ABC-UTC September 2021 Monthly Webinar: Idaho's ABC Multi-Span Bridge over Snake River Replacement Project		
#	Questions	Responses
	Design	
1	Were there any permitting requirements that created challenges for use of ABC methods?	The permitting requirements did not create challenges for use of ABC methods.
2	Did the EOR (Engineer of Record) evaluate the construction loads on the existing structure, or did the Contractor's Specialty Engineer perform the analysis?	The EOR (Engineer of Record) evaluated all applicable Idaho state legal loads on the existing structure for the first stage of construction via a Load Rating Analysis performed in accordance with the AASHTO Manual for Bridge Evaluation. Construction live loads on the existing bridge were evaluated by the Contractor's Specialty Engineer. The EOR required all construction live loads to be evaluated using the Load Factor Rating method, and all rating factors to be 1.0 or better at an Operating Level analysis.
3	Did the plans contain a suggested staging sequence, and/or did the Contractor develop the staging sequence?	The plans provided a suggested staging sequence.
4	Was lightweight concrete considered to reduce the weight of the deck girders for hauling and erection?	Lightweight concrete was considered at the TS&L (Type, Size & Location) phase of design, but normal weight concrete was selected due to concerns about availability of lightweight aggregate in Idaho.
5	Can you discuss the details of the girder and deck longitudinal connections over the piers?	See Slide 29. #7 reinforcement bars in the top flange of the girders were spliced with a non-contact lap splice in the pier end diaphragms. The reinforcement was designed to control cracking at the service limit state. Additionally, the superstructure is pin connected to the top of the bent with a shear key and #6 vertical bars.
6	How are the piles in the splash zone protected from corrosion?	See Slide 32. The upper portion of the pile above the closure plate was painted with an inorganic zinc paint. Field splices were required to be painted with an organic zinc paint.

7	Can you provide information on the design and construction of the pile bent piers? Were there any considerations for long-term corrosion of the piles?	Regarding pile bent design, see Slides 21, 22, and 30 - 36. Regarding long-term corrosion, see Slide 32. The upper portion of the pile above the closure plate was painted with an inorganic zinc paint. Field splices were required to be painted with an organic zinc paint.
8	Please discuss the choice of steel versus prestressed piles in the bents. Were there any subsurface obstructions that required pre-boring / exploration?	Prestressed piles are not produced by the local prestressed concrete fabricators, and they are not used in Idaho. Therefore, they were not considered. Subsurface obstructions were not encountered in the field explorations or during pile driving. Therefore, pre-boring was not anticipated or required.
	Construction	
9	What type of cement was used on the project, Cement - Type II (MH) or Cement - Type IL (10), and what was the class of concrete used on this bridge?	Prestressed deck bulb tee girders required a compressive strength at release of 7.2 ksi, and 10 ksi at 28 days. All other concrete had a required compressive strength at 28 days of 4 ksi. Portland Cement Type I, II, and III were allowed for use as specified per State of Idaho Transportation Department Standard Specifications for Highway Construction, 2012 Edition.
10	Were there any claims made by the Contractor under ABC construction?	There were no claims under ABC construction that Parametrix is aware of.
	Questions during Webinar	
11	Why were steel piles selected versus prestressed concrete piles for the bents? What pile protection was used against rusting?	Prestressed piles are not produced by the local prestressed concrete fabricators, and they are not used in Idaho. Therefore, they were not considered. Regarding pile protection, the upper portion of the pile above the closure plate was painted with an inorganic zinc paint. Field splices were required to be painted with an organic zinc paint.
12	Did you take any steps to limit differential deflections/vibrations induced by traffic between the two separate structures while the UHPC cured in the closure pour?	See Slide 16. To minimize differential deflections / vibrations induced by traffic for the final UHPC keyway placed during stage 3 of construction, the single lane of traffic was shifted to the right side of the bridge.
13	What bridge design code was used for the project?	AASHTO LRFD Bridge Design Specifications, 7th Edition with 2014 and 2015 Interims were used for the project.

