ABC-UTC September 2023 Monthly Webinar: Five Million Pound Utah Bridge Slide		
#	**Questions**	**Responses**
1	What were the governing criteria that were used to advance this bridge replacement as a lateral slide?	The design-build criteria included a user-cost-based lane rental cost to be included in the bid. For instance, to close 1300 East the design builder would have to include a cost of $150,000 per day. The cost was a factor in the best value selection; therefore, minimizing the lane rental cost minimized the amount of the bid.
2	What design wind loads were applied to the temporary structure, and how were the sliding loads modeled and applied to the temporary structure?	Wind loads were considered negligible for the temporary structure. The soil pressure was controlling horizontal forces on the temporary structure. The sliding loads were considered as a moving load from the temporary condition to the final condition considering the largest resulting forces.
3	Can you please detail the benefits of using structural lightweight concrete in this type of bridge construction?	Lightweight concrete is not necessarily a benefit to a bridge slide.The benefits of lightweight concrete were considered as they would be for any type of bridge design and construction.
4	Does the weight of the structure matter that much for a slide? Was using lightweight concrete that beneficial?	The weight of the structure is of less importance to the bridge slide as high capacity of hydraulic jacks are available. Lightweight concrete may provide advantages in other elements of the structure, but the slide is not a driving factor.
5	What are the benefits of designing with structural lightweight concrete meeting ASTM C330? Was the reduction in deck weight a benefit?	The lightweight concrete (AASHTO M195) reduced the weight of the bridge to benefit the substructure design and reduce bearing pressure forces. The total reduction in load for all the lightweight superstructure components was roughly 655 kips.

6	Can you speak on design tolerance requirements from the Utah DOT, specifically between adjacent slide shoes and any other considerations?	The goal for the final position of the bridge is that it is no different from any other bridge. We did modify construction elements to provide a means of meeting tolerances for ride quality. For instance UDOT requires, and we provided, an addtional 1/4 inch of concrete above the top rebar on approach slabs to accommodate grinding to achieve good ride quality transitions from roadway to bridge. As described in the presentation, we planned up to one inch or additional rebar cover and a small cast-in-place portion of the sleeper slab stem wall to accommodate some longitudinal bridge movement while still providing a gap for our strip seal expansion joint. Laterally we provided a gap between the cheekwall and the abutment end diaphragm to be a minimum of 1/2 inch and a maximum of 1 and 1/2 inches.
7	What kind of means and methods did you use to monitor any twist, deflection, or geometric discrepancies?	As shown in the presentation, we had a survey stake at the centerline of the abutment diaphragm and a metal tape attached to the centerline of the stem wall. With each stroke of the jacks, we could visually measure horizontal movement and alignment. We had elevation benchmarks on the deck to monitor elevation changes at the deck level. With a lateral slide using two points per abutment, the forces at each slide bearing were constant and the slide surface was level. By controlling these factors, the bridge did not experience twist or additional deflection during the slide.

8	How did the slide project cost compare to conventional construction costs?	As a very general rule, adding $500,000 to the cost of conventional construction would be a starting point in considering a bridge slide for a typical one- or two-span bridge. Cost increases are largely impacted by design and construction of the temporary support locations. There is some additional design cost for details specific to the slide. There is the cost of the slide equipment (jacks, bearings, slide shoes, slide rails/rods) but these are not major. Actual construction costs and productions are equal or possibly less than conventional construction when considering traffic control setups, ability to work outside of traffic and being less constrained by weather or working during off-peak traffic hours. A key component in evaluating the true "cost" of a slide is the user cost the owner assigns to traffic impacts.
	Questions during Webinar	
9	Since the new bridge is a single span, what is the new superstructure depth versus the old multispan bridge superstructure depth?	The existing superstructure depth was 5 ft-4 inches, and the new superstructure depth is 6 ft-3.6 inches. The difference between the two structure depths was made up by the vertical curve.
10	What type of structural steel was used for the bridge girders?	The structural steel was AASHTO M270.
11	Can you describe a bit more about the cover (joint behind the end diaphragm and abutment) that protects the bearing from the backfill? Was a waterproof membrane also part of the system?	The joint behind the end diaphragm and abutment had a 3/16-inch galvanized steel cover plate that extended along the entire width of the bridge and was connected to the end diaphragm with anchors spaced every two feet. The plate extended six inches below the top of the abutment stem. A waterproofing membrane was placed over the plate, and extended one foot beyond the plate on the abutment stem and end diaphragm.
12	Can you describe how the bearing locations under the diaphragm (rather than traditional bearings under the girders) were considered for load transfer from the superstructure to the substructure?	The bearings under the diaphragm follow a semi-integral design.

13	What is the estimated settlement for the spread footings?	Estimated settlement is between 3/4 inch and 1 inch.
14	Can we get a copy of Utah's ABC decision-making tool? The website link requires permission to view it.	The UDOT ABC Decision Making Tool website link has been fixed: https://www.udot.utah.gov/connect/business/structures-geotechnical-guidance-manuals/#:~:text=ABC%20Decision%20Making%20Tools,an%20ABC%20approach%20is%20required (Note: Click "ABC Rating Procedure Spreadsheet and Decision Flow Chart (0.12 MB)" to download the Excel file.)
15	Did the Utah DOT mandate that the partial sleeper slab be cast-in-place concrete, or was this the Contractor's risk mitigation decision?	This was a contractor mitigation decision specifically made for this structure. It had not been done on previous slides. We would recommend that this method be considered on a case-by-case basis for future slides.
16	Why does the bridge need to be slid? It looks like there is plenty of right-of-way (ROW) to realign the roadway to a new bridge.	The road could not be realigned due to ROW constraints.
17	Was the dust from the demolition a major issue on this project?	Dust mitigation was an issue. Dust was controlled by spraying water on the structure during demolition.
18	Are incentives and disincentives a Utah DOT standard practice? What are your thoughts on their effectiveness when used together?	The use of incentives and disincentives for UDOT is a project-by-project decision. Project teams determine when to use incentives and disincentives and the respective amounts.