

April 2016 ABC-UTC Graduate Student Seminar: ABC Solutions

Q&A Session

Featured Presentation #1 by Jawad Gull, Ph.D.: ABC Project Database	
Why does a project need owner pre-approval and final approval? Or what does the owner check in a submitted project summary and complete submission?	Only completed ABC projects approved by the owners are eligible for the database. Some bridges are considered “critical” infrastructure, and the various states also have different legislation and internal requirements about what can be disclosed about their bridges. The owner pre-approval says that the owner is OK with that particular bridge being on the open web, and the final approval says that the owner is OK with those particular details on that particular bridge being on the open web. The pre-approval also protects the submitter from doing a lot of input if the owner can’t approve the bridge being on the open web due to the constraints under which the owner is operating.
What is the role of the ABC Steering Committee? What does it check in project summary and complete summary?	The ABC Database Steering Committee works with the submitter and the owner to ensure the details in the database are correct, correctly input, and consistent with the bridge owner’s approval. The pre-approval of the Steering Committee, prior to its requesting owner approval, also ensures that the bridge does, in fact, have ABC aspects. This is needed because anyone can submit a bridge, and the submitter may not understand what ABC is. For example, some still think use of a precast pretensioned I-shaped girder is ABC; however, those girders have been used for over half a century. If those girders are pre-topped with a deck, for example, they then become ABC because a construction step has been eliminated with the deck being cast offsite.
Will the ABC database be available for private companies (consultants & contractors) to use? Is the database available for public consumption / review?	Yes, the ABC Project Database is open to all. You can access it from the ABC-UTC website (http://www.abc-utc.fiu.edu/).

<p>Are there cases where ABC really isn't a good solution? Is it always just a trade-off for cost?</p>	<p>Our opinion is that ABC should be considered as the first choice at the planning stage, and only not used if it's determined that it doesn't provide benefit. New alignment construction with no need for speed might be one reason to not use ABC. The ABC initiative began because of a need to reduce traffic disruption as our aging bridges are being replaced. Other benefits in addition to reduced traffic impacts are reduced onsite construction time, improved work-zone safety, improved site constructability, improved material quality and product durability, minimized environmental impacts, and reduced life-cycle cost. All these benefits have been reasons for the use of ABC in projects. While most ABC projects have an incremental increase in cost for the speed of construction, ABC can cost less than conventional construction depending on the project.</p>
<p>How is the ABC Project Database kept current? Are there dedicated funds to sustain it?</p>	<p>The ABC Project Database is kept on a secure server that is hosted at FIU and backed up daily. The ABC Steering Committee makes updates to projects in the database as bridge owners and submitters let us know the specific updates that are needed. The Steering Committee gets approval from the bridge owners before the changes go live. Regarding the question on funding, the database is in the ABC-UTC program of work.</p>
<p>What is the approx. length of time to demolish a superstructure (concrete) of an overpass for an ABC project?</p>	<p>The time required to demolish an existing bridge superstructure depends on the method of demolition used, and the method of demolition used depends on the constraints of the project. Conventional demolition can be completed in days. Using SPMTs to roll the existing span out can be done in minutes.</p>
<p>Based on the pilot projects to date, what is the average user cost savings needed to offset the typical cost of the accelerated construction? What ADT's are required before we will see ABC being widely used for DOT bridge replacements?</p>	<p>I don't have an average user cost savings that would be needed to offset the typical cost of ABC. However, user cost savings are typically orders of magnitude greater than the incremental increase in construction costs due to the ABC aspects of the project. Concerning the question about what Average Daily Traffic would be required before we see wide use of ABC for state DOT bridge replacements, we've seen DOTs use ABC for ADTs as low as a few thousand, to over a hundred thousand vehicles per day. But ADT is not always the reason for use of ABC. Vermont, for instance, is using ABC for many of its bridges because of its otherwise long detour lengths and because ABC is the most cost-effective solution when temporary bridges are avoided due to the short closure times possible with ABC. Again, the use of ABC depends on the constraints of the project. In addition to reduced traffic impacts, other reasons for ABC include reduced onsite construction time (for example, if it's on an emergency evacuation route), improved work-zone safety, improved site constructability (contractors have field changed ABC into projects for improved safety and constructability), improved material quality and product durability (improved because of the controlled fabrication conditions), minimized environmental impacts, and reduced life-cycle cost.</p>

Is there a database of current or future ABC projects?	We are encouraging submissions of newly completed ABC projects into the ABC Project Database. The database only houses completed projects. We do not have a database of future ABC projects.
Featured Presentation #2 by Ramin Taghinezhad: Extending Application of SDCL Steel Bridge System to ABC Applications in Seismic Regions	
Costs associated with SDCL in seismic areas?	Up to now, several bridges constructed in the non-seismic regions and according to our investigation the SDCL construction method was roughly 10% more economical than conventional construction method. For the seismic region, we do not have a precise estimation.
Why in the finite element model you applied the concentrated load at 0.2 length of girder?	0.2 length of girder is the inflection point under gravity loads.
When do you think we can use the detail in seismic area?	After completion of all three phases, the SDCL detail can be used in seismic areas. In Phase I the load resistance mechanism was identified and the seismic behavior of the SDCL detail evaluated. In Phase II a cyclic loading will be applied to the component specimen to investigate the possible damages and load resistance mechanism. In Phase III, a complete bridge with all the components will be constructed in the structure lab. The connection between steel girders will be an SDCL connection and the bridge will be subjected to a shake table test to study the real performance of the connection due to earthquake excitation.
Why did you apply push up force?	Push up forces applied to the system to simulate vertical component of earthquake loads.