

I-35W St. Anthony Falls Bridge

Planning the Replacement

by Jay Hietpas, Minnesota Department of Transportation

In a little over 1 year since the tragic collapse of the I-35W Bridge on August 1, 2007, two new river crossing bridges and their approaches will be completed this year. Although the contract requires that the construction be completed by December 24, 2008, the project was opened to traffic on September 18. The rapid replacement of the I-35W over the Mississippi River once again re-established the vital transportation link to destinations such as downtown Minneapolis and the University of Minnesota.

The 140,000 vehicles that used the previous eight-lane structure had to find alternative routes. The impact resulted in additional congestion on the local and regional road system, with a daily road user cost of \$400,000. This impact value does not include the economic impact resulting from the closure of I-35W.

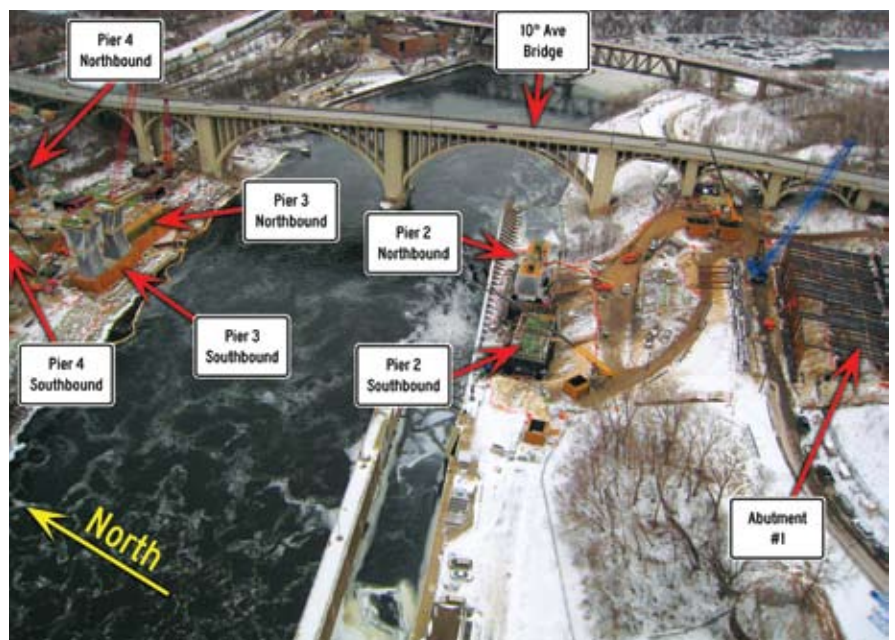
Moving forward with the rebuilding effort was much more complex than simply replacing the structure. The roadway approaches did not meet current capacity or design standards. A large portion of the project site contained contaminated materials from past industrial uses. Stakeholders and citizen groups expressed differing views on the visual quality approach to the project. Site conditions included an Army Corps of Engineers lock and dam system, limited right-of-way to expand capacity, six railroad tracks under the

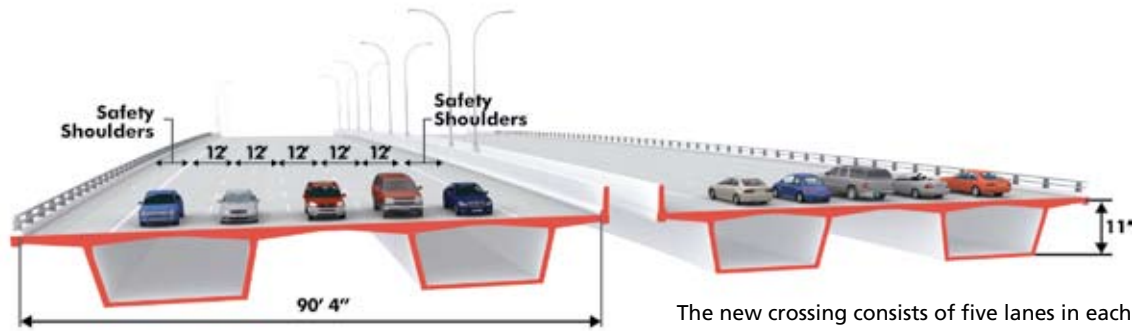
structure, major underground utilities, and dealing with the removal of the collapsed structure.

