


ABC Innovative Projects

Oak Creek Bridge					
Location	On US 89A at milepost 381.32 in Coconino County south of the city of Flagstaff				
State	Arizona				
Owner	State				
Year ABC Built	1992				
State ID #	2264				
Federal ID #	BRS-366(11)P				
Coordinates	Latitude: 34.945000		Longitude: -111.753333		
Contact Person	Jean A. Nehme, Ph.D., P.E. State Bridge Engineer Arizona Department of Transportation Phone: 602-712-7481 Email: Jnehme@azdot.gov				
Mobility Impact Time	ABC: Weekend closure		Conventional: four months of traffic impacts		
Impact Category	<i>Tier 1</i>	Tier 2	<i>Tier 3</i>	<i>Tier 4</i>	<i>Tier 5</i>
		X			
Benefits	Reduced traffic impacts, minimized environmental impacts				
Description	<ul style="list-style-type: none"> • 190-ft long and 41.17-ft wide single-span post-tensioned concrete box girder bridge slide-in • Rural location • Average Daily Traffic count: Oak Creek Canyon is visited by an estimated two million tourists each year • Traffic management alternative, if constructed conventionally: 80-mile detour <p>Existing Bridge: The existing 23.33-ft-wide steel deck truss bridge had two 10-ft-wide lanes. It connected the north and south side of Oak Creek Canyon. Built in 1933, the 20-ft-wide bridge was too narrow to safely accommodate current traffic needs and had to be replaced.</p> <p>Replacement Bridge: The two-lane replacement bridge has two 4-ft-wide shoulders and a 5-ft-wide sidewalk. The cross-section consists of two 11-ft-wide post-tensioned concrete box girder cells that vary in depth from 8.5 ft to 16.0 ft, with a 9-inch-thick deck that cantilevers approximately 9.5 ft on each side. It was designed to resemble the old Lutén Arch bridge with the use of architectural effects and rock wall facing on the new abutments. In order to avoid closing the highway and forcing motorists on an excessively long detour, ADOT drew on a design from the past and coupled it with an innovative technology from today. The result was a permanent concrete bridge that was built at one location and moved laterally into place.</p> <p>Construction Methods: The project was done in three phases. Stage one called for keeping traffic on the old bridge, excavation, removing the existing southwest wing wall and replacing with temporary shoring. Also, new abutments were built about three feet west of the existing bridge and the new box girder superstructure was built along with a new northwest retaining wall.</p>				

	<p>In stage two, traffic was detoured onto the new bridge while the existing southeast retaining wall and wingwall and the old bridge were demolished. All debris was contained and none was allowed to fall into the creek. Sections of the approach slab were also built in stage two.</p> <p>Stage three involved finishing the approaches, demolishing the temporary abutments, and moving the new bridge laterally 26.33 ft into position using bearings coated with Teflon.</p>			
High Performance Materials	<ul style="list-style-type: none"> • 			
Photos				
Project Planning	<i>Decision-Making Tools</i>	<i>Site Procurement</i>	Project Delivery	Contracting
	•	•	• Design-bid-build	• Full lane closure
Geotechnical Solutions	<i>Foundations & Walls</i>		<i>Rapid Embankment</i>	
	•		•	
Structural Solutions	Prefabricated Bridge Elements & Systems			Construction
	<i>Elements</i>	Systems	<i>Miscellaneous</i>	• Skids
	•	• Full-width beam span with deck	•	
Costs	The cost per square foot of bridge was \$148 compared to \$42 for conventional construction in this region in 1992.			
Funding	<i>Federal only</i>	<i>State only</i>	Federal and State	<i>Other</i>
			X	
Incentive Program (\$)	<i>Highways for LIFE</i>	<i>IBRD</i>	<i>SHRP2</i>	<i>Other</i>
Contract Plans	Complete Set:	Contract Plans (link to pdf)	ABC *:	
Specifications	Complete Set:	Not available.	ABC *:	
Bid Tabs	Not available.			
Schedule	Engineer's:	Not available.	Actual:	
Other Related Information	ADOT Bridge Group website [http://www.azdot.gov/Highways/Bridge/index.asp]			
Photo Credits	Arizona Department of Transportation			

* Specific to the ABC used in the project.