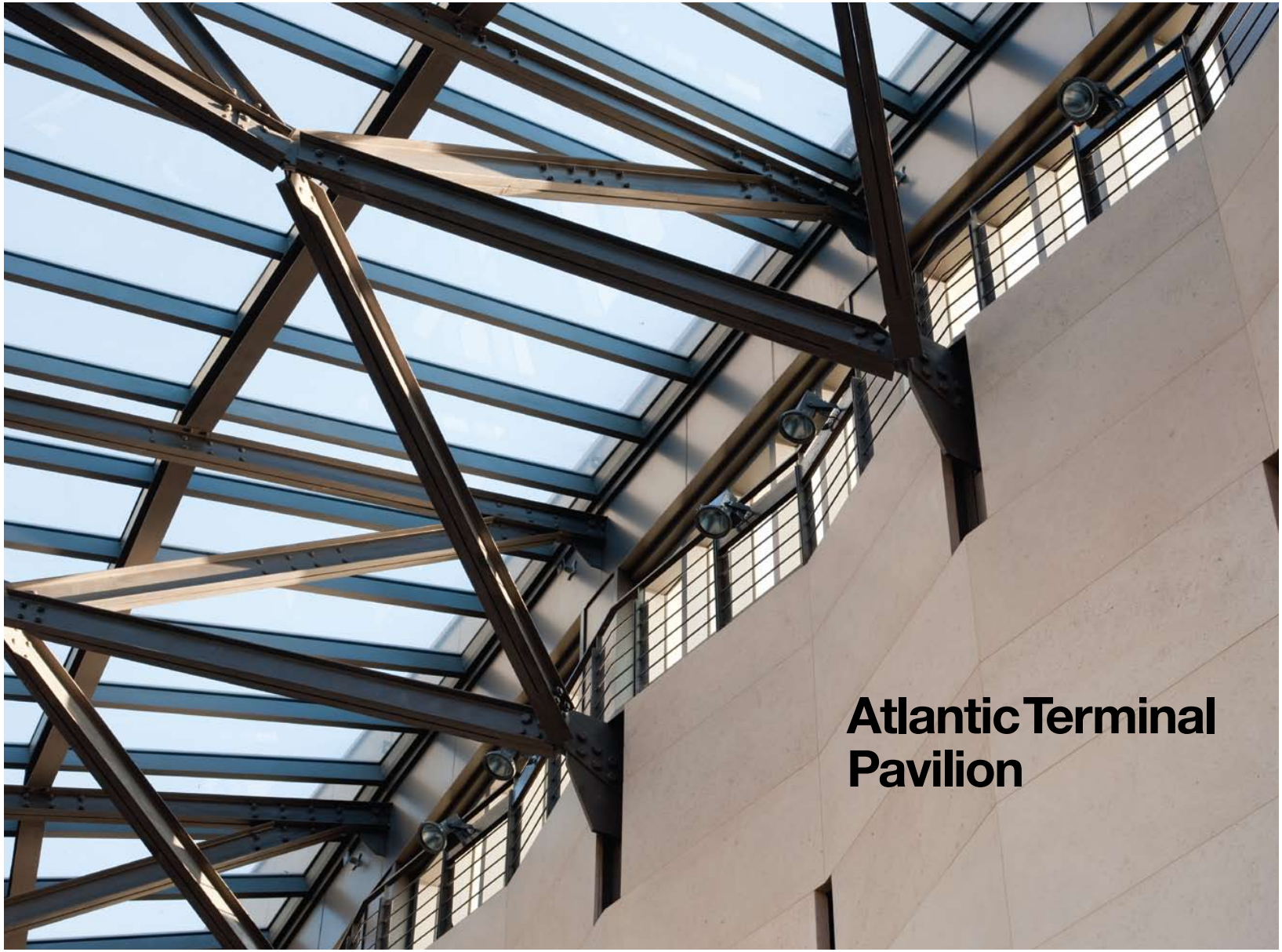


# Atlantic Terminal Pavilion

**Nothing says New York City transportation like structural steel.**

THE RECENT COMPLETION OF THE LONG ISLAND Rail Road (LIRR) Pavilion at the Atlantic Terminal Complex, on the corner of Flatbush Avenue and Hanson Place near downtown Brooklyn, has brought back to life a civic presence that graced the site from 1877 until 1988. Formerly known as Flatbush Terminal, the station connects the western-most terminus of the LIRR with ten New York City subway lines. When designing the pavilion, which serves as a entrance of sorts for a larger retail and office complex, architecture firm di Domenico + Partners and joint venture partner Parsons Brinkerhoff, along with structural engineering firm Stantec, had little to deliberate about when it came to material used for the structural system. The material had to offer the team the ability to bridge long spans, connect seamlessly to the existing office/retail complex's steel structure, achieve a more slender profile than concrete, and, perhaps most notably, further the tradition of steel structures established by the city's classic transportation architecture.

