

ABC-UTC November 2022 Monthly Webinar: East 138th Street Bridge Replacement Project: A Marriage of ABC and Digital Delivery at NYSDOT

#	Questions	Responses
	Design / Preconstruction	
1	Does NYSDOT have either an ABC checklist or a manual to determine projects for ABC techniques?	Section 3.2.7.3 of the NYSDOT Bridge Manual discusses three levels of ABC: reduced on-site construction, compressed on-site construction, and accelerated on-site construction. The use of ABC is included in the scoping of all our bridge projects to determine if ABC is needed.
2	What methods of ABC would also be applicable regarding this technology?	ABC is site specific, and any type of ABC can be used with digital delivery and model based contracting.
3	Has this technology been used over waterways?	Digital delivery and model based contracting can be used for any type of bridge crossing. ABC technology also lends itself to use for bridges crossing waterways. In New York State, we have a multitude of structures crossing smaller waterways that utilize precast bridge elements, such as boxes, frames, and arches. This presentation covers some examples in the first segment, including larger scale applications such as floating a prefabricated bridge into place.
4	What software platform was used, and is this going to become a standard with most CAD platforms moving in this direction?	NYSDOT utilizes the Bentley software platform for all of our transportation projects. We are very excited for all software to implement BIM (Building Information Modelling) and IFC (International Foundation Class) so that the type of software chosen doesn't affect the transfer of digital data.
5	What, if any, were the supply chain problems regarding this technology?	There were no supply chain problems on Pilot Project #1. There were no supply chain problems that we are aware of on Pilot Project #2.
6	What other solutions for applying "zero load" to the utilities were considered?	Other solutions include the following: heavily reinforced abutment, prestressed beam buried in the abutment, post tensioning was investigated, and steel carry beam system embedded into abutment. The excavation support system was challenging to design as well; designers had to make sure that the existing sewer was not loaded during construction activities also.

	Construction	
7	How do the field construction offices receive the digital plans? Which viewing technology/devices do they use? What training is provided for the field offices regarding this technology?	The field office receives the same digital files that the contractor does. They use tablets in the field with CADD viewing software.
8	How were the design models utilized by the contractor during construction?	For the first pilot project, the contractor extracted relevant information from the models and loaded it into their survey software for use in the field.
	Questions during Webinar	
9	For a precast deck on steel beams, where the section is inverted for casting, how is camber handled on those units?	The contract documents provided a camber table for each prefabricated unit, and the following note: THE CONCRETE DECK SHALL BE POURED IN THE SHORED CONDITION ACCOUNTING FOR THE CAMBERS PROVIDED. THE SHORED CONDITION REQUIRES THAT THE STEEL DOES NOT DEFLECT UNTIL AFTER THE CONCRETE DECK REACHES A STRENGTH OF 3000 PSI.
10	Can you describe the reception of digital plans from the construction industry?	Extensive outreach to the contracting community was done during both pilot projects. Lessons learned were incorporated into the second pilot project, based on feedback from fabricators and the contractor for the first pilot project.
11	With plans being digital, what do you do for as-built plans?	The as-builts for the project are in the same format as the original contract documents. Some of the record plans will be in PDF form, some in Excel, some in CADD, etc.
12	Can you describe specifications provided as part of the electronic plans?	NYSDOT specifications were referenced in the 3D models using the Bentley tool called Item Types. The specification number, notes to contractor, etc., were given in the Item Type for each portion of the 3D model, similar to how a specification would be referenced on a conventional plan sheet.
13	How are steel girder camber diagrams handled in 3D projects?	The contract documents provided a camber table in Excel spreadsheet format for both projects.

14	Can you describe how construction personnel handled the electronic plans?	Construction staff used tablets in the field with CADD viewing software to use the electronic plans. For the first pilot project, the contractor extracted relevant information from the models and loaded it into their survey software for use in the field.
15	Slide 35: Do you know if the contractor utilized the 3D model to design the temporary falsework bent for pilot project #1?	The contractor was given the option to provide model based submittals for approval, but for both projects, the contractor chose to use conventional 2D submittals.
16	With regard to choosing the delivery method that maximizes return on investment, if fabricators expressed concern with receiving the steel design through a full 3D model, is dumping it down to electronic spreadsheets (pilot project #2) really preferable to dumping it all the way down to a traditional framing plan and girder elevation plan sheet? Is there something that makes the spreadsheet preferable to a plan sheet, when the contractor or fabricator does not prefer a 3D model?	Ideally, the designer would submit structural steel information in a format that can be immediately used by the fabricator in their software platform. But right now, the software interoperability is not there yet. Using spreadsheets reduces the manual keying in of data for the structural steel and is one step in the right direction, until software interoperability has expanded.
17	Is there a way to convey the accuracy of underground utility locations? (Some utilities may be precisely located prior to construction, while others might be just estimated locations.)	One challenge with a 3D model deliverable is the inherent precision of the object that is modeled. In conventional 2D plans, an object can be drawn not to scale and labelled as such. But once a 3D model is created, it can be measured and is assumed to have precision based on those measurements. Item Types can be used to add notes to the contractor for approximate locations, but it would not be recommended to model a feature if its location is unknown or approximate. For the second pilot project, all utilities were surveyed during design, including extensive field reconnaissance to verify their locations and depict them as such in the model.
18	Are the construction documents for the 138th Street project available to the industry through the NYSDOT website?	Yes, google the contract number, D264507, and you will find the contract documents on the NYSDOT website. (The direct link is also available in the November 2022 Monthly Webinar Archives.)

19	What software was used by field staff / contractors for visualizing the model?	The field office receives the same digital files that the contractor does. They use tablets in the field with CADD viewing software, specifically Bentley View.
20	Slide 62: What grade of steel is specified for the carry beam, and is there any type of corrosion protection other than the concrete encasement?	The carry beams are 50 ksi steel and are metalized for protection. The contractor was given the option to galvanize, but elected to metalize the beams.
21	Where are the record copies of the 3D files stored? If there is a revision to a 3D model post-advertisement, how are the changes indicated?	Record plans for these pilot projects are stored electronically, just like any other NYSDOT project. Revisions to the 3D models were incorporated into the record plan model by the designers.
22	What is the size of the carry beam for the 138th Street project?	The carry beams are fabricated steel plate girders, with 2.5-inch x 24-inch flanges and a 1.25-inch x 31-inch web.
23	You mentioned that the carry beam system supports the gravity load and earth pressure. Are seismic loads also included in the carry beam system?	The carry beam system was designed per the NYSDOT LRFD Bridge Design Specifications.
24	Can you explain how you obtained accurate information for the existing utility locations? The clash detection assumes the utilities are in the right location. Was a Subsurface Utility Exploration performed to confirm the locations?	Yes, all utilities were surveyed during design, including extensive field reconnaissance to verify their locations and depict them as such in the model.
25	What is the protection system to protect the carry beam since it is located underneath the ground?	The carry beams are metalized for protection.
26	Were there any changes that were made during construction based on the contractor's means and methods? Do the models need to be updated and re-issued? If so, is it a significant effort to update the models?	The second pilot project has incorporated changes based on the contractor's means and methods. Revisions are made to the models, similar to the conventional Field Change process.

27	How do you ensure that digital files can be accessed in 20 years as data storage models change?	The same way that we have confidence in our current record documentation using .doc, .pdf, .tif, etc.
28	How do you deal with revisions made to the plans, and how do you make sure that every person who needs the plans is provided with the latest revision?	Revisions to the 3D models are incorporated into the record plan model by the designer. A time stamp, as well as a change to the file name, designates the change to the model.