



2012 ??? Maryland Avenue Bridge

Description

Meta Fields

Project Summary : SPMT bridge move

Project Location : Maryland Avenue over Interstate 35E in the city of Saint Paul

Mobility Impact Time :

- ABC: 60 days
- Conventional: 100 days

Impact Category : Tier 5 (within 3 months)

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

Average Daily Traffic At Time Of Construction : 28500

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.

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 I-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.

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.

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.

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

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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 \$120.00 for conventional construction in this region during the same time period.

Funding Source : Federal and State

Initiating Program : \$2,000,000 I-35 Highway for LIFE grant