"It was important to the railroad and to us to create an open space, an atrium, which first and foremost would draw people arriving at street level to the lower level concourse, but would also create a vessel to bring natural light down to the terminal and subway," explains John di Domenico, principal of di Domenico + Partners. "Structural steel allowed us to span the distance. It is also the material of transportation in New York City, which is all about great steel structures."

The pavilion welcomes visitors with a stately curving facade of glass and Indiana limestone. Inside, the relatively small footprint (roughly 40 feet deep by 110 feet wide) is given heroic proportions by a soaring 65-foot-high atrium walled in Mirabella limestone and capped by a sloping glass skylight. A large stair strengthens the space's grandeur, following the curve of the facade as it descends into the concourse below. An aperture in the pavilion's granite floor surrounding the stair—an area known as the "Overlook"—opens the lower level to views from street level as well as to daylight streaming in through the glass curtain wall and skylight. It also presents an opportunity for commuters on the way to make a connection to look up through the transparent facade at the impressive bulk of the neighboring Williamsburg Bank Building and to the apex of the atrium, where exposed steel trusses embody the strength and grace that has been the hallmark of the city's transit structures for more than a century.

The pavilion's steel structure presented some noteworthy challenges for the team. "The new structure, which has a complex geometry, was built partially on and adjacent to an existing subterranean

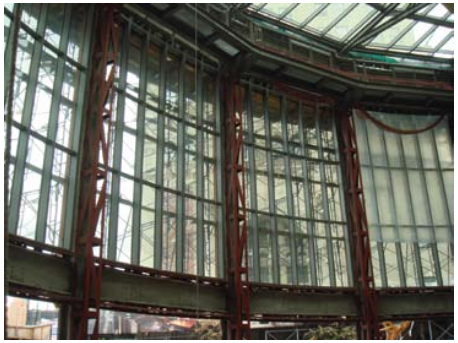
**This page** Structural steel had the ability to bridge long spans and connect seamlessly to the office and retail complex's steel structure.

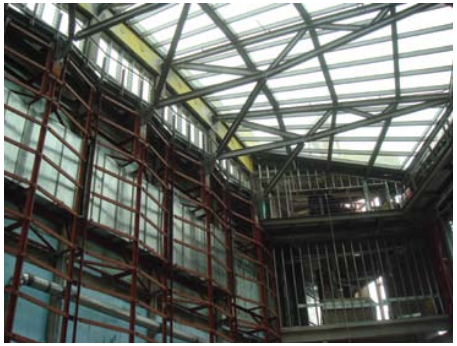
**Opening spread** A soaring 65-foot-high atrium floods the pavilion with natural light.

**Above** The station links the western-most terminus of the LIRR with ten New York City subway lines.
**Above right** A diagram of the pavilion. Transfer girders distribute the pavilion's gravity loads to the station below.

"Structural steel allowed us to span the distance. It is also the material of transportation in New York City, which is all about great steel structures."

