

# Chicago Union Station

## Historical Preservation & Restoration

› As envisioned by famed Chicago architect Daniel Burnham, Union Station is lauded as an architectural and historic triumph. Built in 1925 to replace the old Union Depot, today Union Station is the country's third busiest rail terminal, accommodating more than three million passengers annually.

To preserve its grandeur, Chicago-based Berglund Construction Co. undertook a major restoration project that started in September 2017. This involved preserving the station's original barrel-vaulted skylight

(ultimately with 2,052 pieces of new glass), constructing a new, high-efficiency skylight (858 pieces of glass) adding weather-proofing, and painting and repairing water-damaged plaster and stone.

“The objective of this job was true historical preservation,” says Mike Clarahan, onsite project manager for Berglund Construction. “There was a lot of research, especially on the design side, to help us get back to the original finishes and replicate them. We wanted to bring it back to its original 1920s glory.”



Renovating Union Station's Great Hall required a combination of 22,000 square feet of QuikDeck, Systems Scaffold, two Beta Max Hoists and two Spider Swing Stages, pictured in the photo above



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However, gaining access to the 219-foot-long skylight, 115 feet above the floor of the Great Hall, presented a major challenge.

"We absolutely could not impede passenger flow," says Clarahan. "In lieu of a full supported scaffold buildup, which would have disrupted passengers, we used the

**Finding an anchor**

"But first we had to overcome the challenge of how to suspend the QuikDeck," says Doug Knapp, regional product manager, BrandSafway Infrastructure Service Group. "Because of the historic nature of Union Station's vaulted

passenger areas, nor would Berglund be able to move its construction materials."

To solve the problem, BrandSafway built a six-story skip hoist on the outside of the building and created a 100-foot runway. Materials would move from street level, up the hoist, across the runway, through the unoccupied sixth floor, across the scaffolding and finally across ramps to reach the vaulted roof.

Complicating matters, the skip hoist could not be tied directly to the outside of Union Station because of its architectural significance. To solve the problem, BrandSafway designed a steel

After erection, QuikDeck created a rigid, flat and stable work platform upon which BrandSafway erected rolling scaffold towers for the glazers, plaster restoration and painting crews and other trades.

"They could roll the scaffold tower in any direction without having to dismantle it and pick it up over joints," says Knapp. "Berglund's crew had fast and easy access to the entire ceiling and skylight."

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QuikDeck® Suspended Access System from BrandSafway. Being able to present the QuikDeck solution upfront to Amtrak helped Berglund win this job."

The QuikDeck system uses 8-foot trusses that connect to a central node via a pin and retainer clip system. Three-eighths-inch grade 100 chain running through the central node connects to beam clamps attached to the structure. Once pinned (no tools required), the trusses pivot outward, and workers then secure 3/4-inch-thick sections of structural grade-one plywood with oil-sealed edges to provide a flat, stable and sturdy work surface.

"We used QuikDeck as a work platform and protective deck to shield passengers on the floor from restoration debris," says Clarahan. "We had additional pipe scaffold on top of the deck, which solved the challenge of getting to the underside of the ceiling arches, about 25 feet in the air. It wound up being no problem because of the QuikDeck."

ceiling, we were not able to suspend from the bottom of the beams. We had to design clamps that would connect from above." A five and a quarter inch diameter, wall steel tube forms the backbone of the beam clamp. Twenty cross-drilled holes provide adjustable pivot points for C-clamps that grip the beam on either side and offer connection points for the chain or wire rope.

While catwalks near the roof's 16 arched beams made installing the clamps easy, accessing the roof was a challenge because exterior walls hem in the north and south sides of the roof, and there are no egress points. The east and west sides have a two- or three-story drop-off, creating a gap between the wall and the roof.

"We needed to get workers to the barrel roof, and to do that we had to build scaffolding in the gaps," says Paul Johnson, account manager, BrandSafway. "However, we could not move that volume of material through the

structure to support the hoist and worked with local ironworkers to weld it.

**Michelangelo's dream platform**

After gaining access to the roof, Berglund installed the beam clamps, removed select panes of old glass, connected the chains and wire rope for suspension and sealed the gaps with heavy-duty LDPE (low-density polyethelene) sheet. Work proceeded at a pace to match the platform build out, which started with a 16-by-16-foot starter platform on the floor of the Great Hall. Hoists mounted to each corner then raised the platform approximately 90 feet, or until it was level with the bottom of the vaulted roof. Once the starter platform was secured, BrandSafway then built out the entire 22,000-square-foot suspended work surface.

"The last train arrives at 11:30 p.m. and the doors open at 5 a.m., so we completed all our work in the Great Hall from midnight to 4:30 a.m. to eliminate passenger disruptions," says Johnson. "We primarily used an 11-person crew: two or three people on the ground, two raising material, two 'leading edge' people installing the platform and two up top transporting material. We synchronized our efforts during the whole project."

Clarahan. "Being able to use it as more than just a protective deck (debris shield) for the work area below was huge. We have not used QuikDeck before. Now that I have experience with it, I'm a fan."

**Supporting the load**

In addition to ceiling restoration, Berglund needed to restore the east and west side walls and columns in the Great Hall because of water damage. While a narrow gap between the suspended platform and the wall on the west side enabled hanging swing stages from the building's structural elements, no gap existed on the east side.

