


ABC Innovative Projects

I-5 / South 38th Street Bridge					
Location	South 38 th Street over I-5 in the city of Tacoma in Pierce County				
State	Washington				
Owner	State				
Year ABC Built	2001				
State ID #	5/430				
NBI #	0015935A000000				
Coordinates	Latitude:	47.223333	Longitude:	-122.461667	
Contact Person	Jugesh Kapur, P.E. State Bridge and Structures Engineer Washington State Department of Transportation Phone: 360-705-7207 Email: kapurju@wsdot.wa.gov				
Mobility Impact Time	ABC:	Partial-depth deck panels placed within one week with limited nighttime I-5 lane closures	Conventional:	Additional weeks of I-5 lane closures for full-depth CIP deck	
Impact Category	<i>Tier 1</i>	<i>Tier 2</i>	<i>Tier 3</i>	<i>Tier 4</i>	Tier 5 X
Primary Driver(s)	<ul style="list-style-type: none"> • reduced traffic impacts • reduced onsite construction time • improved work-zone safety • improved site constructability • improved material quality and product durability • minimized environmental impacts • reduced life-cycle cost 				
Description	<ul style="list-style-type: none"> • 325-ft-long and 106-ft-wide two-span prestressed trapezoidal tub girder bridge (160.75 ft -164.25 ft) • Urban location • Average Daily Traffic count: 248,000 on I-5 (2010-year) • Traffic management alternative, if constructed conventionally: extended use of lane closures <p>Existing Bridge: The existing four-span bridge was replaced to add capacity near a high-traffic-volume shopping mall interchange.</p> <p>Replacement Bridge: The replacement bridge has 11.8-ft-wide traffic lanes and 11.8-ft-wide shoulders. The cross-section consists of 10.3-ft-wide 5.8-ft-deep precast post-tensioned open-top trapezoidal beams spaced at 18 ft with an 8-inch-thick composite deck consisting of 3.5-inch-thick partial-depth deck panels and 4.5-inch-thick cast-in-place concrete topping. The substructures were conventional concrete columns founded on spread footings.</p> <p>Construction Methods: To reduce construction time and minimize traffic disruption, the Washington State Department of Transportation chose partial-depth precast stay-in-place deck panels in</p>				

	<p>the design of this replacement bridge over I-5 in Tacoma. The new post-tensioned box girder bridge uses precast tub girder segments. With no need to construct and remove conventional deck forms, lane closures on I-5 were greatly reduced. Leveling screws were used to adjust camber on the 3.5-inch-thick precast pretensioned panels, and all 766 panels were placed within a week of limited nighttime I-5 lane closures.</p> <p>The open-top precast trapezoidal box girder segments were erected with three segments per span. The 3-ft-wide transverse closure joints between segments, supported on falsework, were cast with partial-height intermediate diaphragms between segments. The partial-depth precast deck panels were then erected and adjusted with leveling screws. Grout was placed below the panels to provide continuous support. The composite deck topping was cast, and girder segments were longitudinally post-tensioned together.</p> <p>The contract allowed a maximum closure of 227 working days. Onsite work, including temporary closures, was to begin January 3, and the bridge was to be re-opened to traffic by midnight, September 15. In addition to the standard liquidated damages clause, the contract included a disincentive of \$8,000 per day for failure to open all lanes of traffic on the bridge and ramp by 12:01 am, September 15. In addition for closures beyond the scheduled opening time, liquidated damages were assessed per 15 minutes prorated to the nearest five minutes as follows:</p> <ul style="list-style-type: none"> • \$50 to \$300 for each ramp • \$2,500 for single and double lane closures on northbound mainline SR 5 • \$1,100 for single, double and triple lane closures on southbound mainline SR 5 <p>The contract required weekly meetings of key contractor and WSDOT personnel.</p>			
High Performance Materials	<ul style="list-style-type: none"> • 			
Photos				
Additional photos				
Project Planning	<i>Decision-Making Tools</i>	<i>Site Procurement</i>	Project Delivery	Contracting
Geotechnical Solutions	<i>Foundations & Walls</i>		<i>Rapid Embankment</i>	
Structural Solutions	Prefabricated Bridge Elements & Systems			<i>Construction</i>
Costs	<i>Elements</i>	<i>Systems</i>	<i>Miscellaneous</i>	
Funding	<i>Federal only</i>	State only	<i>Federal and State</i>	<i>Other</i>

		X		
Incentive Program (\$)	<i>Highways for LIFE</i>	<i>IBRD</i>	<i>SHRP2</i>	<i>Other</i>
Contract Plans	Complete Set:	As-built Plans (link to pdf)	ABC *:	
Specifications	Complete Set:	Amendments & Special Provisions (link to pdf)	ABC *:	
Bid Tabs	Not available.			
Schedule	Engineer's:	Not available.	Actual:	
Other Related Information	FHWA Connections Manual for PBES Details 2.1.5.2C, 2.3.2.2A, 2.5.1B May 2002 AASHTO TIG / FHWA Prefabricated Bridges: "Get In, Get Out, Stay Out" (link to pdf)			
Photo Credits	Washington State Department of Transportation			

* Specific to the ABC used in the project.