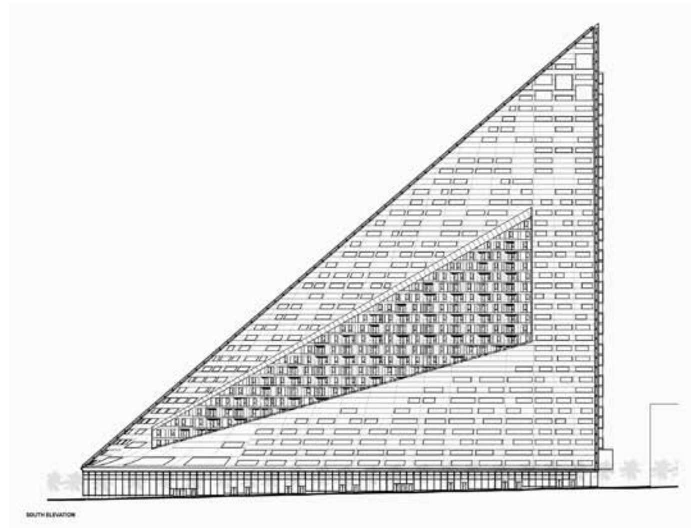
The south façade of Via 57 West features alternating San Francisco-style bay windows and nested balconies for every apartment.



