



EXTERNAL MEMORANDUM

Lessons Learned Meeting Notes

Distribution Date: April 24, 2017

Date of Meeting: April 19, 2017

Project: **Sacramento Wash Crossing at Oatman Highway**
TRACS No. T0021 01D
Federal Project No.: MMO-0(216)T
CONSTRUCT NEW BRIDGE CROSSING

Date and Time: Wednesday April 19, 2017, 8:00 am

Place: ADOT – Green Room
206 South 17th Avenue
Phoenix, AZ 85007

Attendees: Benjamin Beerman, FHWA
Kimberly Utley, FHWA
Rashidul Haque, ADOT
Steven P. Latoski, Mohave County
Tim Walsh, Mohave County
Josh Wentzlof, ADOT
Lee Smith, ADOT
Reece Green, Pulice
Kevin Kimm, Kimley-Horn
Raj Christian, Kimley-Horn

From: Raj Christian, Kimley-Horn

The meeting notes for the aforementioned project are attached for your information and use. If the notes do not reflect your understanding of the meeting discussions or if you have any comments, please respond within five working days.

Thank you to all who participated.

April 19, 2017

**SACRAMENTO WASH CROSSING
OATMAN HIGHWAY, MOHAVE COUNTY
TRACS No. T0021 01C
Federal Project No.: MMO-0(216)T**

LESSONS LEARNED MEETING

A meeting/conference call was held to discuss lessons learned during the construction of this new bridge project. In coordination with the Federal Highway Administration (FHWA) and Arizona Department of Transportation (ADOT), and utilizing an FHWA-approved Accelerated Innovative Deployment (AID) Demonstration Grant, Mohave County constructed a new bridge across Sacramento Wash on Oatman Highway (Historic Route 66) located one mile north of I-40, in Topock, Mohave County, Arizona. The bridge was constructed utilizing the FHWA's Accelerated Bridge Construction (ABC) technology using Prefabricated Bridge Elements (PBE). The bridge and roadway were constructed in less than 96 hours, minimizing roadway closures and a lengthy 24-mile detour.

ADOT Communications has prepared a YouTube time lapse video of the 96-hour ABC construction period. Clips with notations from the video were reviewed for content.

- How the project cost was presented was discussed. It was decided that the total construction cost would include the Construction Administration (CA) and/or Construction Engineering and Inspection (CE&I). The cost would be shown as \$2.4 M including roadway, bridge, and CE&I.
- Ben noted that the cost of the bridge was low compared to other similar projects located back east.
- The notation implying the bridge prevents flooding was agreed to be revised to say that 'Crews moved 8,700 cubic yards of roadway and paved 1,500 feet of asphalt.'
- Ben suggested to add the following notation at the end of the video:

ABC results in reduced onsite impacts:

- Minimized traffic impacts
- Improved safety, quality, and agency resources
- Improved customer satisfaction; ADOT is here to serve the public

The following summarizes the Lessons Learned discussions:

Reece Green (Pulice) –

- Overall a very successful project with great coordination between all parties and very limited issues.
- Approach slab – consider using a cast-in-place (CIP) approach slab. No significant time would be added to this project since already setting up forms and having to place closure pours. CIP would have saved cost, and improved rideability and ease of construction. The precast slab was effective, but some concrete grinding was required on one panel.
- Select fill for retaining walls – good idea (innovative); However, Aggregate Base (AB) also has advantages and is cheaper.
 - Select fill takes longer to source material and requires more hand work versus equipment to place.
 - AB can be worked with equipment instead of hand working, freeing up crew and saving time.
 - Not a huge advantage but taking into consideration the conditions can make it a better option on some projects.
 - From the design side, the select fill with geotextile was used to reduce lateral loads on the retaining walls and allow them to be designed with limited heel length, thus allowing construction of the walls without impacting traffic. Where this is not required, the advantages of AB should be considered.
- The suitability of onsite materials for embankment was a positive and helped the project success. With the limited right-of-way there was not enough room to store material and construct. Time and congestion of people to haul materials in from another location and to excavate and remove local materials would have delayed the project.
- The project schedule was controlled by the roadway construction (80 hrs). Total bridge construction time was approximately 30 hrs.
- Collaboration with local staff to obtain staging space at Topock Port of Entry (I-40 WB) was a big help. ADOT was a great partner. Precast Bridge Elements (PBEs) were delivered and stored near the project site a week ahead of the ABC period to ensure all materials would be available when needed during the closure.
- Seeding timing was the biggest issue.
 - Bonded fiber seeding could have been used to meet the schedule, but after several conversations, the Arizona Department of Environmental Quality (ADEQ) said they could not consider it established in the time required.
 - Seeding went into escalation. Ultimately, rocks were used on the slopes in lieu of seeding to meet contract time requirements.
- Consider if there is a way to better vet the steel source. At the time of bid, steel suppliers were on board with the schedule, but when it came time to execute contracts with them they noted that more time was going to be required. The issue