By working closely with stakeholders within days of the collapse, the Minnesota Department of Transportation (Mn/DOT) rapidly defined the scope of the project. The new I-35W bridge was to be reconstructed as two new river bridges, each built to accommodate five lanes of traffic in each direction for a total of 10 lanes plus standard-width shoulders. Project elements also included improving the geometric deficiencies in the corridor, reconstructing the ramps at the interchanges on each side of the bridge, and accommodating a future light-rail transit system on the new structure.

The process was expedited in order to begin construction prior to the winter season. Photo: Mn/DOT.

Schedule Prior to Contract Award	
August 1	Bridge 9340 collapses
August 4	Mn/DOT issues RFQ
August 8	Five teams respond to RFQ
August 8	Mn/DOT short-lists five teams
August 23	Mn/DOT issues RFP
September 14	Technical proposals due
September 18	Price proposals due
September 18	Mn/DOT interviews design-build teams
September 19	Project letting
October 8	Contract executed





The new crossing consists of five lanes in each direction with standard width shoulders, and can accommodate a future light-rail transit system. Rendering: © FIGG.

Design-Build Process

Within days of the collapse, Mn/DOT began the process of rebuilding this vital transportation link. To expedite the project delivery, Mn/DOT chose to use design-build over a traditional design-bid-build approach. Design-build allowed for speed of project delivery, design flexibility, and construction innovation. Mn/DOT allowed design-build teams to choose from seven allowable bridge types, propose geometric solutions that address current substandard elements, and develop the visual quality components to the project.

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Minnesota state statutes require a two-step procurement process for design-build projects. The first step involves short-listing the most highly qualified teams in response to a Request for Qualifications (RFQ). In step two, the short-listed teams submit technical and price proposals in response to a Request for Proposals (RFP). The price proposals remain sealed until the scoring of the technical proposals is complete.

The design-build process was expedited in order to begin construction prior to the winter season. On a typical Mn/DOT design-build project, the procurement timeline is typically 6 to 12 months. On the I-35W project, letting of the contract occurred on September 19, only 50 days after the collapse.

Due to the expedited nature of this procurement process, Mn/DOT

had extensive communication with the design-build teams during the development of the design-build RFP. Daily one-on-one meetings were conducted with the design-build teams. These meetings allowed design-build teams to receive real-time updates on scope changes and ask questions about the project. Mn/DOT also allowed each team a weekly one-hour site visit. In addition, each design-build team established a single point of contact that had 24-hour access to Mn/DOT's design-build communication manager.

In addition to extensive communication with the design-build teams, Mn/DOT had extensive contacts with regulatory agencies, utilities, and impacted stakeholders during the procurement process. Mn/DOT secured eight out of ten regulatory permits prior to letting. The other two permits were the responsibility of the contractor. By actively involving all the interested design-build teams in the utility coordination process before letting, a major gas relocation line could be relocated concurrently with the design-build procurement process. Mn/DOT established a Visual Quality Advisory Team (VQAT) to define the aesthetic framework for the project. Design-build teams met with the VQAT on several occasions to develop their aesthetic approach for incorporation into their proposals. Coordination with the railroad allowed for the removal of five railroad tracks and shortening of the bridge.

As the RFP was being developed, Mn/DOT used the goals of the project to define how the design-build proposals

were going to be evaluated. The goals of the project included constructing a project safely, producing a high-quality project, completing construction by the end of 2008 within the allowable budget, allowing public input into the design and visual quality aspects of the project, and addressing stakeholder concerns throughout the project.

