



2013 - Milton-Madison Bridge

Description

Meta Fields

Project Summary : Lateral slide of 2,430-ft-long, four-span truss superstructure

Project Location : US Route 421 across the Ohio River between the towns of Milton in Kentucky and Madison in Indiana

Mobility Impact Time :

- ABC: two closures (approx. 5 days each)
- Conventional: one year

Impact Category : Tier 3 (within 2 weeks)

Dimensions : 3,200-ft-long and 40-ft-wide steel through-truss bridge with four river spans (599 ft - 600 ft - 727 ft - 500 ft); prestressed concrete approach spans Kentucky (71 ft - 90 ft - 92 ft - 114 ft); prestressed concrete approach spans Indiana (112 ft - 117 ft - 117 ft)

Average Daily Traffic At Time Of Construction : 10700

Traffic Management : Conventional construction would have required up to one-year use of 26-mile detour to the nearest bridge upstream, or 46-mile detour to the nearest bridge downstream; a ferry service would have been provided during the closure.

Existing Bridge Description : The existing five-span steel through-truss bridge with approach spans is 3,181 ft long and 20-ft curb-to-curb width, with concrete substructure. It has two 10-ft-wide traffic lanes and no shoulders or sidewalks. The bridge had two abrupt grade changes of 5% causing substandard sight distance issues and two horizontal kinks in the approach geometry. Built in 1929 and with its last major rehabilitation in 1997, the structurally deficient and functionally obsolete bridge was load posted at 15 tons in 2009 and lowered to 3 tons in 2012, and required replacement. The project is a joint effort between the Indiana Department of Transportation (INDOT) as the lead and the Kentucky Transportation Cabinet (KYTC).

Replacement Or New Bridge : The replacement bridge has two 12-ft-wide traffic lanes, two 8-ft-wide shoulders, and a 5-ft-wide sidewalk on the downstream side of the bridge. The cross-sections consist of a steel through-truss on the four river spans, and precast concrete beams on the approach spans. The entire structure has an 8-inch-thick cast-in-place concrete deck. The existing concrete piers in the river were rehabilitated, and the approach span substructures were replaced conventionally.

Construction Method : Construction at the bridge site began in November 2010 with the strengthening of the existing river piers while traffic was maintained on the existing bridge. Cofferdams were built around the base of the river piers to allow access to the unreinforced caissons the existing piers are built upon. The piers were then strengthened to accommodate the new wider pier caps and bridge. As part of the strengthening process, the existing unreinforced caissons were cored into to allow for the placement and grouting of steel reinforcement bars. Steel reinforcement bars were placed the full length of the pier stems, and then the piers were encased in two feet of high-performance concrete (HPC). After the pier encapsulation was completed, the cofferdams were removed and scour countermeasures were installed around the piers. The scour countermeasures include geo-textile fabric and a special graded rip rap aggregate placed around the pier. Concurrently the temporary steel towers to support the new bridge in the temporary configuration were constructed adjacent to the existing bridge on the downstream side. The temporary approach ramps at both ends of the existing bridge were constructed and connected to the existing structure during the first bridge closure. On the Milton side of the river, a trestle work platform was built, extending into the river to create access for barges. Two of the new truss spans were assembled on the barges. To quickly provide materials to barges for work in the river, the contractor built a causeway on the Madison side of the river using sheet piles and aggregate backfill. The new truss spans erected on barges were then floated into place between the temporary towers adjacent to the existing bridge and lifted to the top of the temporary towers using hydraulic strand jacks. The other two truss spans were built by conventional stick build/cantilever construction. After all four river spans were erected onto the temporary towers, the concrete deck was cast and the sidewalk and railing constructed. Traffic was detoured and the bridge was closed to connect the temporary approach ramps in Milton and Madison to the existing structure. This was the first of two closures proposed by the contractor. The work to tie in the temporary approach ramps to the existing structure was completed in four days. The second bridge

Contact Us | Phone: (305) 348-0110 | Email: abc@fiu.edu | 10555 W. Flagler Street, EC 3680 Miami, FL 33174