- was compounded by the time required to get Pulice's contract executed with ADOT.
- Steel took 9-10 weeks to travel from Indiana due to unforeseen supply issue with the mill line.
 - Ideal schedule allowance for structural steel would include 10-12 weeks for procurement of the steel (two weeks at the beginning of the process to finalize the contracts and then a normal 9-10 weeks for production and shipment.)
 - Pulice took a risk by procuring steel prior to having a contract to avoid a delay.
 - Case Foundation tagged the overhead power line while moving the drill rig during drilled shaft installation.
 - County was called and within 15 minutes crews were onsite to repair the line. Power was restored in 30 minutes. County crews were very responsive and the project schedule was not delayed.
 - Pulice utilized their I-10/SR 303L construction yard for casting the PBE elements. If they did not have this project site, they would have still done PBE work in Phoenix.
 - Better material and fast suppliers in Phoenix. Hard to get quality material near the project site and still would have to haul material from suppliers some distance away.
 - Collaboration between Districts allowed for inspections to be completed in Phoenix by local staff instead of dispatching staff to the yard from Kingman.
 - Concrete, structural grout did not achieve strength as quickly as they thought it would.
 - Hoping for 4-6 hours; ended up taking 10 hours to get to 1000 pounds per square inch (psi)
 - Need more specials on these grouts and strengths that are needed at specific times.
 - Pulice did a dry run ahead of construction with points of contact and inspectors to relay schedule.
 - Everyone was fully aware of the schedule and knew where to be and when to be there.
 - Fortunate that there were no rain events.
 - Protection in place up the road and a pumping remediation plan for roadway subgrade was created.
 - ABC was stockpiled on both sides to circumvent a pumping delay in case of a rain event.
 - Regarding the bridge construction, the one issue was related to getting one of the backwall panels to line up with both the reinforcement and bolting to the ends of the girders. Consider alternative details that would provide more flexibility in the connection. Consider having a provision on the plans noting a minimum number of bolts/connections that are required, if not all, in case there are some alignment issues.

- Profit margin compared to conventional projects.
 - Did not lose money.
 - Real motivation behind chasing the project was the desire to perform new and different types of construction projects.
 - Successful completion of the project was critical to Pulice. They take pride in doing good work and everyone was invested in making the project a success. There were a number of great relationships developed through the process and turned into a successful project to help build everyone's resume.

Josh Wentzlof, ADOT

- The “Alternative Site Casting” allowed for Pulice to build bridge elements in Phoenix. ADOT Structures in Phoenix provided the inspection and testing of this work, which was a huge help to the District staff. If District staff would have been required to send a full-time inspector to inspect bridge elements in Phoenix, the CE&I costs would have been higher. It was noted that if the contractor would have cast the elements on site, the District would have been able to inspect the bridge with a full-time inspector.
- One issue encountered during the construction process was that the bridge element items were created in the contract as “Each” instead of “Lump Sum” items. This caused an issue when the pre-cast structure elements were complete in Phoenix and the contractor was requesting partial payment for work completed. “Each” items are to be paid in full at time of full completion of work, which in this case was not reasonable to expect the contractor to absorb those costs for months until the bridge is complete. “Lump sum” items allow for partial payments based on the percentage of work complete. For this project, there was collaboration and partial payments on bridge elements were made, but the items were not set up to do so.
- It takes significant lead time to procure third-party inspection for structural steel inspections. Typically, it takes about three months to negotiate and procure the contract. This process was expedited to not cause delays for this project, but if this could be accounted for prior to bidding and awarding the contract the need to expedite could have been avoided. It would be good to start this process early, especially if the schedule is tight, perhaps working with the Bridge Group to try to procure this contract prior to contract bidding and award.
- One note that was made by the construction field staff is to consider having pre-qualifications for contractors to bid on projects like this. This project was fortunate to have been awarded to a contractor like Pulice. If a less experienced contractor would have performed the work, there may have been more issues than were encountered on this project. This may need to be considered during the bidding process to ensure that a qualified contractor is awarded the project.

- The biggest lesson learned is that when there is full cooperation from all parties involved and everyone is on the same page of building a successful project, the results will turn out successful.

Level of public outreach

An eight-question postcard will be sent out to 1,760 local property owners in and around the project area. The questionnaire was targeted to get information on the following:

- Awareness of project
- Overall satisfaction
- If they would support more accelerated construction projects