

**ABC-UTC September 2022 Monthly Webinar:
Caltrans' 21st Avenue Bridge: Identify & Implement**

#	Questions	Responses
	Design	
1	How was the public engaged to notify them of this work and its benefits to the adjacent community? How are these lessons learned shared within Caltrans?	Caltrans' public information office implemented a multi-faceted public outreach campaign. Key strategies for this particular project were "open-house" meetings conducted near the site, geo-fenced streaming service messaging, as well as multi-lingual TV and radio spots. The "lessons learned" with regard to outreach and community engagement are summarized and available as a reference to our ABC Specialist team for use in developing future outreach campaigns.
2	Was there any consideration of repair instead of replacement of this bridge?	The initial design concept consisted of superstructure repair/supplement utilizing a reinforced cast-in-place deck on deck approach. This was ruled out due to the degree of deterioration of the existing voided-slab superstructure, the added dead load it would impart, as well as the required multi-stage construction process.
	Construction	
3	Can you discuss the primary lessons learned on this project, that would have made significant differences, if known?	From a Design standpoint, further refinement of the UHPC joint sealing mechanism would greatly benefit future operations in the field. (Achieving watertightness is critical and consistently problematic in the field.) From the Construction Management perspective, further refinement of Contract requirements for verifying existing structure dimensions and calculation of UHPC order quantities would address challenges we faced.
4	What were the safety considerations for such high ADT (average daily traffic)?	ADT was the driving force behind nearly all type-selection and contract development processes. Ultimately, it was determined that the performance of work adjacent to live traffic lanes represented too great of a risk and a full closure was selected as the means of mitigation. Preparatory and closeout scope that was conducted under lane closure was, whenever possible, performed behind a positive barrier with significant traffic signage packages in place.

5	Do you think there should be some changes in contract structure and the pre-construction approach after completing this project?	This contract benefited greatly from the Department's recent experience on the Echo Summit Sidehill Viaduct Replacement project. That being said, continued refinement of preconstruction submittal requirements is something our ABC team will be focusing on, as well as a likely increase in construction-phase investigative efforts to verify controlling dimensions, conditions, and materials in the field ahead of closure.
6	Regarding more design examples, do you have any more similar projects scheduled or underway at this time?	Caltrans recently completed the Champlin Slough bridge replacement on SR-99 near the City of Red Bluff, approximately two hours north of the 21st Avenue site, using very similar design details. The Jacoby Creek Bridge Replacement was also recently completed, utilizing a lateral slide process. The Department's ABC Specialists work in tandem with the various District Design groups to identify suitable candidates for ABC implementation.
Cost		
7	Can you address cost of ABC versus conventional design-bid-build construction?	Because the Project Development Team almost immediately determined that traditional construction methods were not applicable, a full project estimate was not developed under that pretense. From a support perspective, the Department's Estimation Division compared projected costs for a 3-stage traditional project to the proposed single-closure and determined there was a net savings associated with the proposed ABC approach.
Questions during Webinar		
8	How did you manage traffic control during the bridge construction?	The Contract Documents included pre-designed traffic and pedestrian detour routes along with the signage necessary to implement them. These routes were in turn advertised to the public and the project stakeholders, including the California Highway Patrol (CHP). During their use, multiple crews were assigned to the inspection and maintenance of the sign packages and the CHP provided round-the-clock supervision and enforcement. Caltrans also utilized the existing highway information system to broadcast information specific to the closures throughout the four adjacent counties to keep the travelling public informed.

9	What does PDT stand for?	PDT stands for Project Development Team.
10	What does SM&I stand for?	SM&I stands for Structure Maintenance & Investigations.
11	How would the variable camber from girder to girder be handled?	Differential camber inherent to the installation of precast girders was mitigated through both the required grinding (to flush) of the UHPC joints which reduced the in-place height differences between adjacent girders and the per-plan polyester overlay which addressed any remaining surface irregularities as well as providing a sacrificial wear surface.
12	Can you expand on the SmartRock monitoring system used for the UHPC joint?	GIATEC's Smart Rock monitoring system utilizes wireless sensor modules which are embedded in the concrete member. These can be assigned unique IDs and then tracked in real-time through their proprietary App. The App can be preloaded with the relevant strength development data and thus provide real-time maturity data based directly upon the prequalification data compiled during the preconstruction phase.
13	How much schedule detail of the activities was required in advance of the shutdown?	The Contract required submittal and authorization of operation-specific work plans (i.e., UHPC Prequalification, UHPC Mock-Up, UHPC Placement) that were required to be of sufficient detail to clearly describe the work, subject to review and determination of adequacy by the Engineer. In this case, the Contractor developed and submitted a closure plan that detailed activities at 15-minute increments for the entire 100-hour closure duration.
14	Did you consider using an alternative that had fewer longitudinal closure joints?	Wider deck "panels" were indeed considered; however, they presented two issues that ultimately led to selection of the narrower box girders. For one, the use of precast voided panels would have reduced the number of local vendors capable of supplying the project, which was a concern even ahead of the logistical complications brought on by the COVID-19 pandemic. Secondly, wider panels would have made it more difficult to match the existing roadway section and potentially would have required substantially longer paving conforms in order to contour into the existing mainline profile.

15	There is not a concrete deck slab over the box beam. Is the box beam top flange sufficient to serve as the deck riding surface?	Yes, the selected beam design is capable of supporting all anticipated loading. In this case, the top "flange" of the box girders ends up continuously supported by the UHPC joint itself. The polyester overlay is not a structurally significant member and serves only as a wearing course.
16	Was there any clear explanation for the shortage of UHPC in the longitudinal deck closure pours?	The final determination was that a number of contributing factors resulted in the under-run. These included waste at time of initial production batching, spillage, irregularity in the joint dimensions, girder fit-up tolerances, differential camber between adjacent girders, and potential miscalculation of the volumes used during the mock-up and prequalification processes.
17	Are you worried about surface cracking over the joints along the length of the beams?	No, selection of the UHPC joint mechanism was data driven and based upon observed performance of similar joints. UHPC joints and the per-plan dowel details are more than adequate to eliminate the potential for differential displacement of adjacent girders if correctly installed.
18	Thanks, David and the team, very interesting presentation & Q&A session.	We appreciate the opportunity to share our project and hopefully contribute to your own designs and implementation of ABC strategies and technology.