



2012 – Maryland Avenue Bridge

Description

Meta Fields

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https://www.fhwa.dot.gov/hfl/projects/mn_abc_spmt_i35e_stpaul.pdf

Specifications 0 Spec File : 2256

Abc Construction Equipment : SPMT(s)

Miscellaneous Prefabricated : thin-bonded epoxy overlay

Prefabricated Bridge Systems : FDcBc {Full-Width concrete-Decked concrete Beam Unit}

Contracting : best value award

Project Delivery : design-build

Longitude : -93.0886459

Latitude : 44.9771461

Nbi # : 62626

State Id # : 62626

Construction Equipment : SPMTs

Total Bridge Length Ft : 210.5

Max Span Length Ft : 102.75

Beam Material : Concrete

Spans : Two-span

Location : Urban

Owner : State

State : MN

Year Abc Built : 2012

Rapid Embankment : EPS geofam

Other Related Url : 4

Contract Plans : 1

Incentive Program : \$2,000,000 HfL [Highways for LIFE] grant

Costs : The engineer's estimate for the project was \$ 4,181,042. The low bid was \$4,818,572. There were 5 bidders. The cost per square foot of bridge was \$191.36 compared to \$120.0 for conventional construction in this region during the same time period.

Contacts : Paul Rowekamp, P.E. Bridge Standards and Research Engineer Minnesota Department of Transportation paul.rowekamp@state.mn.us 651-366-4484 **Submitter:** Paul Rowekamp, P.E. Bridge Standards and Research Engineer Minnesota Department of Transportation

paul.rowekamp@state.mn.us 651-366-4484 **Designer:** Parsons Transportation Group Vince Gastoni P.E. vincent.gastoni@parsons.com 612-309-3707 **Contractor:** Dennis Behnke Lunda Construction 651-437-9666 **SubCon1:** Mammoet SPMT move 281-369-2200

High Performance Material : Lightweight fill (expanded polystyrene blocks) to minimize future settling over the soft soils in the project area

Stakeholder Feedback : The use of the Design/Build contract administration method was critical to making this project successful due to the required coordination and communication between the contractor and designer. Feedback from local residents and stakeholders was very positive, due to maintained mobility during construction. Through the use of innovative construction technology, MnDOT was able to dramatically reduce the impact of this project's construction on roadway users. The overall project construction closure of Maryland Avenue was reduced from 4 months to approximately 2 months, resulting in a 50 percent reduction in construction time impacts to users of Maryland Avenue. This innovation also significantly reduced the impact felt by I-35E users. Traditional construction would require many lane closures to construct the superstructure over traffic. MnDOT engineers anticipated that traditional construction would result in 12 days of off-peak lane closures. The use of innovation on this project reduced this time to 3 days. Thus, MnDOT was able to reduce impact/inconvenience by 75 percent.

Construction Method : The prestressed beams for the two-span structure were fabricated offsite, shipped to the staging area near the bridge site, and erected on storage containers and a structural frame used for temporary supports. The full-depth cast-in-place concrete deck included a small amount of post-tensioning to reduce the potential for deck cracking during the move. The new permanent abutments and pier were built on piling after the existing bridge was demolished. The new substructures were entirely cast-in-place. Traffic on interstate 35E was closed for 24 hours to accommodate the move. Each of the two 105-ft spans was moved separately, approximately 1000 foot from the offsite fabrication location. After the move was complete, the contractor applied a thin-bonded epoxy overlay to the bridge deck.

Replacement Or New Bridge : The replacement bridge has four through-lanes, three turn-lanes, a concrete median and two 10-foot sidewalks. The cross-section consists of thirteen 45-inch-deep prestressed concrete beams spaced at 9.5-ft with a 9-inch-thick cast-in-place reinforced concrete deck with a thin bonded epoxy wearing course. The cast-in-place parapet abutments were founded on piling, as was the center pier.

Existing Bridge Description :

The existing 4-span prestressed concrete beam bridge was 199-ft long and 100-ft wide with pile-supported substructures. It had four through-lanes, two turn-lanes, a concrete median and two narrow sidewalks. Built in 1957, the bridge was deteriorated; it did not meet the necessary geometrics for the project and required replacement.

Average Daily Traffic At Time Of Construction : 28500

Dimensions : 210.5-ft-long and 121.3-ft-wide 2-span prestressed concrete I beam bridge (102.75 ft x 102.75 ft); 8° skew

Primary Drivers : reduced traffic impacts; reduced onsite construction time; improved work-zone safety; improved site constructability

Impact Category : Tier 5 (within 3 months)

Mobility Impact Time : 60 days ABC vs. 100 days conventional construction

Project Location :

on Maryland Avenue over Interstate 35E in the city of Saint Paul in Ramsey County

Project Summary :

SPMT bridge move