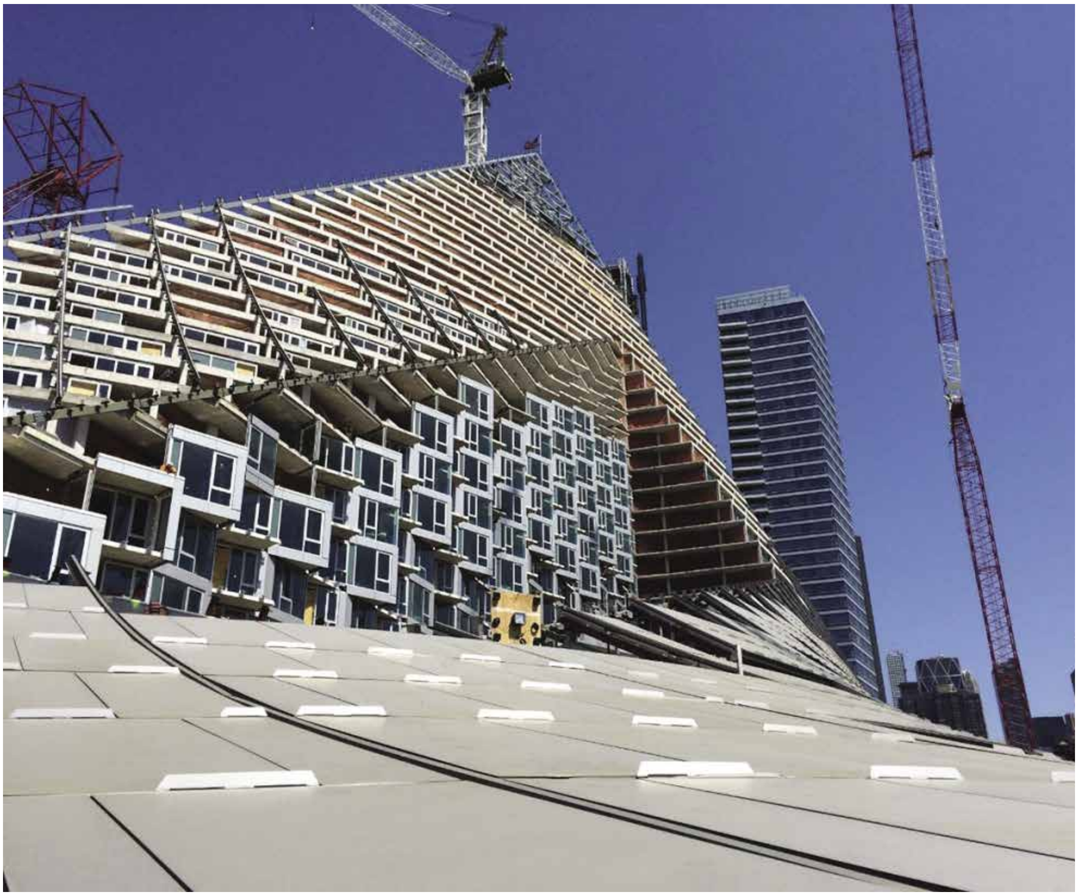
Via 57 West

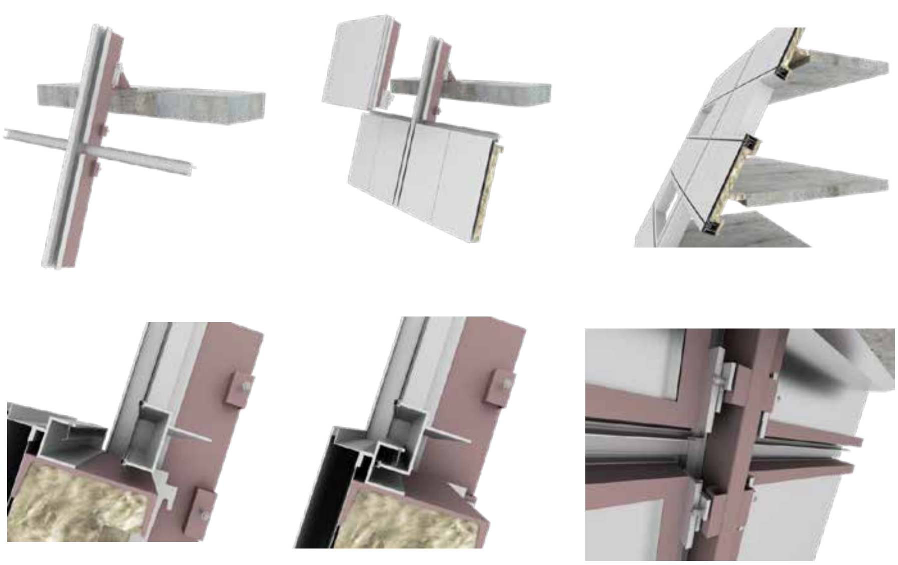
A fantastical yet functional residential building required several façade systems and thousands of unique components, even borrowing laser technology from the auto industry to achieve the hyperbolic paraboloid form of its southwest face.

EVEN IN A CITY THAT has seen it all, a new pyramid-shaped building on Manhattan's west side waterfront is a head-turner. Designed by Bjarke Ingels Group (BIG), Via 57 West brings a hint of its architect's home country, Denmark, to the city with a courtyard-centric design that gives the building a sail-like shape on the edge of the Hudson River. Ingels has said the building was conceived out of the idea of combining the density of a Manhattan skyscraper with the courtyard communal space traditionally found in Danish residential buildings. The result is a new typology called a "courtscraper" by the architect and its developer, The Durst Organization, who began discussing the 709-unit, 831,000-square-foot project with BIG in 2007.

The site did not immediately jump out as an ideal residential location. Framed by a power plant, a sanitation garage, and the West Side Highway, the building needed a sense of place and respite amid the city infrastructure. The courtyard, which intentionally has the same proportions as Frederick Law Olmsted's design for Central Park, creates this sanctuary at the center of the block between West 57th and 58th streets.

