November 2021 ABC-UTC Monthly Webinar: Arkansas' ABC & First Lateral Bridge Slides		
#	Questions	Responses
1	How much contractor engagement occurred before the letting, and how prescriptive were the plan drawings for the temporary structures and move sequencing?	Concerning Contractor engagement before the letting, in November 2018 (approx. 7 months pre-letting), Finn Hubbard and ARDOT hosted an ABC presentation for AGC-Arkansas. The presentation wasn't specifically about this project, but this project had a few slides within the presentation. In addition, the project had a longer advertisement period (8 weeks in lieu of the normal 4 weeks). During this extended advertisement, Contractors were allowed to ask questions. Regarding the plans for the temporary structures and slide system, they were kept as flexible as possible given the Design-Bid-Build project type. The temporary structures were shown schematically, and the Contractor did the final design. The contract plans gave allowance for both a PTFE / stainless steel slide surface, as well as a Hillman-type roller. The slide powering system was left for the Contractor to design to best fit their preferred means and methods.
2	Please address if, and to what extent, the design stage and plan preparation activities were subjected to peer review.	The design and plans were reviewed by multiple groups in the company, as well as typical plan reviews by ARDOT.
3	What specifications controlled differential movement of the bridge ends during the slide?	The Lateral Slide Special Provisions and the Contractor's slide plans dictated the tolerances. The monitoring system was set to provide warning if the two bridge ends were 2 inches out of sync. An "All-stop" would be signaled if the ends were 4 inches out of sync.
4	Can you speak about earthquakes and bridges, and what measures were taken for this project?	The project is located in Seismic Zone 1 and it's a single span bridge, so no seismic design was required.

5	How much did the ABC option cost compared to conventional construction? How did the final cost compare to the estimated cost?	The total Project Cost was $12.7M bid. The Bridge Cost was $400/S.F. bid vs. ~$200/S.F. for non-ABC. The biggest discrepancy was in the temporary falsework, jacking, and lateral slide costs. This was likely due to uncertainties with the first time use in Arkansas.
	Questions during Webinar	
6	Slide 8 appears to show a bolt-on rail. Is that a tested rail?	No, this is not a crash-tested rail. It is used infrequently, on low volume routes, typically county roads.
7	Slide 18 shows 120 days for bridge replacement and 20 days for box culvert replacement. Doesn't the 20-day box culvert replacement requirement pretty much dictate precast units?	Yes.
8	Is there any limitation for the bridge span length and weight for using the lateral slide construction method?	The lateral slide method has been used on many "typical" highway bridge structures as well as the Milton-Madison Bridge replacement, which was a large multi-span continuous truss crossing the Ohio River. My understanding is that the lateral slide method is "doable" for most typical bridges. I would expect other considerations such as cost, traffic demand, site conditions for staging, etc., would also play into the decision to use the lateral slide method.
9	Were there any issues with "bounce" during the pulling slide (overcoming static friction versus strand sag)?	We did observe some slight "bounce" during the Bridge A lateral slide, for which it seemed to take more force to overcome the static friction. The Bridge B slide moved almost immediately and more smoothly when the jacking force was applied. In both cases, the movement was controlled, within the required limits, and the Contractor never had to reverse direction. The bridge was designed for this case of "slip" and the resulting force on the substructure.
10	How did the contractor maintain the longitudinal alignment during the lateral slide? Did they need to make longitudinal corrections?	The lateral slide system utilized a guide system installed at one end of the bridges to prevent the structures from "walking" longitudinally during the slide. The system worked, and no corrections were needed.

11	What mechanism was used to lock the abutments longitudinally?	The design employed concrete restrainer blocks at one end of the bridges to provide a "fixed" condition.
12	How did the replacement bridge design account for the possible asynronization during the lateral sliding process? Did you consider a certain lagging between both bents? What was the estimated lagging, if any?	A Bridge Move Plan was developed by the Contractor / Subcontractor that set the "out-of-sync" limitations during the slide. During the slide, the position at each bent was constantly monitored by tape measure and radio communication. Also see the response to Question #3. Since this particular structure type is a single-span bridge supported on a low-friction slide track, there was a reduced concern with deformation of the superstructure during the slide (as opposed to a multi-span continuous slide where differential movement at the supports would induce deformation in the superstructure).
13	Can you restate how much traffic downtime was associated with this project?	The short-term closure for each bridge slide was 8 days. This was the portion of the project where traffic was set head-to-head (one lane in each direction).
14	To expedite the construction process, were precast approach slabs considered as an option in lieu of high-early strength concrete for the approach slabs?	Precast approach slabs were considered, but it was ultimately decided to construct the approach slabs using high-early strength concrete.
15	What was the final total construction cost?	The winning bid price was $12.7 M.
16	What was used for the sliding in terms of materials? Also, what was the friction factor (lubricated)? Was there any guiding system used during the sliding?	The Contractor elected to use a PTFE slide track mounted on the end bents in combination with stainless steel plates installed on the underside of the end concrete diaphragms. The friction factor assumed in the Subcontractor's Lateral Slide Design was 0.18. A guide system was installed at one bridge end to prevent the bridge from "walking" longitudinally during the slide. Also see the response to Question #3.
17	Did the contractor have previous bridge slide experience prior to this job?	Yes, the Contractor had previously performed a lateral bridge slide for the Oklahoma DOT, and the Bridge Slide Subcontractor had been involved with multiple slide/move projects.

18	How was the lateral slide synchronized at each bent to ensure that the bridge moves at the same rate at each bent?	A Bridge Move Plan was developed by the Contractor / Subcontractor that set the "out-of-sync" limitations during the slide. During the slide, the position at each bent was constantly monitored by tape measure and radio communication. Also see the response to Question #3.
19	Can you explain / elaborate the need for vertical jacking within the pockets?	The "Jacking Pockets" formed in the end concrete diaphragms are required to provide enough vertical room to use the hydraulic jacks to lift the bridge on and off of the slide track. They were approximately 6 inches high, were accessible on the "open" side of the diaphragm but did not extend all the way to the backfill side.
20	How may bidders did you have, and what was the spread in the contractor's bids?	The Contract had 2 bidders. The winning bid was $12.7 M, and the other bid was $18.8 M (48% increase).
21	How much camber was built into the permanent lower cap, and were there any fit-up issues with the bridge cap?	No camber was built into the caps as deflection estimates were very low. There were no fit-up issues between the superstructure and the substructure.
22	Can you expand your explanation on the "guide system"?	The guide system consisted of steel plates attached to the end concrete diaphragm at one bridge end. These plates overlapped the PTFE slide track and prevented the superstructure from "walking" longitudinally during the slide.
23	Were the straddle bent caps for I-30 conventionally reinforced or prestressed?	The straddle bent caps were conventionally reinforced.
24	On slide 18, the Mississippi County bridges are in a high seismic region. How and what type of connections were used for the seismic loads? Can you provide any references for the use of the connections in high seismic regions?	The intermediate pile bents utilize concrete-filled steel shell pipe piles. To provide for capacity protection of the bent caps, the steel shell piles were terminated just below the bottom of the cap and the vertical reinforcing within the concrete-filled core were extended into corrugated metal pile (CMP) pocket connections. Therefore, the flexural demand at the top of the pile was accommodated by a conventional reinforced concrete column section. The CMP section provided the required joint reinforcement and confinement. Provisions outlined in the LRFD Guide Specifications for Accelerated Bridge Construction were used to size the corrugated steel pocket connections.