BEST OF 2007 AWARDS

NY Times Tower Newest "Jewel" of NYC Skyline

BEST OF 2007 - Project of the Year

When the New York Times partnered with Forest City Ratner Cos. seven years ago to consolidate its offices under one roof, Times Square has already cleaned up its sullied image. But for a city with one of the world's most celebrated skylines, New York at that time has not seen a groundbreaking skyscraper for decades while all over Europe, Asia, and the Middle East celebrated architects put up new wonders of the world.

In came Italy's Pritzker Prize-winning architect Renzo Piano. Together with New York's FXFOWLE Architects, Piano suggested a 52-story tower, topped with a 394-ft mast, a building so light that it "defies gravity" and physically represents the image of transparency the paper wanted to project.

To achieve it, the team proposed to expose the shell's steel beams rising the entire height and clad all four sides in a high-transparency glass, rather than the reflective or tinted norm in Manhattan. A series of ceramic rods would run horizontally in front of the windows and extend 92 feet above the roof to reflect different colors depending on the weather and time of day, while deflecting some of the light from overheating the interior. These elements have never been seen in New York on such a scale – and brought a slew of constraints with them from design to construction.

"This project was just a jewel," said one member of the jury who voted for the New York Times Tower as the year's top project. "Top to bottom, it was well done."

The steel exoskeleton required careful engineering to ensure that the growth of

the steel from season to season, estimated to be as high as four in. over the building's 748-ft height, would not crack the floors. New York's Thornton Tomasetti, the structural engineer on the project, went through three or four iterations when studying options instead of the usual one or two, according to Tom Scarangello, managing principal of the firm. X-braces made of steel rods support each corner notch, and a thermal belt truss at the 51st floor pins the exterior steel to the interior and minimizes the differences in length caused by thermal variations. The steel tapers from four in. at the base to two in. at the top on the exposed flange, and from eight- to one-in. web thickness, to physically lighten the building.

"Because the owners took the time to work out the details, there weren't a lot of things that challenged our assumptions," says Scarangello. "The challenge was really the construction environment."

Since all the exterior steel was exposed, even minute details became crucial, aesthetically. Unlike in standard steel erection, where connections are covered up with fireproofing and drywall, the choice and placement of literally each bolt had to be uniform. In addition to educating the site crew, Piano's office assigned Serge Drouin, one of the designers, to monitor the steel work on a daily basis. "Serge ingratiated himself with the steel erectors – not a group of people you would expect to work as closely with an architect," says Scarangello. "But he helped them instill pride in the way the steel went up."

But no one could predict that the $850 million project's steel fabricator, Interstate Iron Works of Whitehouse, N.J., would go out of business in 2004, with its owner blaming skyrocketing steel prices and a tight pre-negotiated contract. The departure forced the construction manager, New York-based AMEC Construction Management, to effectively enter a new field and become the steel supplier for the project.

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Prior to this, however, the team had to compensate for other delays in the schedule. The attacks of September 11th delayed the final designs, while soil contamination discovered only during the excavation and demolition stage in 2004 delayed excavation by eight months. In addition, while initial borings showed 40- and 20-ton rock and thus required spread footing for the tower, additional borings showed a seam of weak rock and the design had to be altered to place about a third of the tower columns on 22-in drilled caissons. The team, however, reversed the construction sequence and started with the tower on the west side of the site instead of the four-story base building on the east side, while AMEC accelerated shop drawing submissions and fabrication orders, reversing the delay and starting construction two months ahead of schedule.

The steel component continued to present problems. In July 2005, faced with an expiring contract, steel workers went on strike, halting construction for days. Despite it, the building was delivered on >>

time for a grand opening this July.

