

**August 2017 ABC-UTC Webinar Featured Presentation: 87-Hour Bridge Construction in Arizona –
ABC and ARC at the Speed of Commerce**

Q&A Session: Questions	Responses
Planning	
<p>Why speedy delivery in remote area? Was it for demonstration and less public inconvenience? Real life has limited work area.</p>	<p>There are many reasons ABC makes sense for remote area locations. From the Contractor's perspective, there is a need to find skilled labor and windshield time. For the Owner, similar holds true for materials and construction inspection related services in addition to the need to maintain essential services such as fire, ambulance, school bus routes, mail delivery, garbage pick up. This site had a limited work area. In planning the Owner decided to forgo the time and resources that would be needed to secure the environmental permits for additional temporary right of way. By doing so, the project was able to be advertised earlier and the costs and resources saved justify any cost increases that occur from accelerated construction.</p>
<p>Contract procurement method, local or national general contractors, and maintenance plan for this bridge/length of service life.</p>	<p>The contract procurement method was Design-Bid-Build. The contractor is a national contractor that does a significant volume of work for ADOT and had local staff working on the project. The County will maintain the bridge.</p>
<p>Could you please compare the time it needs for an ABC project in design phase vs traditional ones? (In rough percentage)?</p>	<p>This depends on the complexity of the project. On this project the design was completed on an expedited schedule and therefore the time for traditional and ABC design were very similar. The one aspect of design with ABC that more time is spent on is the constructability of the project and thinking through the logistics of how a contractor can get the work accomplished in a tight schedule window and often with a tight workspace.</p>
<p>Would the DOT consider this technique without grant award in the future? What is the cost increase using this technique?</p>	<p>ADOT is actively looking for options of utilizing ABC and PBE in the future where it makes sense on a project. Rural routes can benefit from this expedited construction when detours can get lengthy. The cost increase on this project was minimal, but that will be project specific depending on complexity. The real savings with ABC comes from the user cost savings during construction.</p>
<p>What is the ADT on this route?</p>	<p>2000</p>

<p>Is ADOT using approach slabs that are integral with abutments/caps eliminating the need for expansion joints/dams at the bridge and if so why wasn't it used on this project?</p>	<p>ADOT use of integral approach slabs is based on project requirements. This project had the approach slab pinned to the abutment diaphragm and therefore expansion joints were not required.</p>
<p>Other than safety to workers and motorists, why was it decided to use ABC as opposed to conventional?</p>	<p>The main purpose for the use of ABC was to minimize the roadway closure time. With a narrow two lane road phased construction was not practical and the detour was 24 miles. So to minimize impacts to the traveling public ABC was used to limit the road closure to 4 days instead of 11 weeks.</p>
<p>Design</p>	
<p>Would aluminum pedestrian railings be an advantageous component for the pre-fabricated bridges?</p>	<p>Each project should evaluate the type of barrier to be used. On this project a traditional concrete barrier was chosen based on cost and to minimize future maintenance requirements for the County. In addition, there was room for the contractor to place the barrier after the roadway was re-opened.</p>
<p>Describe the connections and clear cover requirements at the precast member joints.</p>	<p>The joints were typically doweled joints with sleeves in on member and dowels extending from the other. The sleeves were then grouted with high strength grout. Consideration to reinforcement placement was required to provide clear cover around the sleeves. The only location where additional clear cover was required was the top of the bridge deck to allow for grinding if necessary to get the bridge profile correct, but this was not required.</p>
<p>What was the spacing between girders?</p>	<p>5'-2"</p>
<p>Two Part question: 1. How long ago was the bridge finished? 2. Have inspectors discovered any cracks in the deck, specifically in locations where the closure mix was poured?</p>	<p>Bridge construction was completed on March 16, 2017. The County has been out to the bridge multiple times since the completion of construction and cracking has not been an issue.</p>
<p>Two part question: 1. What did you use to form the void in the abut caps? 2. If it is a biodegradable material, did you also provide vent holes in the caps to allow gasses to escape as the material decomposed?</p>	<p>Polystyrene was used for form the void in the abutment caps. Vent holes were not provided.</p>
<p>What was the expected settlement of embankment?</p>	<p>The roadway embankment was placed in accordance with traditional requirements for roadway construction and compaction was tested at normal rates. Therefore embankment settlement is anticipated to be minimal and certainly no more than had the project utilized standard construction methods.</p>

Construction	
What formwork/systems were used?	Traditional wood forms were used to form the deck. Stay-in-place formwork was not used on this project.
Who was the steel fabricator on the project?	Schuff Steel - a local steel fabricator.
With the bridge being mostly prefabricated, did you run into any field conditions that created some difficulties?	After all the PBEs were constructed the bridge was assembled in the Phoenix construction yard where the individual pieces were cast. This allowed us to make sure everything fit up prior to assembly in the field. Overall, there were not significant fit up issues in the field.
Does the reported cost include roadway, mobilization, and bridge, or is it for the bridge only. If the former, how long was the roadway does this include?	The cost was for the total project construction. The length of roadway work was approximately 1500-ft and included placement of 8700 CY of embankment and 1000 Tons of Asphalt Pavement.
Closeout	
Please make sure to include "lessons learned".	Lessons learned were included in the presentation. There is also a link to a Lessons Learned document that was prepared after project completion on the website.
General	
What percentage of bridge construction uses the ABC method?	Approx 80% per time and cost
What types of composite materials were used and volumes for the various applications? Carbon Fiber, Aramid, Glass...	Traditional construction materials were used.