



2011 - Cedar Street Bridge (Wellesley)

Description

Meta Fields

Project Summary : 2-span replacement using self-propelled modular transporters (SPMTs) during a weekend closure. Precast abutment caps and pier cap on reused columns/foundation.

Project Location : Cedar Street (urban minor arterial) over Route 9 in the town of Wellesley, just west of the I-95/9 Interchange and west of Boston

Mobility Impact Time :

- ABC: One weekend closure (72 hrs); 30 days of night or off-peak one-lane closures on Rte 9
- Conventional: 24 months; two construction seasons

Impact Category : Tier 2 (within 3 days)

Dimensions : 83.08-ft-long and 53.33-ft-wide two-span continuous steel girder bridge roll-in (41.54 ft x 41.54 ft); 7° skew; 530-ton self-weight

Average Daily Traffic At Time Of Construction : 12184

Traffic Management : extended use of detours through city streets

Existing Bridge Description : Built in 1932, the existing 2-span, 2-lane steel girder bridge was structurally deficient and had a minimum vertical clearance of 13.75 ft. The superstructure was in poor condition and needed to be replaced, but the pier and abutments could be repaired, adjusted, and reused.

Replacement Or New Bridge : The replacement bridge has three traffic lanes, one in each direction with a left-turn-only lane in the southbound direction. There is a 6-ft-wide sidewalk on the east side of the bridge and a 5-ft-wide sidewalk on the west side. The 2.17-ft-deep cross-section consists of 8 steel girders (W14x159) at 6.75-ft spacing with 8-inch-thick composite cast-in-place concrete deck and 3-inch-thick hot-mix asphalt (HMA) wearing surface. To avoid future truck collisions, MassDOT increased the bridge's vertical clearance to 15 ft.

Construction Method : The contractor built the replacement bridge on temporary shoring towers on site within the east cloverleaf ramp north of the bridge. At 10 pm on Friday, July 1, Cedar Street and Route 9 within the work area were closed and traffic detoured. The contractor demolished the old bridge and erected new precast abutment caps, a new precast pier cap, and elastomeric bearings. At 5 am Sunday, four lines of self-propelled modular transporters (SPMTs) moved the superstructure from the cloverleaf onto the Cedar Street ramp and down the ramp onto Rte 9, arriving at the pier and abutments at 9:30 am. The SPMTs lowered the bridge into position early Sunday afternoon. Precast approach slabs were installed. The contractor then worked to put temporary lane markings in place and open one sidewalk for pedestrians. The bridge and Rte 9 were reopened at 12:00 pm noon on Monday, July 4. The holiday weekend was selected due to historically low traffic volumes. The remaining work, including installation of architectural pilasters and completion of sidewalks, was done subsequently during off-peak hours. A membrane system was applied to waterproof the deck prior to moving the bridge. Five windows were left in the membrane to monitor for cracks during and after the bridge move. After the bridge was moved, the five windows in the waterproof membrane were covered and the HMA wearing surface was applied. There were four milestone incentives/disincentives used for this contract. Milestone 1 involved having all construction plans approved, the bridge fully constructed in the clover leaf and ready for the move, all traffic management plan measures in place and ready for deployment and the SPMTs on site by July 1, 2011. A \$50,000 incentive / disincentive was associated with this milestone. Milestone 2 was demolishing and replacing the Cedar Street Bridge on the 4th of July weekend within 72 hours. There was a \$2,500 per hour incentive / disincentive to a maximum of \$150,000. Milestone 3 was substantial completion by July 20, 2011 for a \$50,000 incentive/disincentive. Milestone 4 was Final Acceptance by August 20, 2011 for a \$50,000 incentive / disincentive. This milestone was revised to allow only the evergreen trees to be planted by September 30, 2011 for the evergreen planting season fell after the August 20, 2011 date, although all other parts of this project were still to be completed by August 20, 2011.

Stakeholder Feedback : Feedback from local residents and stakeholders was very positive, due to maintained mobility during construction and strong education/outreach prior to the move weekend.

High Performance Material : High performance concrete (HPC) deck

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