On a traditional process, the public input and visual quality aspects would have been addressed prior to letting. On this project, these processes occurred simultaneously with the project. Many stakeholders were concerned that the public would not have adequate input into the design features of the bridge. To address these concerns, Mn/DOT emphasized design flexibility to the design-build teams. The proposed approach was to not only obtain public input, but also provide a mechanism to incorporate public feedback into the design and construction process.

During the proposal preparation process, Mn/DOT allowed each team to submit up to eight Alternative Technical Concepts (ATC). An ATC allows a team to submit an equal or greater value change to the RFP. To expedite the Mn/DOT review times, ATCs were limited to the structural and foundation sections of the RFP. Each ATC was kept confidential and not shared between the competing teams.

Design-build teams were allowed to submit a 20-page response to the RFP. In addition, 10 pages were allowed for design plans and 10 pages were allowed for resumes. Four teams submitted proposals for the project.

Mn/DOT had extensive communication with the design-build teams and stakeholders.



The winning bid included a proven approach to visual quality that allowed the community to select several visual components of the bridge and approaches. Rendering: © FIGG.

Scoring Method

Technical proposals were scored by a six-person evaluation panel. The average score of the six scoring members for each team became the official technical score. In addition to the six scoring members, 21 other individuals assisted with the evaluation process. The evaluation group included Mn/DOT, City of Minneapolis, the National Park Service, the Federal Highway Administration, the Association of General Contractors, and the Minnesota Department of Administration.

Evaluation Criteria	Points
Experience of key individuals on similar projects	20
Design and construction relationships	10
Safety approach	10
Construction quality approach	10
Visual quality enhancements	10
Visual quality approach with stakeholders	10
Roadway design elements	10
Life-cycle structural design approach	5
Public involvement	15

In addition to the technical score, the price and time components were also evaluated. In accordance with state statutes, the selection formula consisted of cost plus time, divided by technical score. Design-build teams were allowed to bid between 337 and 437 calendar days to complete the project. The number of days was multiplied by \$200,000 (half of the daily road user cost) and added to the price proposal. This value was then divided by the technical score. The lowest adjusted score was determined as the best value.

The technical scoring was completed before the price and time components for the project were known. The technical scores ranged from 55.98 to 91.47, the cost ranged from \$177 to \$234 million, and the time components ranged from 367 to 437 days. The contract was awarded to Flatiron-Manson, who had the technical score of 91.47, a price of \$234 million, and a time component of 437 days.

Although the Flatiron-Manson team had the highest cost and longest time, their technical approach and score was substantially higher than the other proposing teams. The Flatiron-Manson team eliminated the six geometric deficiencies, accommodated future infrastructure needs in the area, and provided structural benefits that reduced future maintenance and reconstruction costs. The Flatiron-Manson approach also included a proven approach to visual quality that allowed the community to select several visual components of the bridge and approaches.

This project was a major engineering challenge for all design-build teams. With limited access to the project site due to the collapsed structure, the design-build teams had to rely on limited subsurface investigation data. The project also presented major cost and schedule risks due to utility relocations, unknown site conditions, and contaminated materials. Due to these risks, construction could have easily extended into the summer of 2009.

Incentives

To ensure that the project would likely be completed in 2008, Mn/DOT offered incentives to complete the project on time. If the job was completed on time and the contractor waived all outstanding claims, a \$7 million incentive would be paid to the contractor. The contract also allows early completion incentives up to an additional \$20 million if the project is completed 100 days early. This incentive value is calculated based on half of the roadway user cost impacts to the project.

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Photo by Tim Davis/Courtesy of FIGG



Less than one year after the tragic collapse of the I-35W Bridge, employees cheer as a barge-mounted crane lifts the final concrete segment into place on the main span of the new I-35W Bridge. The Flatiron-Manson joint venture expects to open the new bridge to traffic three months ahead of schedule. The bridge took just eleven months to build, but the experience will undoubtedly last a lifetime. **Best moments happen all the time in people's lives. Here at Flatiron, we're proud to make some of them possible.**

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