Slide IT	**Updated: 5/15/14**

Webinar Q&A Documentation
Slide In Bridge Construction (SIBC) Construction/Contractor Perspective - March 6, 2014

No.	Questions Submitted in Q&A or Chat Box During Webinar	Q&A Panel Responses See also the new SIBC Implementation Guide; downloadable at http://www.fhwa.dot.gov/construction/sibc/
1	What was driver for deciding to slide vs. roll? Overall weight?	We wanted to meet the project goal of evaluating innovation and different types of innovation, so we opted to roll one and slide the other. Either method could have been used at either bridge or both bridges. We used the slide on the steel girder bridge because it was easier to attach the discrete skid shoes to the steel girders. The prestressed concrete bridge had adjacent box beams and using rollers and a lifting beam seemed like a reasonable approach on that bridge. Weight was not too much of a driver either way.
2	1. Why the two different slide methods? 2. How much experience should your contractor have to perform the slide work? Do you recommend an experienced subcontractor to perform slide work?	1. CDOT was using this project to test methods and find innovative solutions to be used on future projects. 2. The amount of experience should depend on the size and complexity of the project. Also, the SIBC Implementation Guide discusses some sliding methods that use a proprietary slide and track system may require the specialty subcontractor to operate. However, there are also very straight forward sliding options, such as used on these projects, that can be implemented and operated by the general contractor. A specialty sub may add cost to the project, but that cost must be weighed against possible risks and the comfort level of the GC to perform the slide.
3	What was the time from NTP to material procurement? What was the time from shop drawing approval to erection?	This project had a preconstruction contract and a construction contract. There was a focus on identifying the long lead procurement items early in the design process and to have the design completed for those items at the 60% design level. Those materials were ordered during the preconstruction contract to not delay the start of the project. The shop drawing approval to erection time was two months.
4	Could you use the Slide Technology for a multiple span flat slab bridge?	SIBC has been used successfully on several bridge types and should be able to be used for a flat slab bridge.

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5	Were the bridges a semi-integral or integral abutment in the final configuration?	Once we got to the permanent location, the girders were anchored down so the abutments functioned as fully integral. For the prestressed concrete box girder bridge, two items anchored the superstructure: 1) Vertical dowels installed in sleeves through the girders and abutment 2) a closure pour between the superstructure backwall and the abutment backwall. The vertical dowels were grouted in place and the closure pour used a quicker setting concrete. For the steel girder bridge, we used anchor bolts to secure the girders to the abutments. Four anchor bolts were used at each end of each girder. These were grouted in to place.
6	You mentioned filling in the space between the abutment and bridge end diaphragm. What was done to accommodate temp & shrinkage?	This space was filled with concrete with the intent of making an integral connection. Also, something must be done to "bridge the gap" for a continuous roadway.
7	In one of the bridges it appears that you were filling the gap between approach and bridge with concrete or grout. Also you have anchors grouted through. So, what is the end condition of the span? Are both ends fixed similar to Integral abutment?	The goal was to have fixed ends at both ends of the bridges, thereby functioning like an integral abutment.
8	My understanding is that the abutments were built in front of the old abutments. How did you handle the conflicts between the new and old abutments?	The new abutments were built behind the existing abutments making the new structures longer than the existing bridges. This was accomplished by building the new bridges in the temporary location, building a detour that put traffic on the new bridges. This configuration allowed the old structures to be demolished and the new substructure to be built without interference.

