2010 â?? I-93 Bridge over Loudon Road (Route 9)

Description

Meta Fields

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Project Location :

on I-93 over NH Route 9 (Loudon Road) at Exit 14 in the city of Concord

Mobility Impact Time : ABC: weekend closure (60 hours) to replace each superstructure - total 3-month construction period; Conventional: eight months
Impact Category : Tier 2 (within 3 days)
Dimensions : 82-ft long and 86.8-ft wide single-span steel girder bridge
Average Daily Traffic At Time Of Construction : 70000
Traffic Management : Traffic management alternative, if constructed conventionally: full temporary bridge or temporary bridge widening
Existing Bridge Description : The bridge consists of two adjacent two-lane superstructures supported by shared abutments. The bridge carries I-93 northbound and southbound over NH Route 9 (Loudon Rd) at Exit 14. Each superstructure has six steel girders at 7.5-ft spacing. Built in 1966, the bridge decks were deteriorated and required replacement.
Construction Method : The replacement of the southbound portion took place over a weekend in April 2010. Loudon Rd was closed to traffic at 7:00 pm. Southbound traffic on I-93 was then reduced to one lane and diverted to the northbound deck. The northbound deck carried two lanes northbound and a single lane southbound for half the weekend. Late Saturday night, that configuration was reversed to two lanes southbound and a single lane northbound for the remainder of the closure. Once the closure began, the existing deck and six steel girders were removed and new 3-ft-deep steel girders at 7.5-ft spacing were placed. Full-depth, full-width precast concrete deck panels were then set on the new girders. The panels were post-tensioned, and a cast-in-place closure pour was placed at each end of the span. Both roadways were returned to their original traffic configurations at 7:00 Monday morning, resulting in a 60-hour closure period. The northbound superstructure was completed during a similar closure over a weekend the following month, in May 2010. Construction to prepare the roadway for the traffic switch began prior to the closure utilizing night work. Also, the membrane and asphalt overlay were placed, bridge rail installed, and elastomeric bearings replaced outside of the closure period. The work outside the closure period was done during off-peak hours. The contract included a $100,000 No Excuse bonus if the contractor had all four I-93 traffic lanes reopened through the work area prior to Intermediate Completion Date #1. Also included was a $1,250 per full hour incentive that all Loudon Road traffic lanes were reopened within the project area prior to Intermediate Completion Date #1, with a $30,000 maximum. The contract included the same No Excuse bonus and incentive for Completion Date #2. In addition, the contract included a $40,000 No Excuse bonus for meeting the I-93 lane opening requirements described above for both Intermediate Completion Date #1 and Intermediate Completion Date #2. The maximum combined contract No Excuse bonus and incentive award was $300,000.The contract also included road-user cost disincentives that were to be assessed not as a penalty, but for added expense incurred by the traveling public. An unlimited disincentive of $3,750 was included for each full hour beyond Intermediate Completion Date #1 that all four I-93 traffic lanes were not reopened. In addition, an unlimited disincentive of $1,250 was included for each full hour beyond Intermediate Completion Date #1 that all Loudon Road traffic lanes were not reopened within the project area. The contract included the same unlimited disincentives for Completion Date #2. No upper limit to the dollar amount of the disincentive clauses was included in the contract.
Stakeholder Feedback : The original contract called for replacement of only the deck, completed during weekend closure, with existing girders repainted at night outside the closure period. The contractor value engineered a proposal to replace the girders. One of the driving considerations in his decision to replace the girders was that he would not need to be extremely careful with the deck removal; if he were to damage a girder that was to remain in place, the repair would be costly from a time perspective. The only major issue on the project was related to the grout for the post-tensioning ducts setting up faster than expected. Getting shear key grout to flow around the post-tensioning ducts was problematic, and was leading to some leaking. (See Lessons Learned below.) That resulted in delays, but both roadways reopened significantly ahead of schedule. The project was a complete success.

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