2005 â?? Route 1 Bridges over Olden Avenue & Mulberry Street

Description

Meta Fields

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Project Location :

On Route 1 through the city of Trenton in Mercer County on western edge of New Jersey

Mobility Impact Time : ABC: One weekend closure per superstructure replacement (56 hours or less per bridge) ; Conventional: 22 months for conventional design & construction
Impact Category : Tier 2 (within 3 days)
Dimensions : Over Olden Avenue Connector: 86.8-ft-long and 35.0-ft wide single-span two-lane MDcBs bridge; Over Mulberry Street: 60-ft-long and combined 82.2-ft wide single-span four-lane MDcBs bridge
Average Daily Traffic At Time Of Construction : 50000
Traffic Management : Traffic management alternative, if constructed conventionally: extended use of detour
Existing Bridge Description : The decks of three single-span bridges, one at the Olden Avenue Connector and two adjacent bridges at Mulberry Street, were deteriorated and required replacement. The replacement of these three bridges was the NJDOTâ??s first Hyperbuild project.
Replacement Or New Bridge : Each superstructure span consists of five full-length segments of varying width, each with two Grade 50W steel girders and a 9-inch-thick composite concrete deck (Inverset-type) system. The 86.8-ft-long bridge span over Olden Avenue required W36x182 girders, and the 60-ft-long bridge spans over Mulberry Street required W30x99 girders.
Construction Method : The 15 segments were designed and fabricated at a New York precast plant, assembled at the plant to verify field tolerances, and trucked to an airport parking lot near the bridge. The segments were required to be onsite 24 hours prior to the start of demolition of the existing bridge. The contract specified high performance concrete for all concrete on the job.August 2005 Weekend:The Route 1 bridge over the Olden Avenue Connector was closed at 7 p.m. on a Friday, and traffic was rerouted onto a 5-mile detour. The bridge was demolished in place using conventional methods. The existing abutments were repaired and new bearing seats constructed. The prefabricated superstructure was then erected. The longitudinal joints between superstructure segments were grouted, primed, and coated with a polymer sealant. The expansion joints at the ends of the span were then completed. The cast-in-place parapets were connected to the outside segments with bars in threaded inserts. No overlay was applied. September 2005 Weekend:The Route 1 Southbound bridge over Mulberry Street was closed at 7 p.m. on a Friday, and traffic was rerouted onto a 5-mile detour. The construction methods and time required to replace this bridge was similar to the bridge over the Olden Avenue Connector. Parapets and median barriers were cast-in-place concrete. October 2005 Weekend:The Route 1 Northbound bridge over Mulberry Street was closed at 7 p.m. on a Friday, and traffic was rerouted onto off- and on-ramps. The construction methods and time required to replace this bridge was similar to the bridge over the Olden Avenue Connector. Parapets and median barriers were cast-in-place concrete. Each of the three bridges was allowed a 57-hour window from complete closure to re-opening of both lanes. If this window was exceeded, a lane occupancy charge would be assessed, up to $10,000 per day. Incentives were also included to encourage the contractor to minimize onsite construction time even further than 57 hours per bridge. For the bridge over the Olden Avenue Connector, an incentive of $1,500 per hour was specified if the work was completed in less than 57 hours, not to exceed a maximum of $27,000. For each bridge over Mulberry Street, an incentive of $2,000 per hour was specified if the work was completed early, not to exceed $36,000.Liquidated damages were also specified. The contractor would be charged $1,500 per hour if he took longer than 57 hours to open the bridge over the Olden Avenue Connector to traffic, and $2,000 per hour if he took longer than 57 hours to open either of the bridges over Mulberry Street. Also, the contractor would be charged $4,200 per day if the bridges were not substantially completed by November 16, and an additional $900 per day if all work was not completed by January 13, 2006.All three bridges were opened in less than the required 57 hours. The bridge over the Olden Avenue Connector was opened in 56 hours, the bridge over Southbound Mulberry was opened in 51 hours, and the bridge over Northbound Mulberry was opened in 54.3 hours. With all three bridges opened well before Monday morning rush hour, the contractor earned an $18,500 incentive.

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