14	How was the overhang designed? Is the barrier wall integrated with the exterior beam for the TL (Test Level) rating?	Overhang design was in accordance with the AASHTO LRFD Bridge Design Specifications, 7th Edition. The bridge rail is a two-tube curb mount rail. The plastic moment capacity of the rail post was used in the design of the overhang. The curb was cast on site after girder erection and placement of UHPC. The bridge rail satisfies TL-4 criteria.
15	Was stainless steel considered for the top steel reinforcement and the steel reinforcement over the piers?	Stainless steel was not considered for the project.
16	How much additional steel reinforcing (in pounds or percent increase) was required for the pile/pile cap connection, if any?	5,552 pounds of reinforcing steel was added per pier cap to make the pile connection. See Slides 34, 35, and 36 for information on reinforcing bars to connect the piles.
17	How did the contractor attach the joint top and bottom forms to the deck (to prevent flow out of the UHPC joint)?	Inserts on the bottom of the girder flange were used to attached plywood forms to the underside of the girder flange. On the top, the plywood forms were secured using buckets with weight placed on top of the forms to hold them in place. See photos on Slide 44.
18	Do you know the price per cubic yard of the UHPC for the project?	The UHPC cost was $6,500 per cubic yard. This includes all costs associated with furnishing and placing the material and grinding the keyways.
19	Is the new rail crash tested?	The new rail met TL-4 criteria per NCHRP 350. This bridge was replaced prior to the new MASH criteria for bridge rails.
20	What was the average depth of the river channel at the bridge?	The average depth of the river channel was approximately 20 feet.
21	Were the stresses calculated for the deflection changes induced by leveling the girders vertically?	No. Past experience of using Deck Bulb Tee girders, and running calculations to verify that the stresses on the girders are in acceptable ranges when leveling the girders, has always indicated the girder stresses are acceptable. The method used by the contractor was considered acceptable without running calculations to verify for this project.
22	Was the prestressing strand epoxy-coated?	The prestressing strand was not epoxy coated.

23	What was the range in lengths for the new in-place pipe piles?	The lengths for the new in-place pipe piles were 82 feet +/-.
24	Is welding a top plate to the top of the 36-inch-diameter piles a detail common to Idaho, the structural engineer, or to the geotechnical engineers?	Yes, Parametrix has used welded plates on top of piles for three different bridge projects in Idaho.
25	Can you please give more explanation about the temporary transverse beam that was used to match the camber of the girders? Is it used only in the middle of each span or in other locations?	Steel beams placed above and below the girders with wood blocking between the beams and girders were used in conjunction with threaded rods. The rods were tensioned equally until the girders aligned. The steel beams were used at midspan for this project.
26	Have you evaluated the residual stress caused by the camber correction?	No. Equalization of cambers for Deck Bulb Tee girders is standard practice in the State of Idaho. Parametrix is not aware of any deck bulb tee girder bridges in the State of Idaho that have shown signs of cracking or distress from this procedure.
27	What design case controlled the bent cap design?	Strength 1 controlled bent cap design for vertical loads, and the Engineer of Record directive to design the cap beam for the full plastic moment of the piles controlled bent cap design for lateral loads.
28	What were the traffic delays during construction? Were there any issues with wrong-way traffic? How were oversized / wide loads addressed? Were night / weekend / extended closures allowed during construction, with a reasonable detour route provided?	Intermittent traffic delays occurred throughout construction to allow for delivery of materials. For example, the traffic was stopped for girders. Flaggers were deployed by the contractor at moments like this during construction. Parametrix is unaware of any wrong-way traffic issues or any extended closures during construction.
29	Was there any longitudinal rebar in the closure pours between the beams? Did you determine these were not needed considering temperature, shrinkage, and negative moment over the piers?	No longitudinal bars are placed in the UHPC keyways between the beams. Longitudinal bars as required were provided in the top flanges of the girders.
30	Can you show the girder prestressing strand diagram? What diameter strand was used, and how many strands were put in each girder?	The girders each have a total of (44) 0.6-inch-diameter 270 ksi low-relaxation strands. In the bottom bulb of the girder there are 24 straight strands, and in the web there are a total of 20 harped strands.

31	How were the utilities attached to the bridge? Were cast-in-place or precast anchorages used for the utilities? Were expansion anchors used for the utilities?	Inserts on the bottom side of the girder top flange were installed to receive threaded rods connected to a transverse steel angle suspended under the bridge deck at 20 ft on center to support utility conduits. Post-installed expansion anchors were not used.
32	What is the design life of the new bridge? Is it 100 years?	A 100-year design life was the goal.
33	What type of waterproof membrane was used before placing the asphalt overlay?	A spray-applied waterproofing membrane was used that met the ASTM C 836-00 Crack Bridging Test as applied.
34	If post-installed anchorages were used for the utilities, how did they clear the rebar and the prestressing strand in the beams?	All anchorages to support utilities were made with inserts cast into the underside of the precast girder top flanges. No post-installed anchorages were used.
35	Was there any concern on the stability of the existing piers while driving new piles adjacent to the existing foundations?	In conversation with the geotechnical engineer during the design, there were no concerns about the stability of the existing piers when driving new piles adjacent to the existing foundations.
36	Were the deck bulb tees an Idaho standard, an AASHTO standard, or were the details borrowed from another DOT?	The deck bulb tee girders used on this project are an Idaho standard.
37	How long are the piles at the bents and the abutments?	At piers, piles were 82 feet long. At abutments, piles were 70 feet long.
38	What was the design scour depth for the new bridge?	The design scour depth at the 100-year event was 7.8 ft. At the 500-year event, it was 8.2 ft.
39	What corrosion protection was used for the prestressing strands?	No special corrosion protection requirements for the prestressing strand were incorporated into this project.
40	What depth to fixity was used in the pile design?	The pile design used a depth of fixity of 20 feet below the design scour depth based on an L-Pile analysis.