ABC Innovative Projects

I-85 / Kia Boulevard Bridge					
Location	CR 98 (Kia Boulevard) over I-85 in Troup County in west central Georgia				
State	Georgia				
Owner	State				
Year ABC Built	2008				
State ID #	285-5071-0				
NBI #	285-00309X-001.11E				
Coordinates	***Latitude:*** 32.929783		***Longitude:*** -85.108383		
Contact Person	Paul V. Liles, P.E. Assistant Division Director of Engineering Georgia Department of Transportation Phone: 404-631-1882 Email: pliles@dot.ga.gov				
Mobility Impact Time	***ABC:*** 16.5 months of I-85 shoulder closure		***Conventional:*** 30 months of traffic impact		
Impact Category	*Tier 1*	*Tier 2*	*Tier 3*	*Tier 4*	***Tier 5***
					X
Primary Driver(s)	• reduced traffic impacts • reduced onsite construction time • improved work-zone safety				
Description	• 384-ft-long and 119.25-ft-wide four-span prestressed bulb tee girder bridge (60 ft – 132 ft – 132 ft – 60 ft) • Rural location • Average Daily Traffic count: 8,600 (Kia Boulevard); 31,000 (I-85) • Traffic management alternative, if constructed conventionally: extended use of detour ***New Bridge:*** Each of the three interior substructures consists of eight 3.5-ft-square precast columns with four 4-ft-square precast pier caps joining two columns each. Abutments were conventional cast-in-place backwalls and wingwalls on steel H piles. The conventional superstructure cross-section consists of fourteen 72-inch-deep pretensioned bulb tee girders at 8.5-ft spacing in the 132-ft spans, and twelve AASHTO Type II pretensioned I-shaped beams at 8.5-ft spacing and 72-inch-deep bulb tee girder fascia beams in the 60-ft-long spans. Decks were cast-in-place after beam erection. ***Construction Method:*** The precast caps and columns were fabricated offsite in a controlled environment, shipped to the site using conventional semitrailers, and temporarily stored onsite after delivery. The contractor closed one lane of I-85 and offloaded up to four columns and pier caps at a time. Lane closure was kept to a minimum, normally for 1.5 hours or less, and occurred during non-peak traffic hours. Cast-in-place column footings were constructed ahead of time with protruding reinforcing steel that fit into a specialized coupler on the bottom of the columns. A bed of high-early-strength grout was placed on the footing to receive the column, the column was erected, and additional specialized grout supplied by the manufacturer was hand pumped into the coupler's inlet holes. The columns were then checked for alignment				

<table>
<tr><td></td><td>with surveying equipment. Two columns per day were set early in the project, increasing to four columns per day as experience grew.

The pier caps were placed on top of the columns similar to the way the columns were set on the foundations except that the specialized couplers in the pier cap were required to simultaneously line up with reinforcing bars from the two adjacent columns. A steel jig was placed on top of the neighboring column as they were set to ensure proper alignment. Once the alignment was checked with the jig, the contractor was able to set one interior substructure (four pier caps) in one day.

The Request for Proposal special provisions for this design-build project included an innovative contracting approach requiring the contractor to propose state-of-the-art methods to achieve specified performance goals, therein providing innovative recommended methods for monitoring and reporting various performance measures to achieve the Highways for LIFE goals. The Georgia DOT required the contractor to define the performance measure methods as project deliverables tied to an incentive-disincentive approach, which is unique in Georgia. Execution is as enforceable as any other deliverable in the contract. Data reporting assessment will help determine the performance measures for future Georgia DOT construction contracts.

Stakeholder Feedback:
The project showed that the use of precast elements was a viable technique for bridge construction. In particular, the grouted rebar splices worked very well. The Department will use this technique on other bridges as the need arises.</td></tr>
<tr><td>High Performance Materials</td><td>•</td></tr>
<tr><td>Photos

Additional photos</td><td colspan="3">    </td></tr>
<tr><td rowspan="2">Project Planning</td><td>Decision-Making Tools</td><td>Site Procurement</td><td>Procurement</td><td>Contracting</td></tr>
<tr><td>•</td><td>•</td><td>• Design-build</td><td>• Incentive / disincentive clauses</td></tr>
<tr><td rowspan="2">Geotechnical Solutions</td><td colspan="2">Foundations & Walls</td><td colspan="2">Rapid Embankment</td></tr>
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<tr><td rowspan="3">Structural Solutions</td><td colspan="3">Prefabricated Bridge Elements & Systems</td><td>Construction</td></tr>
<tr><td>Elements</td><td>Systems</td><td>Miscellaneous</td><td rowspan="2">•</td></tr>
<tr><td>• Precast caps and columns</td><td>•</td><td>• Bars in splice couplers
• Grouted ducts in precast substructure</td></tr>
<tr><td>Costs</td><td colspan="4">The engineer’s estimate for this project was $4.03 million. The low bid was $3.36 million ($670,000 = 16% lower than engineer’s estimate). There were four bidders. The cost per square foot of bridge was $74 compared to $88 for conventional construction in this region in 2008.

Estimated construction cost savings were $670,000 relative to conventional</td></tr>
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	construction. In addition, the project was constructed in only 16.5 months, resulting in estimated delay-related user cost savings of $550,000 and safety cost savings of $750,000 for a total estimated savings of $2 million.			
Funding	*Federal only*	*State only*	***Federal and State***	*Other*
			X	
Incentive Program ($)	***Highways for LIFE***	*IBRD*	*SHRP2*	*Other*
	$1 million			
Contract Plans	**Complete Set:**	Bridge Plans (link to pdf) Costing Plans for D-B (link to pdf)	**ABC *:**	
Specifications	**Complete Set:**	Proposal (link to pdf) D-B Specification (link to pdf)	**ABC *:**	
Bid Tabs	Bid Tabs (link to pdf)			
Schedule	**Engineer's:**	Not available.	**Actual:**	
Other Related Information	November 2009 Highways for LIFE Final Report [http://www.fhwa.dot.gov/hfl/summary/ga/]			
Photo Credits	Georgia Department of Transportation			

* Specific to the ABC used in the project.