The combination of exposed steel and a curtain wall made of 9,600 individual units, 1,150 of them unique, opened up the building to 840 violations of the envelope that made it susceptible to air and water infiltration. To compensate, the crews installed silicone boots at the beam penetrations and put in each unit first without the head rail, spandrel glass, and back pan. Since the glass was extremely transparent low-iron Starphire glass, fabricated by Viracon of Owatonna, Minn., and low-e VE-2M coating, it left the interior of the 1.54-million-sq-ft building vulnerable to glare and heat gain. To avoid high air cooling costs, the team first added 185,000 ceramic tubes manufactured by Germany-based Haldenwangere to dissipate the light, while a three-and-a-half-ft-high "vision panel" integrated into the gridwork on each occupied floor will open up the interior to the panorama outside. Sensor-controlled solar shades inside the building would then automatically adjust to various angles of the sun throughout the day and different seasons. The team built a 4,500-sq.-ft. mockup of the system and measured natural light from solstice to solstice using 100 real-time sensors to make sure it was adequate on the entire 650,000-sq-ft facade.

One additional constraint hung over the AMEC crew: the AMEC conglomerate started diversifying out of the construction management business during the project to come back to its core consulting and engineering practices.

"This team survived a challenging project – not just in design and construction, but due to the default of the steel contractor – at the same time as the company dissolved around us," says Patrick Muldoon, AMEC's senior project executive. "They didn't have the support you usually have in a large firm, and the fact that this team got through this on its own is a major accomplishment."

The Times, which would occupy the first through the 28th floors, was the end user so the building had to be energy independent in order for the paper to put out the news no matter the emergency. New York's Flack & Kurtz, the MEP engineer on the project, added a 1.4-Mw cogeneration plant capable of powering the paper's mission-critical operations while generating 250 tons of cooling from waste heat. In addition, although the team >>

Key Players

Owners: The New York Times Co. and Forest City Ratner Cos., New York

Architects: Renzo Piano Building Workshop, Italy, and FXFOWLE Architect, New York

Construction Manager, Core and Shell: AMEC, New York

Interiors Architect, New York Times: Gensler, New York

CM on New York Times Interior: Turner Construction, New York

Structural Engineer: Thornton Tomasetti, New York

MEP Engineer: Flack & Kurtz, New York

Exterior Wall Consultant: Heitmann & Associates, Chesterfield, MO

Civil Engineer/Transit Authority Consultant: Vollmer Asociates, New York

Geotechnical Engineer: Mueser Rutledge Consulting Engineers, New York

opted not to pursue LEED certification due to additional costs and oversight it would require, energy efficiency to save on operational costs was a key goal, as was a healthy productive environment for all of its 2,500 employees. To that end, Flack & Kurtz designed a raised floor in the 800,000-sq-ft Times portion of the building for the HVAC components, instead of a dropped ceiling, as is standard in Manhattan. (FCRC opted to let individual tenants choose their own systems in its 600,000 sq ft of office space on floors 29 through 50). The system allows for ultra-efficient underfloor displacement air circulation, which allows cold air to rise on its own and concentrates controlled air temperature only in the lower 60 % of the space, where it's needed, instead of the whole height. Combined with the "intelligent building control" system, the HVAC needs of the building are reduced, while integration with sun shades can further reduce thermal needs by up to 25 % in case of emergency, according to Dan Nall, director of advanced technologies for Flack & Kurtz.

The tower also features state-of-the-art gearless elevators capable not only of moving at 1600 per minute but incorporate a dispatch system that inputs passenger destination in the lobby and reduces the number of stops.

In addition to creating light-filled offices for the Times' staff and FCRC tenants, Piano's design extended transparency to the pedestrian level. On the first floor, 20,000 sq ft are reserved for retail, while the east side's four-story base that extends away from the tower includes a ground-floor 70-sq-ft open-air public garden of moss and birches, encased in glass and visible from the street. Adjacent to that is a glass-enclosed 350-seat auditorium, also visible from the exterior, available to non-profit and civic groups 104 nights of the year. Finally, in an effort to improve the ambiance around the Port Authority Bus Terminal on the opposite side of 9th Ave., the building is set back 17 ft from the building line to create more public space.

"I think what the Times has done is made developers realize that their customers want highly regarded architectural spaces where they're going to do business," says Muldoon. "There's a demand for that kind of quality space and [the developers] will get the rents to justify the expense." <<