



8 Spruce Street

Frank Gehry's new shimmering stainless steel facade makes waves in downtown Manhattan.

THEY'RE CALLING IT "NEWYORK BY GEHRY." A COLLISION OF Manhattan's famously vertical cityscape and Frank Gehry's equally famous geometries, 8 Spruce Street lives up to the billing. At 867 feet (one foot higher than Trump World Tower) with 76 total stories, it's New York City's tallest residential tower, and undeniably its most distinctive.

That distinction is mostly owing to the Gehry-designed facade, an undulating mass of 16-gauge 316L stainless steel with an angel hair finish that suggests a silky fabric draped over the building's T-shaped footprint. Inspired by the so-called "hard folds" in the work of Baroque sculptor Gianlorenzo Bernini, which Gehry contrasts with the "soft folds" of Michelangelo, the facade presents a surface that is both sharply angular and whimsically organic—a uniquely post-modern synthesis of monolith and mischief. This play of forms, stretching 319,000 square feet up and across seven sides of the eight-sided structure, is brought into stark contrast by the south face of the building, which is flat. Gehry designed the south face to lend 8 Spruce Street a sense of drama, creating a rare geometric juxtaposition of exuberance and restraint.

The architectural bluster rises for 70 stories, but rests on an unassuming six-story masonry pedestal, the future home of a public elementary school and additional offices for nearby New York Downtown Hospital. The masonry construction integrates the building with its surroundings: a cluster of turn-of-the-century Beaux Arts structures, the hospital, and the campus of Pace University. For all its formal gusto, 8 Spruce Street is firmly grounded in function. The high-art facade was inspired by Gehry's appreciation for the bay window, a design element that gives one the sensation of "walking out into space," he says. As much as a bay window looking out over New York City might appeal to potential renters, the all-unique floor plans promise to make the building one of the most coveted residential addresses in Manhattan. These not-a-one-like-the-other floor plans are created by

David Sundberg/Esto

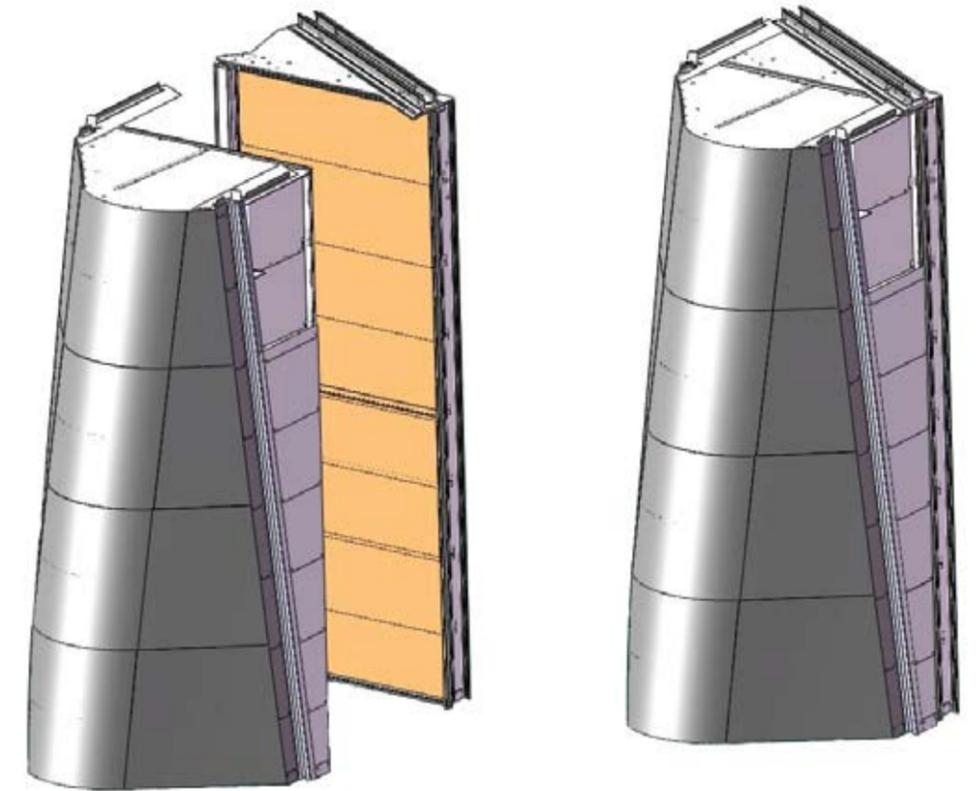
a structural slab system that traces the folds of the facade.

Developed by Forest City Ratner companies, 8 Spruce Street was slated to be a Gehry building from the start. Other members of the design and construction team included internationally accomplished structural engineers WSP Cantor Seinuk, New York construction management stalwarts Kreisler Borg Florman (KBF), and game-changing curtain wall fabricators Permasteelisa North America, all of whom played crucial roles in the design-assist phase. An estimated 10,000 hours of engineering and weekly design meetings went into developing a scheme that would adhere to the architect's vision while restraining the costs usually associated with such grand built gestures.