John di Domenico, di Domenico + Partners





Previous spread: Rob Wilson; This page: di Domenico + Partners

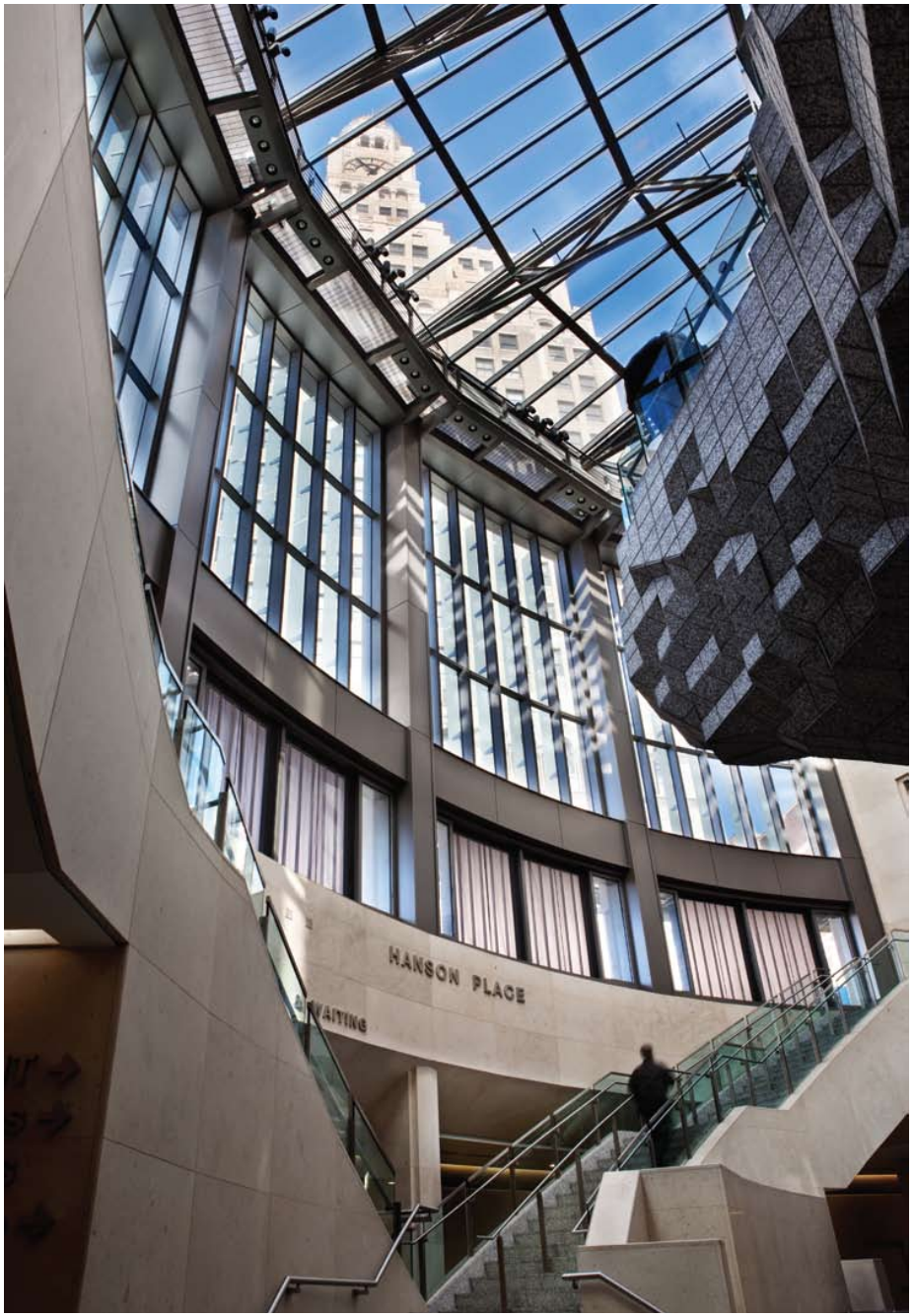
Above left: Rob Wilson; above right: di Domenico + Partners

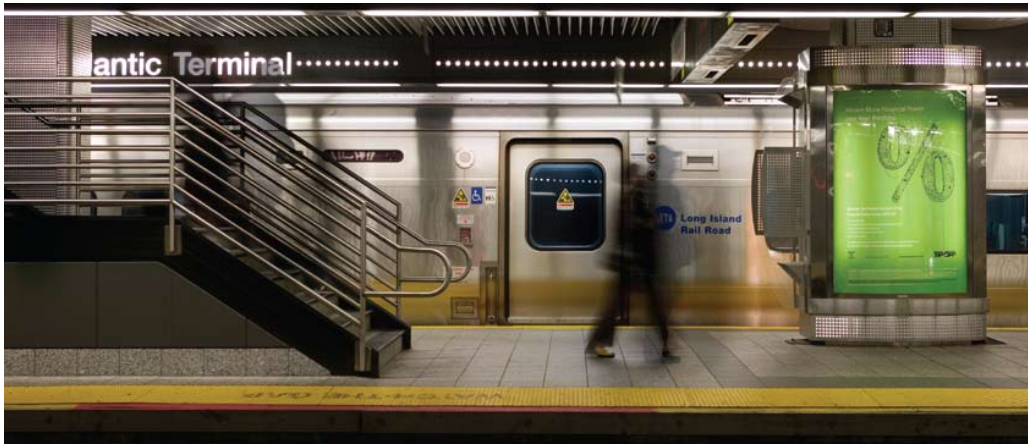
transit station," says Stuart Lerner, a vice president at Stantec. "Extensive engineering efforts had to be made to avoid overloading the transit structure below. This involved analysis to distribute the loading to specific beams and columns in the transit station that had the reuired structural capacity."

