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BLOOMINGDALE'S GETS A MAKEOVER


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IMAGINATIVE USE OF THE HAKI ALUMINUM TRUSS SYSTEM "REIMAGINES" 900 NORTH MICHIGAN AVENUE RENOVATION PROJECT.

BY MATHIEU GRUMBERG

Finished in time for the 2017 holiday shopping season on Chicago's Magnificent Mile, the *Reimagine 900* revitalization project has given every part of 900 N. Michigan Avenue a new look, with a focus on the main grand entry, facades, ceiling, lighting, interior décor and acoustics. Anchored by Bloomingdale's and including Gucci, MaxMara, J.Crew, Michael Kors, and more than 60 other retailers, the entire property received a glamorous makeover.

Perhaps the crown jewel of the renovation has been transforming the existing atrium ceiling into a digital art installation with custom-produced images and videos projected on a 184-foot light-emitting diode (LED) display – the largest of its kind. A reimagined shopping experience indeed. But how does one provide access to the ceiling of a six-story, 30-foot-wide atrium without impacting shoppers and tenants? That, too, required imagination.

The building owners were highly conscious of the visitor experience and had some non-negotiable requests, according to Jim Manning, senior superintendent at Pepper Construction Company, the general contractor.

"The customer dictated that we avoid scaffolding from the ground up," he said. "Further, instead of scaffold, they wanted to see suspended swing stages to access all of the fascia work facing the atrium. Lastly, renovation work needed to occur at night, with all traces of construction cleaned up before building tenants and shoppers arrived in the morning."

On an industrial job site, the traditional approach would have been to span the atrium with steel I-beams. In this case, lugging heavy steel beams through a luxury shopping facility was out of the question, as was creating a cantilevered platform or suspending a modular work platform from the ceiling. Both were too heavy.

To find a solution, Manning turned to Spider and SafwayAtlantic. The Spider name is synonymous with its motorized swing stage platforms; SafwayAtlantic delivers urban access solutions in the New York, New Jersey, and Chicago metropolitan markets; and both are BrandSafway companies.

"Once we walked the jobsite with Pepper, we saw that the scope of the project started with being able to span the atrium, a distance of about 30 feet," says Doug Knapp, a regional product manager at BrandSafway. "We recognized that our HAKI truss system would be the best solution."

The ability to slide the suspended platform meant that renovation work on the fascia could proceed without interruptions for re-rigging.

Systems scaffold towers support W-6 I-beams, lifting the trusses over a brass railing that rings the atrium.

A custom-designed "shoe" connects the HAKI trusses to the steel header beams.

A Fast, Safe, Modular System

The HAKI truss system is a modular system that consists of lightweight aluminum trusses available in sections from 4-feet to 20-feet long. Trusses can be connected together and bracing installed to create longer spans in excess of 100 feet. Depending on span length and configuration, the system can support a safe working, uniformly distributed load of 40 to more than 400 pounds per square foot, making them well-suited for supporting a work platform. The system was developed in Europe, and BrandSafway became the exclusive U.S. distributor in late 2013, making the use of aluminum trusses a relatively new construction idea.

"I could see right away that the trusses, which came in sections and could be assembled onsite, were the answer to spanning the atrium safely, quickly and efficiently," says Manning. "All the components could be loaded onto the freight elevators."

While Pepper Construction immediately grasped the concept, trying to convey the solution to the building owners required a visual aid. To accomplish this, Pepper Construction and SafwayAtlantic created a 20-by-20-foot mock-up of the proposed solution. Seeing was believing, and the mock-up convinced the building owner to move forward.

Access to the atrium would require overcoming two additional obstacles: load limits near the up and down escalators at the east end of the atrium and the 3-foot high brass railing/glass banister ringing the atrium. Permanently connected to the floor, removing the railing would have been prohibitively costly. The solution would require a highly engineered integration of access components.

A Combined Solution

Working with building engineers to determine safe load limits and load placement, SafwayAtlantic and Pepper Construction determined that the work platform for the LED display installation would be supported by full-size systems scaffold at the east end of the atrium's fifth floor.

To lift the trusses over the brass railing, Safway created small-scale, 2-by-2-by-3-foot towers and set them on pads to protect the tile floor. W-6 steel I-beams were clamped to these towers. Specially engineered shoes and clamps secured the bottom of the trusses to the beams. Steel I-beam headers, also W-6, were then secured to the top of the trusses, and those headers ultimately supported the work platform, which consisted of 3/4-inch plywood on top of 2-by-10-inch wood planks secured with an aluminum frame.

