Prize Bridge Award – Movable Span

BSNF RAILWAY BURLINGTON BRIDGE, BURLINGTON, IOWA

The reconstruction of the century-old BNSF Burlington Bridge over the Mississippi River at Burlington, Iowa began in 1991 when the United States Coast Guard issued an Order to Alter under the Truman Hobbs Act for replacement of the swing span. The bridge was a hazard to river traffic due to the narrow navigable width of approximately 160 ft on either side of the center pivot pier. The replacement structure needed to provide a minimum 300 ft of horizontal channel clearance and 60 ft of vertical clearance above the normal pool elevation.

This directive to replace the existing swing span led designer HNTB Corporation to study various alternate designs and alignments, thus leading to the selection of a vertical lift span to replace the swing span on the existing alignment. Nearly two decades after the Order was issued—and following preliminary studies and design and final design of project—replacement of the swing span commenced in 2009, with a portion of the federal funding provided through the American Recovery and Reinvestment Act of 2009.

During construction of the replacement span, not one, not two but nine flood events occurred. In fact, out of the 680 days from notice to proceed to substantial completion, 143 days were at or above the flood stage and a total of 192 days were lost due to unseasonably high river elevations. While other items, such as the lift span erection on barges, could continue during flood events, critical path substructure was delayed.

HNTB's railroad experts were on call throughout the project, and participated in design review meetings on site, allowing for construction issues to be addressed ahead of time to keep the project moving forward. In an effort to reduce construction cost, BNSF researched their inventory for secondhand deck plate girder spans that could fill the gap left following removal of Span 6. Six individual spans were needed, four at 80 ft in length and two at 93 ft, each span supporting one track. BNSF was able to locate four 80-ft, two-girder spans that could be reused with minimal rehabilitative work (in an effort to minimize the environmental footprint, HNTB reused as much of the existing structure as possible, including the existing bridge


HNTB


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Matt McDonald, Photographer


Pat Seiple, Photographer

piers). The spans were shipped to the BRT Staging Yard as individual girders and a new cross frame system was installed on-site. The 93-ft deck plate girder spans were designed by HNTB and were constructed of new material. The spans consisted of four deck plate girders with internal cross framing. These spans were also erected on site and stored until needed.

Owner
BNSF Railway Company

Designer
HNTB Corporation, Kansas City, Mo.

General Contractor
Ames Construction, Burnsville, Minn.