Avoiding overload of the existing transit station's structure was not the only concern, however. Lerner continues, "The design with the large open atrium required extensive analyses to minimize deflections so as to avoid any negative issues with the extensive amount of glass that was used." Fortunately for the team, the flexibility and high strength-to-weight ratio gained by using structural steel allowed them to meet these challenges with ease and without sacrificing the design intent.

By way of example, transfer girders were needed to distribute the pavilion's significant gravity loads to the transit station below. The girders were fabricated from rolled sections of various sizes with depths ranging from only 20 to 36 inches. Wide flange sections make up the structure's primary framing elements, but the careful engineering analysis allowed a range of weights to achieve graceful appearance of exposed members. Columns vary drastically in weight from W14x61 to W14x211 depending on the loads they manage, and beams exhibit similar variety, with sizes that range from W18x46 to W30x173. The majority of the structural steel is ASTM A572 Grade 50, and for the most part the members are bolted together with A325 bolts, though in some cases A490s were used for extra load carrying capacity.

While the team could have used solid members to support the skylight, a central element in the design, it chose to employ trusses instead. The exposed trusses hearken back to the history of New York City transit architecture, but there were also




**Facing** Allan Wexler and Ellen Wexler's granite-clad "Overlook" installation was commissioned by MTA Arts for Transit.

**Above** The pavilion's steel structure distributes loads to specific beams and columns in the transit station.

This spread: Rob Wilson

practical factors that influenced the decision. "The truss was used to keep the weight down while limiting deflections," says Lerner. "Additionally, the trusses were designed with careful consideration of horizontal axial loads in combination with vertical roof loads due to the way these trusses act to brace perimeter columns." The truss members are composed of built up sections, typically back-to-back C10x20 and C10x25 channels with ½-inch-thick gusset plates in between at connection locations. WT sections were also used at selective locations to facilitate connections. They were able to be left exposed by treating them with intumescent coating, which delivers a one-hour fire rating. The trusses were prefabricated, the trucked to the site, where they were picked into place by cranes.

The success of the LIRR Pavilion, as with all architecture, can only be measured in the reactions of its users. And by that standard, it has proven to be a huge success. Since its opening in January 2010, the pavilion has become a favorite meeting spot for rail passengers and pedestrians alike, all of whom are drawn to the space's heroic scale, timeless finishes, and abundant natural light. The airiness afforded by using steel trusses played a key role in creating just the right conditions for those factors to come together, and has helped to add another jewel in the great crown of New York City's transit system.

**ATLANTIC TERMINAL PAVILION**

Location: **Atlantic Avenue and Hanson Place, Brooklyn, NY**
Owner: **MTA Long Island Rail Road**, *New York, NY*
Architect: **di Domenico + Partners LLP**, *Long Island City, NY*
Structural Engineer: **Stantec**, *New York, NY*
Mechanical Engineer: **Chu & Gassman Inc.**, *New York, NY*
General Contractor: **Stonewall Contracting Corp.**, *New York, NY*
Curtain Wall Consultant: **R.A. Heintges & Associates**, *New York, NY*
Structural Steel Erector: **Lago Steel Products**, *Glendale, NY*
Miscellaneous Iron Erector: **Lago Steel Products**, *Glendale, NY*
Architectural and Ornamental Metal Erector:
**Neversink Glass Corp.**, *White Lake, NY*
Curtain Wall Erector: **Neversink Glass Corp.**, *White Lake, NY*
Metal Deck Erector: **Lago Steel Products**, *Glendale, NY*