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9	Explain how you transferred the bridge onto the abutment and how was the falsework removed?	The bridge was jacked up using a series of 100 ton jacks. The falsework was unbolted and pulled out from under the bridge using an excavator. Essentially, we jacked up the bridge off the rollers and then pulled out the jacking stands, placed the bearing pads, then lowered the bridge down onto rollers. We then pulled the bridge into place, then jacked it up again (using the four 100 ton jacks on each abutment), pulled out all the blocking and jack stands, then lowered it down.
10	Was any consideration given to using temporary steel bents to support the bridge in its temporary location instead of cast-in-place concrete temporary abutments?	Other temporary abutments were considered but building the same abutment full length was more economical and easier to manage in the short project duration.
11	How much clearance was allowed for between the abutment and the superstructure?	The Fort Lyon bridge which was pulled into place on rollers had a 4" gap. The Holbrook bridge that was slid on PTFE had a gap of 2.5".
12	Please touch on why the diagonal bracing was needed.	The bridge had a longitudinal grade and there was concern it would want to rack or lean toward the lower end when raised on the lifting beams. There was considerable discussion in the design and bridge task force meetings, and we went with the route of an ounce of prevention is worth a pound of cure. Even with the diagonal bracing in place, the bridge did rack a bit toward the downhill side. Values were not measured, but the stirrups on superstructure backwall began to rub against the abutment backwall. Fortunately the stirrups were in such a configuration that they acted like skids.
13	Do the rollers have a different breakout force than the sliders?	This topic is discussed in the SIBC guide and corresponds to the experience on this project. In general, the Teflon pads have a higher initial breakout force, or static coefficient of friction, than the rollers do.

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14	Does the bridge roll easily even if the guide rollers end up riding along the guide channel flange? How much care is taken when aligning the guide channels? What is the tolerance on straightness?	The guide rollers did roll easily. The alignment of the guide channel was very important. The tolerance was 1/2" over the entire length of the channel.
15	Did you have stainless steel on the underside of the bridge with the Teflon?	The underside of the bridge was only PTFE on the bottom of the skid shoe.
16	The channel opening was reduced. Were the hydraulic requirements satisfied?	The steel girder bridge (Holbrook; the one that was slid) incorporated a longer span and did not constrict the channel. The prestressed box beam (Ft. Lyon; the one that was rolled) incorporated a span that was four feet shorter than the existing. This was permissible because the existing bridge had approximately 10 feet of span longer than necessary for hydraulic requirements. Canal companies are very sensitive to their ditches and prefer a uniform cross section along the entire canal length (often 10's of miles). The final canal cross sections match what was both upstream and downstream of the bridges and did not constrain hydraulics.
17	Was there any lubricant added to the rolling system or did the Hillman rollers roll smoothly in the channel without any lubricant?	The channel was not lubricated and the rollers were new with factory applied lubricant so they were not lubricated.
18	How much friction was there during sliding and rolling?	There was very little friction. The rollers moved freely and the inverted channel was kept clean of dust and debris. As far as the PTFE, there was soap put down as a lubricant and it slid very easily. (Also see answer below.)
19	Any estimate of how much of a difference there was in the friction/resistance to moving between the sliding and rolling methods?	While pressure gages were attached to the various jacks and pumps, the values were not recorded or ever translated into associated forces.

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20	Please elaborate on the methods for monitoring movement	The movement was monitored with tape measures and constant communication between the jack operators. The gaps between the bridge and the backwall were monitored as well.
21	Can you elaborate on the cable/winch system that you thought would work better to slide the bridge and how you would control the movement side to side.	I think the methods used on this project offered the most control and worked very well. The winch method may be a more cost effective way to move some bridges. For the Ft Lyon Bridge I would use the same track system for the rollers and use a winch instead of a doughnut jack and rod. For the Holbrook bridge I would use the same guide rollers and operate the winch slow enough to be able to monitor translation of the bridge.
22	How did you work out unforeseen issues (i.e. who pays) once construction began?	Any out of scope changes were handled by force account.
23	Can you add a note on additional substructure costs incurred?	We did not estimate the project for conventional bridges so the cost difference is unknown.
24	What is the anticipated cost difference between this type of accelerated bridge construction and conventional bridge construction?	We did not estimate the project for conventional bridges so the cost difference is unknown.
25	How close to original estimates and schedules at the 30% level did the final costs and schedules come to?	The project stayed within budget.
26	Did Kiewit prepare a cost estimate of a conventionally built bridge verses the cost a lateral move bridge?	We did not estimate the project for conventional bridges so the cost difference is unknown.