The building's tetrahedron shape, "came about from our conversations with Durst that were interested in trying to explore a mid-rise typology for the site because they actually had a rather large footprint with less density than you might normally have in a skyscraper situation," Ingels explains in an interview with the Council on Tall Buildings and Urban Habitat. Wanting to take advantage of the low buildings to the south of the site and its position at one of Manhattan's





Top The building's south façade during erection. Above the 31st floor, the mechanical level that typically tops a residential high-rise is incorporated into the top of the pyramid. Façade openings that reveal terraces below become vents for the building's systems at this level. **Above** Diagrams from an Enclos PowerPoint presentation illustrate installation of the south face's vertical gutters and façade megapanels.

widest points, BIG began creating iterations of what a rectangular courtyard building would look like and discovered they could achieve the desired Manhattan density by pulling the northeast corner into a point 470 feet in the air. The silhouette leaves water views uninterrupted for the neighboring Helena Tower, also owned by Durst.

Via 57 West's asymmetry allows sunlight to enter the courtyard and grants residents views of the river (inside, units are laid out in a herringbone pattern to orient views toward the water). From the east, the building reads as a slender spire. Thanks to its shape, it has no real roof, but instead a three-sided façade that at its most dramatic angle, facing the water, warps into a hyperbolic paraboloid, a double-curvature that slopes toward the ground. To the north and east, the façade is composed of an undulating exterior wall with high-performance glass and aluminum spandrel panels, which transition into a stainless steel curtain wall skin on the sloped portion of the façade.

This largest face of the building required complex problem solving from the start. Working with façade consultant Israel Berger & Associates, now part of Vidaris, BIG tapped façade engineering and curtain wall design company Enclos to provide comprehensive design/assist-design/build services for the north elevation's fishbone patterned curtain wall system, south facing unitized stainless steel sloped wall system, and the east- and west-facing custom curtain wall systems.

Alessandro Ronfini worked with BIG for part of the project before joining Enclos to work on Via 57 West as a senior designer in the company's Advanced Technology Studio. "There were two major challenges: waterproofing and fabrication," he says.

In order to optimize the cost of the project, Enclos designed completely pre-assembled systems in order to minimize the work in the field and save on the high cost of workmanship and logistics in New York. To do so, they designed all the vertical façades of the building as prefabricated curtain wall systems. For the hyperbolic paraboloid façade geometry, a similar approach was used: They subdivide the entire

Opening spread photograph: © Iwan Baan; drawing: BIG; this page: Enclos; facing: © Iwan Baan

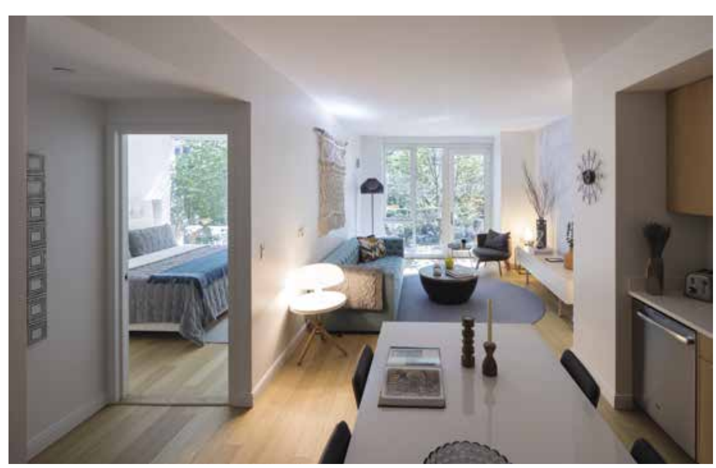
Right The landscaped courtyard creates a sanctuary for residents among the building's industrial surroundings. **Below** The lobby's grand stair (left) and one of the building's residential units overlooking the courtyard.

double-curved surface in more than 1,200 unique prefabricated mega panels, each 5 feet tall and spanning anywhere from 18 inches to 30 feet in height.

In order to fabricate curved and twisted components according to tolerance Enclos introduced a new technology, borrowed from the automotive industry: laser metrology. "Through this extremely accurate 3-dimensional scanning of each component and of each assembled mega panels we could guarantee that all the materials sent to the jobsite would fit and work together to create the unique curvature of the building's main façade," says Ronfini.

