

Bridging the Gap

Installing the arch keystones on the I-74 bridge over the Mississippi River

› With the westbound section finished in 1935 and the eastbound section finished in 1959, the I-74 Mississippi River Bridge was built to connect the Quad Cities, a series of metropolitan areas near the border of Iowa and Illinois, separated by the river. Since the bridge's construction, those cities have grown, and traffic has grown alongside them. As of 2016, the bridge saw 74,000 vehicles every day, and, by 2035, that number is expected to rise ›



“BrandSafway’s Truss Frame System was a very easy-to-assemble, lightweight-yet-sturdy solution.” ›

BRAND › **SAFWAY**®

At Work For You®

“Safe, simple and capable of holding up the jacking rams required to push the leaning arch segments into place.”

to nearly 100,000. To accommodate this rising demand and improve access across the river, the departments of transportation in Illinois and Iowa created a joint plan to construct a completely new bridge to replace the original. This modern bridge would have more lanes, multi-use paths and white steel box girder arches that would provide both suspension and aesthetics. It was those arches that required a unique access solution.

Placing the keystone

Each arch would be built simultaneously from both sides of the bridge. As the two sections came together in the center, a final keystone piece

platform and suspensions points to complete the work. However, that would have required time and money to engineer and manufacture, and BrandSafway had a solution at the ready. A 40-by-60-foot Truss Frame platform was hung from the underside of the arch segments, bridging the gap between the two. With capacities up to 150 pounds per square foot, built from a few basic modular components and outfitted with guard rails, this platform was safe, simple and capable of holding up the jacking rams required to push the leaning arch segments into place.



With capacities up to 150 pounds per square foot, built from a few basic modular components and outfitted with guard rails

needed to be slotted in to connect them and complete the structure.

However, sliding the keystone into place was easier said than done. Both segments of the arch lean inward, meaning that they would have to be pried apart to create space while the keystone was craned in.

The work also had to be done quickly, as weather conditions allowed. Even mild winds caused the arches to sway, creating a hazard that would halt the work. Adding further to the time crunch, the waterway beneath the bridge would need to be shut down, blocking all barge traffic. Working within these constraints meant completing the entire keystone installation within 72 hours.

Truss Frame System

Lunda Construction, the general contractor for the job, could have designed their own custom

“We had considered designing a solution in-house, but everything we came up with would have been too heavy,” said Curtis Ihrig, senior project manager for Lunda. “BrandSafway’s Truss Frame System was a very easy-to-assemble, light-weight-yet-sturdy solution. It provided a flat, secure work area for our crews, and it allowed us to safely make the connection to close the arch.”

Innovative RSP brackets

Installing the platform posed its own challenges. There were limited viable suspension points, and the Truss Frame platform used on the arch required it to be suspended with compound angles; something standard suspension brackets can’t handle. This is where the BrandSafway-engineered rotating suspension point bracket (RSP) comes in. Its chain-to-wire-rope connector rotates around the bolt, as well as the pivots, to allow



Working within these constraints meant completing the entire keystone installation within 72 hours 🏆



Project Summary

Project:	Interstate 74 Mississippi River Bridge Construction
Location:	Bettendorf, Iowa and Moline, Illinois
Dates:	April 23-May 30, 2020
Scope of Work:	Engineer access solution for installation of keystone piece on arch
Product:	Truss Frame System, rotating suspension point brackets
Safety:	Zero incidents
Value:	\$20,000

› the load to pull in a straight line, regardless of angle, and its spherical washer makes it possible to bolt the assembly to angled structures.

With RSPs in hand, the BrandSafway engineering team worked closely with Lunda to design an eight-point suspension configuration, which would allow the

“Its spherical washer makes it possible to bolt the assembly to angled structures” ➤

platform to be attached to the existing rigging holes in the arch. In addition, eight more suspension locations using RSPs were planned as secondary suspenders to provide additional safety to the ironworkers during the installation work.

Bringing it all together

With the crew working around the clock for only 34 of the allotted 72 hours while the riverway was closed, the Truss Frame platform was installed, hydraulic jacking rams pushed the arch segments outward, and the keystone piece was smoothly craned into place.

BrandSafway’s solution got the job done, saved time and money, and earned future work from the customer. “Our price to rent and bring the Truss Frame System to the jobsite cost less than any kind of one-off system we could have engineered,” said Ihrig. “We intend to use this same solution on a project adjacent to this one.” ‹