Fortunately, with a load rating of 25-75 pounds per square foot, QuikDeck could also provide suspension points for swing stages on the east side. To distribute the load suspended beneath the platform, Berglund erected aluminum header beams on top of the QuikDeck and hung the swing stage directly from the headers. Because this portion of QuikDeck was cantilevered about eight feet out from the nearest truss node, Berglund connected the header to structural elements at two additional points. This required making small holes in the plaster ceiling, a far smaller amount of damage than other options.

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## Value Proof

Start date:	September 2017
Completion:	April 2019
Location:	Chicago, Illinois
Branch :	SafwayAtlantic Chicago Branch
Scope of work:	Access to Great Hall ceilings and facades, and vaulted barrel roof from above and below
Product/Services:	22,000 sq. ft. of QuikDeck®, two Spider® Swing Stages, Systems™ Scaffold, two Beta-Max-Hoists
Safety record:	Incident free
Value	\$2.1 million

“The project used three Spider® Swing Stages hung off the QuikDeck,” says Johnson. “It’s an engineering feat, but it was the most efficient way to hang them. If needed, we can also hang swing stages from a monorail to provide lateral and vertical access to an entire wall.”

### Throughout the Great Hall

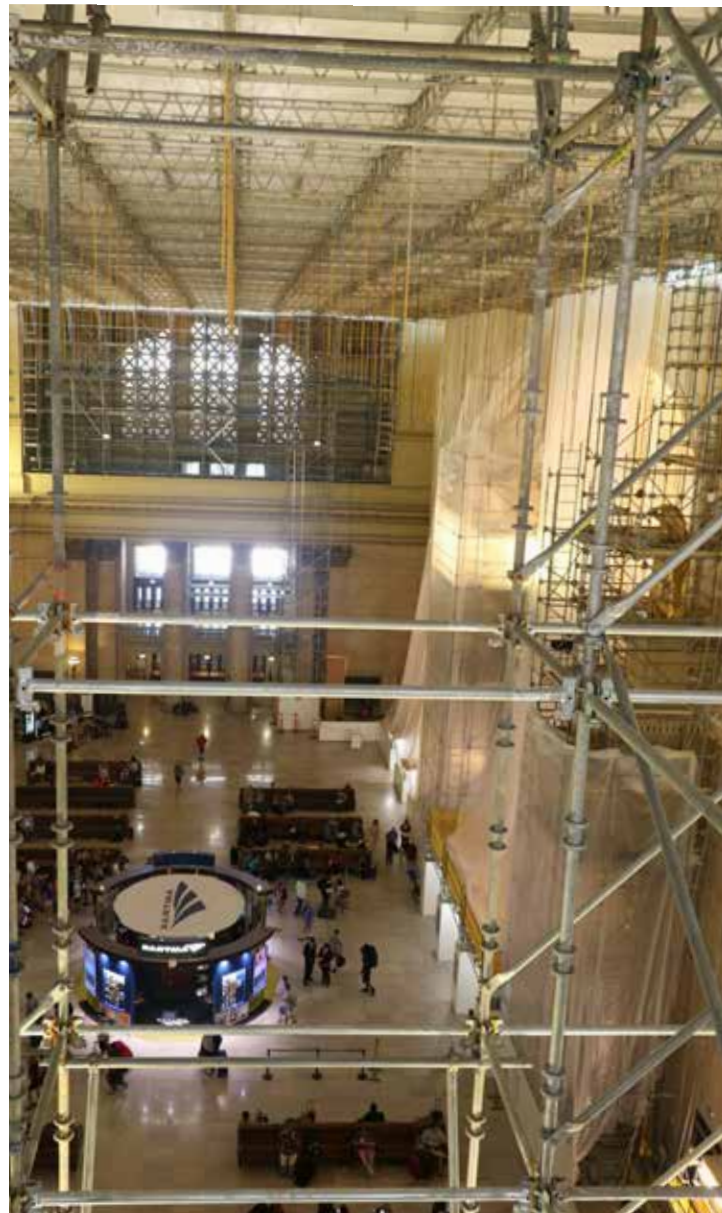
Restoring Union Station to its original splendor required Berglund workers to access all areas of the Great Hall. BrandSafway erected Systems™ Scaffold on the balconies, breezeways and stairways out to Canal Street and installed scaffold towers to provide access to two 13-foot-tall statues overlooking the Great Hall.

“On the south side of the Great Hall, we installed a Beta Max Hoist to bring material up from the hall floor to the QuikDeck,” adds Johnson. A similar hoist ran up the north side balcony scaffold, which workers could access via freight elevator.

“From the floor to the ceiling, to the walls, halls and roof, we recognize the importance of coordinating multiple solutions,” says Knapp. “That helps Berglund go to its customer and present not just a complete solution, but the safest and most productive solutions for all the trades.”

“BrandSafway did a great job of walking us through the solution,” says Clarahen. “They presented everything up front, and that played a huge part in winning this job.”

A Beta Max Hoist on the south wall of the Great Hall transports materials to the suspended platform, while balcony scaffold provided access to the ceiling and walls. >



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