The KBF-managed construction process went as smoothly as any major Manhattan project in years. That the project reportedly produced less than 100 RFIs is a testament to the exacting work of the team as a whole and to that of KBF specifically. Surprisingly enough, representatives from KBF stated that the greatest coordination challenge between the design and construction teams was ensuring that the 14,000 embedded aluminum brackets used to attach the curtain wall to the slab edge were properly spaced. Improperly spaced brackets would create a significant lag in the wall's erection.

Frequent collaborators with Gehry Partners, Permasteelisa was key to the curtain wall design. Parent company Permasteelisa International has been working with Gehry since 1992, when his "El Pez" debuted at the Barcelona Olympics. More recently, Permasteelisa NA fabricated the stainless steel shapes for Gehry Partner's Walt Disney Concert Hall in Los Angeles. Permasteelisa representatives called working with Gehry an easy process, streamlined by the long-time familiarity of both parties.

Permasteelisa used several software platforms in completing the design: CATIA, a 3D modeling program widely used in the automotive and aerospace industries and appropriated by Gehry decades ago to realize his unorthodox undulating shapes, was employed for surfacing; SolidWorks was used for all-important parametric modeling; and AutoCAD for submission to the architects at Gehry Partners.



Construction of shaped column unit with stainless steel panel rainscreen.



Above Curtain wall erectors install 9-foot-10-inch-tall curtain wall sections ranging in width from 3½ to 5½ feet high above lower Manhattan.
Left Each of the building's 70 stories was enclosed in four to five working days.
Opening page The undulating facade of 16-gauge 316L stainless steel was inspired by the hard folds in work by the Baroque sculptor Gianlorenzo Bernini.

In order to translate Gehry's complex geometries into sections that could be fabricated on a scale commensurate with a 70-story tower, the design-assist team established a number of guidelines, allowing them to tweak the design within established parameters. Each section would consist of a ruled surface, eliminating the compound curvatures that complicated fabrication. Rain screen panels can curve out as much as 6 feet or as little as 6 inches. Additionally, all of the 2,400 glazed panels would be normal, or perpendicular, to the ground plane and rectangular in shape.

The stainless steel shapes that would make up the rain screen were fabricated according to their radii. Soft radii sections were cold-formed and moderate radii sections were passed through a pyramidal roller and then cold-formed, leaving the tightest radii sections to be formed by cyclonic rollers. The curtain wall connections were generally conventional. In the case of tight radii sections meeting along the curtain wall, cap features were used. Permasteelisa refers to these as knife's-edge connections.

To reduce the cost of erecting a curtain wall in the cheek-by-jowl built environment of Downtown Manhattan, the team opted for a unitized curtain wall system over one that was stick-framed, a choice growing in popularity for residential tower construction. Fabricated at Permasteelisa NA facilities scattered across the continent from Montreal to Miami and at the firm's headquarters in Windsor,

Connecticut, 9-foot-10-inch-tall curtain wall sections ranging in width from 3½ to 5½ feet came off the line ready to install, reducing the cost of on-site staging.

A typical air-and-water barrier is positioned behind the expressive steel, which serves as the building's rain screen. The steel's angel hair finish, achieved with machinery that etches the surface with a fine pattern, will diffuse light and prevent glare on the facade. In the shop, these sheets were riveted to aluminum rain screen sub-frames, then attached to flat unitized curtain wall panels. More than 10,900 rectangular panels were manufactured for the 427,743-square-foot tower, but only 1,888 are exactly alike. All panels have interlocking male-female mullions and a mating horizontal stack. The assemblies account for the building's staggered floor plates, which are also all different, with stack joints that can shift in plane depending on the floor. Each floor plate was enclosed in four to five days.

Crucially, the head-turning facade did not exceed the estimated cost for a basic facade of the same scope and material. Forest City Ratner, Gehry Partners, Permasteelisa North America, WSP Cantor Seinuk, and Kreisler Borg Florman proved that a combination of skillful and efficient design-assist work pre-construction and crystal-clear coordination between all project participants can produce architecture that is cost-efficient, utilitarian, but also allows for aesthetic risk-taking. It's the meeting of no-nonsense and no-limits—it's New York by Gehry.

This spread: Permasteelisa



Facing The city's tallest residential tower rises above its downtown Manhattan surroundings.

Above Of more than 10,900 rectangular panels manufactured for the 427,743-square-foot tower, less than 2,000 are exactly alike.

The head-turning facade did not exceed the estimated cost for a basic facade of the same scope and material.

8 SPRUCE STREET

Location: **8 Spruce Street, New York, NY**
Developer: **Forest City Ratner Companies, Brooklyn, NY**
Architect: **Gehry Partners, Los Angeles, CA**
Structural Engineer: **WSP Cantor Seinuk Group, New York, NY**
Mechanical Engineer: **Jaros Baum & Bolles Consulting Engineers, New York, NY**
Construction Manager: **Kreisler Borg Florman, Scarsdale, NY**
Curtain Wall Consultant: **Gehry Technologies, Los Angeles, CA**
Curtain Wall Fabricator: **Permasteelisa North America, Windsor, CT**
Curtain Wall Erector: **Tower Installation LLC, Windsor, CT**
Curtain Wall Stud Erector: **AC Associates, Lyndhurst, NJ**