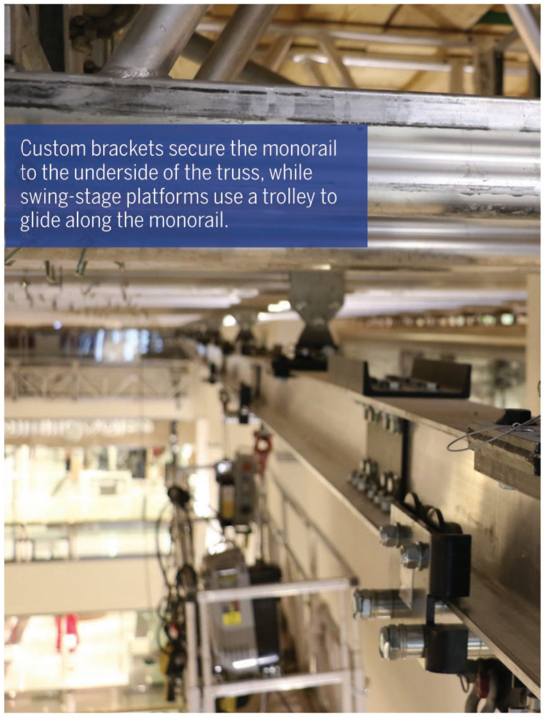
"Altogether, the project required some 460 trusses. Connected end-to-end, they would stretch for more than one mile," said Scott Metz, project manager at SafwayAtlantic. "If you look at all the components that went into creating the work platform, I think most people would consider it quite an engineering accomplishment."

Design is only half the feat, and erection on this project was anything but normal. Because the building conducted business as usual during the renovation, materials had to be brought in on a nightly basis.

"We had to manage material delivery to limit the amount of unused materials sent back at the end of the day. We weren't allowed to store anything on site," said Metz. He explained that all materials were unloaded from a truck parked on the north side of the property. SafwayAtlantic pre-bundled sections of the trusses and pre-assembled the small-scale towers so that they would fit into the freight elevator. With a six-person crew, the SafwayAtlantic team installed an average of 12 truss spans a night, all without visibility to building visitors.

"Our installation work time was about five hours per night. We spent the other three hours transporting materials and cleaning up," says Knapp. "The general public never saw any of this. They never saw dust, and they never saw work crews — just pristine scaffold and trusses. We even shrink-wrapped the towers and trusses to prevent tampering and accidents, but the clean appearance made it look like jewelry behind a case. It was the cleanest jobsite I've ever been on."

Pepper Construction was more than satisfied with the schedule. "SafwayAtlantic surprised me on how fast they erected the trusses across the atrium," says Manning. "I had planned for a week-and-a-half longer. So right off the jump in May when we got started, we made up a week and a half on the first three weeks. That helped us get done on time, which is what Pepper is known for — making our dates, along with safety, our number one value. The ability of the HAKI system to keep the project on schedule was a huge benefit."



Custom brackets secure the monorail to the underside of the truss, while swing-stage platforms use a trolley to glide along the monorail.

Systems scaffold are highlighted against the atrium's great window on Michigan Ave.

The Monorail

The need to remove old decorative metal bars from the interior faces of the columns throughout the atrium required a suspended platform. So, while the onsite team erected access to the atrium ceiling, Spider engineers designed clamps to suspend aluminum I-beams from the trusses. After clamping the beams together and suspending them, SafwayAtlantic had created what it believes to be the first monorail suspended from an aluminum truss system.

"The swing stage idea was a perfect fit for this project," says Manning. "It was also the first time I've used it on a monorail, which is really slick. That helped us to beat our schedule. Being able to slide the stages as restoration work progressed eliminated the set-up time that would normally be required when moving a suspended platform."

In total, Spider suspended five swing stages around the atrium. Like all other components on the project, the swing stages featured a modular design that enabled components to be moved and assembled on site. The swing stage at the west end of the atrium consisted of two 10-foot and one 5-foot section, creating a 25-foot platform that enabled workers to access the entire width of the atrium with a single stage. During regular business hours, the swing stages were raised to the bottom of the work platform or suspended unobtrusively, parallel with a floor.

"Working with Pepper Construction, we developed a plan that made this renovation look like a finished project during the project," says Metz. "Pedestrians never had to deal with the cumbersome clutter of a typical construction job site – and that includes visual distractions as well as physical barriers. This project required a lot of versatility, and SafwayAtlantic made it happen." •

About the Author

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