February 2018 ABC-UTC Webinar Featured Presentation: Northeast Extreme Tee (NEXT) Beam with Rochester VT Case Study		
Q&A Session: Questions		**Responses**
#	**Job Specific - General**	
1	Who did the Design? In-house by VTrans or a consultant? Was the project funded by FHWA? Did you need sole source specs?	Vanasse Hangen Brustlin, Inc. (VHB); FHWA 80% Federal, 20% State; No
	Job Specific - Design	
2	Address durability, type concrete, type of reinforcement, etc.	Z-bar reinforcement was used on Rochester but is no longer available. Epoxy and stainless steel rebar are generaly specifed currently. Low permibilty concete mixes with compressive strengths ranging from 6,500 to 10,000 psi are used.
3	HPC utilized in the precast? Nominal design life of the completed bridge?	75-year design life
4	How did the actual cambers match the predicted cambers? Was the modulus of elasticity determined by test or by formula?	Rochester did not have a camber control program requirement. However, the beams did align very well. Refer to PowerPoint presentation for more detail regarding modulus of elasticity.
5	Could you discuss some unexpected results, both good, and bad, the solutions, and recommendations?	Longitudinal cracks at acute interior corner of the NEXT Beam. Details have been modified to include crack control rebar. We learned that a larger grout port was required at the pile sleeve locations to quickly discharge and fill the sleeves. It's best to fully extend the sleeves through to the top of the abutments if possible.
	Job Specific - Construction	
6	Cracking prevention during shipping and lifting of these units?	PCINE details have evolved to incorporate crack control reinforcement in the end zone of the beams. At this point in time there are no procedures to prevent additional cracking in the NEXT beams during handling, shipping, and erection. Note that the majority of the end cracks are encased in the diaphragm/curtain wall pour and the remaining exposed cracks can be sealed to ensure long-term durability.
7	Are there any signs of longitudinal cracking in the joints?	No, we are not aware of longitudinal cracks in the joints of NEXT beam projects.
8	Product Delivery--What type trailer is being used to deliver the NEXT beams to the job site?	Refer to PowerPoint presentation.
9	What was the final strength of the concrete closure pour? What was the strength when you opened the bridge to traffic?	7000 psi, current spec is 5000 psi, 4000 psi for loading
	Job Specific - Cost	

10	What is the cost comparison versus typical stringers? How does the weight compare to typical stringers?	In general, the prices are comparable to stringer bridges. A lot depends on the market that you are in, including labor costs for deck forming and placement.
11	What is unit price?	Refer to PowerPoint presentation.
	NEXT Beam - Railing	
12	Please address, if possible, overhang reinforcement to withstand rail post anchorage crash forces to prevent beam repairs?	The top flange of a NEXT D is the structural deck of the bridge. The reinforcing in the top flange is designed as a CIP deck. The overhang is the same. The NEXT F has an 8 inch thick overpour that is also designed the same as a CIP deck.
13	Do you have a good section yet for a Precast/Prestressed Barrier Rail that is crash tested that us PCI members can use?	The ABC-UTC conducted a research project at ISU entitled "Development of Prefabricated Bridge Railings," which developed precast railing connection details. These details will be crash-tested under a pooled-fund project led by the Iowa DOT.
	NEXT Beam - Availability	
14	Can you please address availability of forms for this Tee beam in the Midwest? Also address initial costs to a fabricator.	Forms would be readily available since the manufacturers of forms ship throughout the US and Canada. Cost varies based on form type and length but rough cost will run between $300K to $500K.
15	Please discuss the availability of NEXT T's in your region. In 2015 in DC region, fabricators were not able to provide NEXT T's.	Currently there are 10 suppliers along the east coast. There are 13 states that have built NEXT beam bridges.
	NEXT Beam - Design	
16	Rehab methods and how to address salt & corrosion mitigation?	We have increased cover of the main prestress strand reinforcement when the member was developed. Calcium nitrite corrosion inhibitors can be used.
17	Are there any issues with cracking at the ends of the NEXT beams for longer spans? If so, how do you avoid it?	There is a small crack in the intersection of the web and flange. This is unique to a double-stemmed prestressed component. A corner bar shown on sheet NEXT 05 of the PCINE Guidelines is recommended to minimize the crack. Also on long spans top tension cracks at the end of the beam can occur for heavily prestressed designs. Keeping end stresses well below the cracking limit and adding top reinforcement are recommended. See Sheet 6 of the PCINE Guidelines. Note that the majority of the end cracks are encased in the diaphragm/curtain wall pour and the remaining exposed cracks can be sealed to ensure long-term durability.
18	Skew limitations? Can NEXT Beam flanges be curved to match curved alignment? Can straight bar laps with UHPC be used?	PCINE recommends a 20-degree skew. Skew can be larger but you will have the potential for longer cracks in the end zone. The largest skew is 45 degrees. Also NEXT D handles skews better then NEXT F or E. NEXT beam flanges can be curved to follow the roadway alignment. There is a detail on Sheet NEXT 10 of the PCINE guidleines for the UHPC connection.

19	Have contractors been trying to use spread box beams instead of Next Beams due to the cheaper cost in your area?	NO, solid prestress slabs are typical for 35-55 ft range. NEXT Beams up to 80ft.
20	What are the advantages of the NEXT beam compared with NEBT beam?	NEXT beams are for spans from 40 -80 feet. NEBT girders are for spans above 80 feet.
21	From a fabricator perspective, is there a preference for NEXT Beam "F" or NEXT Beam "D"?	From a production standpoint NEXT F beams are simpler to fabricate thus the form turnover rate is faster which would allow a fabricator to produce more beams in a given time period as compared to NEXT D beams. That being said, we produce far more NEXT D beams than F beams due to the speed of construction they provide.
	Other	
22	Has your team evaluated continuous basalt fiber / epoxies as more earth abundant reinforcement alternative? Or do you plan to?	A small research project with Maine DOT was conducted several years to determine if Basalt mesh would reduce end cracking. The results were not conclusive. Additonal research would be needed.
	Questions during Webinar	
23	Slide 17: Do you use/recommend epoxy-coated reinforcement and for the strand, too?	This is determined by the state. We have seen epoxy and stainless steel in the Northeast. Strand is typically black.
24	Do you have a photograph that shows a curved deck being formed in a casting bed?	Sheet 21 of the presentation by PCINE. Additional photo attached (see photo below Q&A Session pdf).
25	Are these continuous beams?	NEXT beams can be design for continuity. Strand extensions or rebar have been used. See case study in the PCINE presentation.
26	How do you take care of the cross fall in the bridge deck ?	Typically the NEXT beams are layed out with a joint at the crown of the cross slope or it's made up with the overlay.
27	Do they need any midspan diaphragm?	No midspan diaphragms are required.
28	Should more research be done on predicting camber in precast concrete sections?	With fabricators beginning to measure the modulus of elasticity of their concrete mixes we should be seeing more accurate predicted cambers.
29	Can you detail hooks extending out the end of the beam or does that interfere with removing the bulkhead?	Strand extension or rebar bent up after form removal is typically the way it is handled.
30	How is bridge superelevation accounted for?	Abutment seats vary in elevation at each stem.
31	Can you precast concrete barriers on the exterior tee beam for crash loading per AASHTO?	Design would not be any different. I would consider weight and shipping for an integral concrete rail.

32	Is Polyester Polymer Concrete (PPC) an acceptable material to be used for the closure pour?	Not aware of its use.
33	Forterra has the forms in AL and has produced for GA DOT.	Thank you for the update.