



2019 ?? Shaler Street Bridge

Description

Meta Fields

Project Summary : This project was the first time that Self-Propelled Modular Transporters (SPMTs) were used by PennDOT to replace a bridge, and was considered a pilot project.

Project Location : Shaler Street over SR 19 (Saw Mill Run Blvd) near the city of Pittsburgh in southwest Pennsylvania

Mobility Impact Time :

- ABC: 71-day closure of Shaler Street; two weekend closures of SR 19
- Conventional: approximately 6-month closure

Impact Category : Tier 5 (within 3 months)

Dimensions : 34.42-ft wide, 140-ft long two-span (70 ft × 70 ft) steel plate girder bridge, 5° skew, 14% profile grade

Average Daily Traffic At Time Of Construction : 27000

Traffic Management : There would have been an additional 4-month closure of Shaler St if ABC was not used.

Existing Bridge Description : Built in 1949, the existing structure was a 162-ft-long, three-span (60 ft - 56 ft - 42 ft) bridge with a 24-ft-wide roadway and two 6-ft-wide sidewalks. It climbed at a rate of 14% grade over SR 19.

Replacement Or New Bridge : The new bridge is a 140-ft-long, two-span (70 ft each) continuous-for-live-load steel plate girder bridge. It is 34.42-ft wide with a 26-ft roadway and one 5.67-ft sidewalk. The superstructure cross-section consists of five Grade 50 steel plate girders with a reinforced concrete deck. The substructure consists of cast-in-place concrete abutments and interior pier founded on drilled caissons.

Construction Method : During preliminary design, PennDOT had multiple discussions with heavy move contractors to explain the scope of the project and complications of the project site to confirm that an SPMT bridge move was feasible. They developed a 3D finite element model to analyze dynamic effects during the move and determined tolerances. They evaluated the move path for horizontal clearances and grade changes. With this project being their first SPMT bridge move, PennDOT wanted to make sure their intent for the project was clear to the contractors who would be bidding on the project and to the construction inspection staff. They decided to provide conceptual construction sequence plans and conceptual plans for the bridge move path and bridge staging area, with the intent that the contractor could have flexibility to do what worked best for them. They also developed an animation to show how they envisioned the bridge construction and move; this was also shared with the media and general public. The two new spans were built at the final 14% grade on temporary supports in an adjacent staging area approximately 500 ft from the bridge site. Abutment #2, the uphill abutment, was constructed under the existing bridge prior to bridge closure. Only portions of Abutment #1 could be constructed prior to bridge closure due to site constraints. The existing bridge was closed and demolished during the first weekend closure of SR 19 (September 6-8, 2019). The contractor changed the precast cheek walls and precast interior pier to conventional cast-in-place concrete construction. The abutments and pier were completed after the bridge was demolished. During the second weekend closure of SR 19 (November 3-5, 2019), the coarse-aggregate move path with maximum 4% grade was constructed. The two new spans (each weighing approx. 260 tons) were moved individually from the staging area into their final positions using a single set of SPMTs. The temporary grading was removed prior to opening SR 19. A continuity connection was provided over the pier to make the spans continuous for live load. Shaler Street was closed for a total of 71 days (September 6 - November 22, 2019). The special provisions for the project required that SPMTs be used for installing the new superstructure; this was also discussed at a pre-bid meeting for the project. In addition, PennDOT provided extensive public outreach coordination throughout the project.

Stakeholder Feedback : Lessons Learned:

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- Require submission of a stakeout plan for the new superstructure in its temporary location.
 - Maintain contact between jacking falsework and the superstructure until final position is achieved.
 - Oversize the anchor bolt hole locations, or set the bridge and then drill the anchor bolt locations.

