

**February 2020 ABC-UTC Webinar Featured Presentation: Tennessee DOT's I-240 MemFix4 CM/GC ABC Project**

#	Questions	Responses
<b>Design</b>		
1	Can final plans for the bridges be provided to attendees?	Yes. The plans are available on the ABC-UTC "Monthly Webinar Archives" web page for this presentation (below the link to this pdf).
2	Did the agency specify the ABC installation method (cranes, slide-in, SPMT, etc.) or allow the contractor to select?	TDOT developed initial concepts in a technical study to provide intent and feasible options. Using this and their own ideas, the contractors proposed concepts during the CM procurement phase. The design phase used these ideas as the starting point for the design process.
3	How does seismic affect steel fabrication?	Seismic affected our steel design, and has some effect on detailing (connection types, hole sizes, etc.), but otherwise did not have a significant effect on the fabrication in this case.
4	How was the adequacy of the existing structures determined, especially for the foundations?	The existing structures continued to perform as normal during the project. The stability of existing substructures was the main focus during the new substructure work in advance of ABC phase of the project. New foundations immediately adjacent to existing spread footings were supported by micropiles, and excavations limits were set to prevent undermining of the existing footing elevations.
<b>Construction</b>		
5	Were there any issues with the coordination with the railroad, and how far in advance did the coordination start?	There were no issues, but there was a process with many steps to be followed. The project received input from NSRR starting with the technical study at the beginning of the project. Communication was frequent and included numerous meetings, emails, and submittals both by the design consultant and the contractor.
6	What is a micropile?	A micropile is a drilled pile which typically consists of a "bond zone" where grout bonds to the soil, and a "cased zone" near the ground surface which primarily provides lateral strength. Micropiles can be installed using small rigs, making them ideal for sites with limited space.

<b>Cost</b>		
7	What were some of the new technologies used on this project, and the cost?	For TDOT, this was the first widespread use of micropiles in a high seismic zone. The ability to install the piles in a constricted space was the primary driver for using this system. The average cost for the installed system was \$125 per foot.
8	What is the cost of Maintenance and Protection of Traffic on this project ?	Some items, such as barrels, signs and barrier rail, are paid at a unit costs. However, the overall traffic control is a lump sum item. Traffic control was a major cost on the project, but reducing the I-240 lane closure to less than 1 year and the overall duration by 18 months was a major win for the safety of the crews and traveling public. It is hard to put a price on the value of the safety gained from utilizing weekend closures to perform significant aspects of the work.
9	What was the cost of the CM (Construction Manager) part of the CM/GC? (How much was the construction manager paid?)	During the CM procurement, qualifications and a proposed fee were submitted during the selection process. For this project, the CM's fee for the design phase was \$250,000.
<b>Questions during Webinar</b>		
10	Did the designer have involvement with the selection of the Contractor, or was that decision made solely by the owner?	The selection of the CM and the design consultant was solely the responsibility of the Tennessee Department of Transportation.
11	Given the CM/GC process, how was coordination developed and conducted with 3rd parties (e.g., NSRR)?	Project stakeholders, including NSRR and utilities, had frequent seats at the table during the CM/GC design phase. Frequent emails and submittals provided feedback to the design team.
12	Since the CM was brought in almost 1 year after the design was started, was the CM able to provide input that resulted in design changes, or did the CM basically just follow the original design ?	The CM was brought to the design phase at the beginning of the project when only 10% of the design had been conducted. This 10% included developing survey, geotechnical data, existing bridge layouts and preliminary roadway plans to serve as a point of beginning.
13	What was the cost per linear foot for the micropiles?	\$125/linear foot.

14	Slide 22 - Did you consider installing abutment-space boxes with removable lids in which the abutments could be built, i.e., lids on for traffic but removed for pile driving or other abutment work?	Many ideas were considered. The excavations were shallow to reach the buried elements, meaning not much time was required. There was plenty of time to complete the work over two weekends. Using fill and asphalt to cover the work was stable and simple.
15	Did you have to grind the closure pour surface?	No. It was a little rough in a few limited areas, and it was only temporarily exposed to traffic. The final asphalt overlay provided a smooth riding surface in the end.
16	Was the space between the back-to-back channels between the two half railway bridges filled or sealed at the end?	The channels protected the deck plate joint that was bolted up after the final slide weekend. Once the bolts and waterproofing membrane were installed, ballast stone was placed in the void and the channels were removed similar to removing a trench box.
17	Was there a breaking system on the slide mechanism? And was it needed?	No. The slide system utilized a stainless steel/Teflon pad system that provided sufficient friction to allow controlled movement.
18	I noticed there were bars that appeared to be epoxy coated that needed to be bent down into the link slab in the field after placement of the units. How did you ensure there would be no damage to the epoxy coating on those bars during field bending?	It is our experience that the epoxy coating is able to withstand this amount of bending without compromising the coating. As a practice, we do not allow for hard bends which could prove to be problematic to the coating.
19	Did the GC lay the track, or was that coordinated with the NSRR? If the latter, how did that work?	NSRR subcontractor laid the track under NS supervision. Scheduling was worked out by TDOT and the GC during the construction phase. Slide weekends were coordinated to have NS track crews and contractor on site to ensure the connections were made.
20	Was the RR bridge raised to increase vertical clearance?	The vertical clearance above the roadway was improved by more than a foot to be slightly above TDOT's minimum interstate clearance of 16.5 feet. The bridge was at the low point of a vertical curve which allowed for a simple grade raise on the railroad without impacting their operation.
21	Did you have any issues with sliding the railroad bridge segments over? If so, how did you handle it?	Overall the slide weekends went as planned with the exception of a delay the first weekend in clearing the temporary anchor bolts. For the second weekend, the bridge was jacked slightly higher to avoid the clearance issue the contractor had to overcome the first weekend.

22	Were there special curing requirements for the high-early strength concrete?	No special requirements outside of the requirements of the TDOT Standard Specifications.
23	Is Tennessee going to actually compete for the Eastern Division this year?	Input from several sources was obtained; however, no definitive answer could be drawn from these conclusions. Preference trended towards 'lighting a candle' rather than simply 'cursing the darkness.' I can assure you the words of Abraham Lincoln ring true on this topic: "Better to remain silent and be thought a fool than to speak out and remove all doubt."