum curtainwall. Clear glass is used around the entrance, gray tinted glass over most of the building facade, and between the two, silver reflective glass.

The architect's specifications called for the major portion of the glass to be mechanically fastened to the aluminum mullions and the balance to have structural silicone adhesive on the two vertical edges of each piece of glass. Instead, structural adhesive is being used on all four edges.

Mr. Principe said this four-sided structural adhesive has two benefits: It speeds fabrication, and makes the completed curtainwall more leakproof. Mr. Solomon said "the four-sided structural adhesive leads to a tremendous reduction in likelihood of leaks, giving nearly 100% assurance there will be none." According to William Cheer of curtainwall fabricator Wallace Crossly Corp., there is a third benefit: The thermal-insulation performance of windows glazed solely with structural adhesive is better than that of mechanically fastened ones.

If the structural adhesive had been eliminated, and the glass secured solely mechanically, the first cost would have been less, Mr. Cheer conceded. But "in that case if you consider the cost of

repairing the larger number of leaks the building would have suffered over its life, the life-cycle cost would have been higher than it will be as built, with the structural adhesive." The curtainwall is being prefabricated in modules each 12'-9" or one floor high, and 4'-11" wide.

The building, whose first tenant is scheduled to move in this year, is one fruit of New York City's push to encourage relocation of businesses from Manhattan to the outer boroughs, rather than having them move to the suburbs. As such, it will be watched with great interest.

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KEW GARDENS OFFICE TOWER

Developer: 80-02 Leasehold Company, Queens

Design Architect: Eli Attia Architects, Manhattan

Production Architect: Wechsler Grasso Manziuso, P.C., Manhattan

Construction Managers: Geller Development Corp., Lake Success, N.Y., and HRH Construction Corp., Manhattan

Structural Engineer: Dubinsky Consulting Structural Engineers, P.C., Manhattan

Structural Steel Fabricator: Lehigh Structural Steel Co., Allentown, Pa.

Structural Steel and Metal Deck Erector: Falcon Steel Co., Inc., Wilmington, Del.

Steel Detailer: Westgate Drafting Service, Inc., Pittsburgh, Pa.

Curtainwall Fabricator: Wallace Crossly Corp., Miami, Fla.

Curtainwall Erector: Hi-Tech Erectors, Staten Island, N.Y.

Steel Stairs: A. Perlman Iron Works Inc., New Rochelle, N.Y.

Square Footage: 230,000 for offices; 220,000 for underground parking

Steel tonnage: 3,200

Type of Steel: A572 Grade 50

Total Curtainwall Area: 100,000 sq. ft.

Curtainwall Material: Aluminum and glass, with black Duracron interior finish on mullions; and vertical and horizontal exterior aluminum accent strips with Kynar 500 coating, alternating black, white and gray



Kew Gardens Office Tower has a diamond or crystalline shape

*Photo Credit: Michael Zenreich/ Eli Attia Architects
Modelmaker: James Wallace*