The Standard Hotel New York

Left A steel truss anchored to the eastern concrete pier and to the Standard's western shear wall allows the hotel to make a 100-foot straddle over the High Line.

Beneath Manhattan's boldest new building, a steel truss and transfer slab does the heavy lifting.

VISIONARY HOTELIER ANDRE BALAZS' TOWERING 337-room New York Standard Hotel is anything but standard. Like a colossus boldly straddling the High Line park, an innovative public space built on a segment of abandoned elevated rail tracks threading through Manhattan's Meatpacking District, the structure stands guard over a rapidly evolving stretch of the city.

Built as a joint venture involving Greenfield Partners, HotelsAB, Dune Capital and The John Buck Company, the new 19-story, 191,000-square-foot hotel's board-formed concrete facade and vast expanses of water-white glass causally split the difference between the historic grit and burgeoning glam of New York's latest destination neighborhood. Unlike Balazs' other acclaimed properties, which retool and refurbish the latent chic of existing structures, the New York Standard is a $100 million dollar floor-to-ceiling build-out that had to contend with a number of challenges posed by its coveted proximity to the park—including a set of zoning restrictions which precluded any structural or constructive shoring off of the historic High Line.

Designed by Todd Schliemann of Polshek Partnership Architects, with structural engineering provided by DeSimone Consulting Engineers, the "Le Corbusier style" boutique hotel owes its unique height and generous span over the High Line to a hybrid concrete and structural steel truss and transfer slab which takes up the entirety of the structure's fourth floor.

"The zoning envelope for the site would have been a complete build-out with a hole in the center, which was 30 feet above the bed of the tracks and 5 feet on either side and underneath the High Line," says Schliemann. "Given the concept of the hotel, we didn't just want a building with a big hole in it, so we had to span over. The whole building had to be carried over the High Line and that's where the trusses come in."

The Standard's powerful 100-foot straddle span is made possible by a steel truss of ASTM A913 Grade 65 steel members. Anchored at the east end to the concrete pier and at the west end to the shear wall, the truss' total end-to-end length of 114 feet is constructed in two separate sections, of 65 feet and 49 feet respectively, which are joined at the center to complete the truss. Seven ASTM Grade 65 W14 members of varying lengths serve as the diagonal truss members. The majority of the ASTM A36 gusset plates and connections were shop-welded, and the intermediate framing was field-bolted with a combination of A325 and A490 bolts.

While instrumental in achieving the required span, the structural steel truss also provided the contractors with a self-sustaining scaffolding system from which the remainder of the project was staged throughout

the 24-month construction cycle. A single tower crane with an adjustable 150-foot boom erected on the northern edge of the eastern concrete pylon was used to hoist the truss members onto a series of three shoring towers and a cantilever support. Once the trusses were joined in the center and secured to the shear wall and pylon, the contractors were able to extend the boom to pick the lighter loads of the remaining material.

Effectively converting the transfer slab/truss system into a staging platform would have been impossible without structural steel. "We were planning to do these big transfer beams out of pre-stressed, reinforced concrete, which we couldn't do because we weren't allowed to shore off the High Line," says Erik Madsen, project manager with DeSimone. "Instead we used structural steel to stage everything. The trusses were erected first. Then we installed the bridging steel with metal deck to create the formwork to place an 8-inch slab on deck, which supported another 32-inch concrete pour for a 40-inch concrete platform, which is our transfer slab. From there we were able to build the rest of the building without having to shore off the High Line."

The top chords of the structural steel trusses are embedded in the transfer slab system fabricated from ASTM A611 and ASTM A653 33ksi metal deck. Shear connections of ¾-inch diameter by 5-inch headed studs transmit the shear back and forth between the concrete and the steel. The Standard's remaining fifteen floors rest atop the composite concrete and steel 40-inch transfer slab, which communicates the loads into the trusses and thereafter into the western shear wall and eastern concrete pylon.

Far from playing second fiddle, structural steel's lighter weight and incomparable strength allowed the designers and contractors to accomplish an engineering marvel while granting exposure to concrete's gritty, shabby-chic exterior. "The trusses are what made this happen," says Madsen. "Shoring over the High Line would have been nearly impossible without that Grade 65 steel, which also saved a lot of money on shipping weight and construction costs. It worked perfectly." M

Above Contractors were able to use the truss as a staging area once the trusses were joined in the center, installing a boom on the eastern concrete pylon to lift material onto the platform.
Facing Zoning restrictions prohibit any structural or constructive shoring off of the High Line.

Previous spread: Martin Perrin; left column: Helmark Steel Inc.; right: Todd Schliemann/Polshek

Nikolas Koenig courtesy Standard

"The trusses are what made this happen."

Erik Madsen, DeSimone Consulting Engineers

THE STANDARD HOTEL, NEW YORK

Location: **848 Washington Street, New York, NY**
Owner: **André Balazs Properties**, *New York, NY*
Architect: **Todd Schliemann of Polshek Partnership Architects**, *New York, NY*
Structural Engineer: **DeSimone Consulting Engineers**, *New York, NY*
Mechanical Engineer: **Edwards & Zuck**, *New York, NY*
Construction Manager: **Pavarini McGovern**, *New York, NY*
Curtain Wall Consultant: **R.A. Heintges & Associates**, *New York, NY*
Structural Steel Fabricators: **Helmark Steel, Inc.**, *Wilmington, DE*
Structural Steel Erectors: **Falcon Steel Company**, *Wilmington, DE*
Curtain Wall Fabricator: **Permasteelisa North America Corp.**, *Windsor, CT*
Curtain Wall Erector: **Tower Installation, LLC**, *Windsor, CT*