The outer, finished surface is made of stainless steel with a sandblasted finish. This non-directional finish allowed Enclos to optimize the orientation of the panels during the laser-cutting process to reduce the material waste. The material was also chosen for its soft, non glaring appearance in sunlight, and its resistance to corrosion; the building's location next to the Hudson River puts it in a coastal environment with high salinity in the air, and corrosive conditions are exacerbated by pollution from the West Side Highway. Stainless steel is the ideal material to resist this aggressive environment.

Each of the several thousands of stainless steel panels required to create the megapanels



is unique. Enclos used Rhino and Grasshopper software to generate the panels in 3-D, then automatically output fabrication drawings for each one of them. All the panels where fabricated and assembled in the Enclos facility in Richmond, Virginia, and shipped to the jobsite. Once there, each panel was picked by a crane and installed in its precise location.

The angle of the sloping portion of the façade (measured to the horizon) varies constantly from 0 degrees at the lowest corner to 67 degrees at the top of the building. "Because of all the issues that this constantly varying angle would have created to a typical stack joint, we decided instead to go with a different approach and treat the units similarly to skylights," says Ronfini. To structurally support the façade, Enclos built a network of sloping vertical rafters (these also act as tracks for the façade maintenance program) and horizontal gutters, which receive the water not shed by the stainless steel panels. "This water management system, even if more time consuming to install, was efficient and helped tremendously to locate any leakage during the construction," he adds.

With such a large surface area, water management is the sloped façade's hidden talent, preventing leaks between the complex geometries of the panels. There are two main lines of defense. The outer stainless steel panels work as a rainscreen barrier, shedding most of the water. Each stack joint is protected with a gasket to prevent as much water as possible from getting into the inner layer. The second line of defense, the network of horizontal and vertical gutters, directs additional water to a gutter at the base of the sloped façade, where it is collected and reused for irrigation. The water collection happens entirely on the outside of the façade, so no drains penetrate the skin.

Each of the rafters were prefabricated, shipped to the site and installed using custom-designed, top-of-slab steel anchors capable of 6 degrees of freedom to accommodate the inevitable tolerance of the concrete structure. The panels were then installed between rafters using adjustable hook-and-fist aluminum anchors, four for each panel (two dead-load anchors at the top and two wind-load anchors at the bottom).

"The entire geometry was unusual and the approach of prefabricating such a complex geometry was unique and as far as we know, not done before," says Ronfini. In 2015, BIG released a book entitled, *Hot To Cold, an odyssey of architectural adaptation*, presenting case studies on how the firm's work responds to a range of climatic conditions. In a chapter about Via 57 West, Ingels recalls asking Douglas Durst at one of their earliest meetings, "If they had ever considered allowing the design of the building to be directly informed by the building. In short, my question [was]: 'Why do all your buildings look like buildings?'" Years later, the building is a symbol of that question, and its answer by one architect. It's a place that mitigates the extremes of New York for its inhabitants, while showing how extreme architecture can advance the city's skyline in the future.

Above The building viewed from the west, across the Hudson River. The building's slope allows a transition in scale between low-rise structures to the south and high-rise residential towers to the north and east.
Facing An aerial view shows the courtyard, which was inspired by residential buildings in Copenhagen.

This page and facing: © Iwan Baan

VIA 57 WEST

Location: **625 West 57th Street, New York, NY**
Owner: **The Durst Organization**, *New York, NY*
Architect: **Bjarke Ingels Group**, *New York, NY*
Architect of Record: **SLCE Architects**, *New York, NY*
Structural Engineer: **Thornton Tomasetti**, *New York, NY*
Mechanical Engineer: **Dagher Engineering, PLLC**, *New York, NY*
General Contractor: **Hunter Roberts Construction Group**, *New York, NY*
Façade Consultant: **Israel Berger & Associates** (now part of Vidaris, Inc.), *New York, NY*
Curtain Wall Fabricator and Erector: **Enclos**, *New York, NY*