


ABC Innovative Projects

I-215 / 4500 South Bridge					
Location	4500 South (SR-266) over I-215 in Salt Lake City				
State	Utah				
Owner	State				
Year Built	2007				
State ID #	F-I215(126)13				
NBI #	0C 953				
Coordinates	Latitude: 40.6741672		Longitude: -111.802500		
Contact Person	Carmen Swanwick, P.E. Chief Structural Engineer Utah Department of Transportation Phone: 801-965-4981 Email: cswanwick@utah.gov				
Mobility Impact Time	ABC: weekend closure of I-215 (53 hours) 10-day closure of 4500 South		Conventional: 40-50 weeks of construction-related congestion		
Impact Category	<i>Tier 1</i>	<i>Tier 2</i>	<i>Tier 3</i>	<i>Tier 4</i>	<i>Tier 5</i>
		I-215	4500 South		
Primary Driver(s)	reduced onsite construction time; reduced traffic impacts; improved work-zone safety; improved site constructability; improved material quality and product durability				
Description	<ul style="list-style-type: none"> • 172-ft long and 82-ft wide single-span bridge roll-in; 1,600-ton self-weight • Urban location • Average Daily Traffic count: 66,000 for I-215 and 15,000 for SR 266 • Traffic management alternative, if constructed conventionally: extended detour <p>Existing Bridge: Four-span bridge (F-156) 244-ft-long and 77.2-ft-wide. Built in 1971, it had a deteriorated superstructure and substructure that required replacement in 2007.</p> <p>Construction Methods: The replacement superstructure was built near site on temporary supports while the replacement abutments were built below the existing bridge with I-215 traffic maintained. The abutments were built on cast-in-place spread footing foundations with full-height cast-in-place wingwalls while 4500 South traffic remained operational. Free-draining backfill was used to minimize needed compaction behind the abutments. The free-draining backfill used a prescriptive compaction method with a vibratory roller; no compaction tests were required.</p> <p><i>Friday Evening</i> I-215 and the 4500 South bridges were closed.</p> <p><i>Saturday</i> The two existing spans crossing I-215 were removed in seven hours with self-propelled modular transporters (SPMTs), while the two smaller existing end spans and substructures were demolished conventionally.</p> <p><i>Sunday</i></p>				

	<p>SPMTs moved the replacement superstructure into place. The removal and replacement took 53 hours over a weekend; the move would have taken less time but was delayed to allow for daylight observance of the move by showcase participants.</p> <p><i>Monday morning 3 a.m.</i></p> <p>I-215 was reopened to traffic with the 4500 South Bridge reopened 10 days later. Precast approach slabs helped speed the bridge reopening.</p> <p>Stakeholder Feedback:</p> <p>Construction Manager General Contractor (CMGC) was critical to making this project successful in the extremely short amount of planning and construction time allotted. Use of CMGC allowed the contractor and designer to work in a collaborative manner at the early part of the planning stage to seek improved constructability solutions.</p>			
High Performance Materials	<ul style="list-style-type: none"> • Lightweight concrete deck 			
Photos	 <p>Additional photos</p>			
Project Planning	Decision-Making Tools	<i>Site Procurement</i>	Project Delivery	Contracting
	<ul style="list-style-type: none"> • State process 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • CMGC 	<ul style="list-style-type: none"> • Full lane closure
Geotechnical Solutions	Foundations & Walls		Rapid Embankment	
	<ul style="list-style-type: none"> • CIP abutment under traffic 		<ul style="list-style-type: none"> • Self-compacting backfill 	
Structural Solutions	Prefabricated Bridge Elements & Systems			Construction
	<i>Elements</i>	Systems	Miscellaneous	
	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Full-width beam span with deck 	<ul style="list-style-type: none"> • Precast approach slab • Lightweight concrete deck 	
Costs	<p>The project cost was approximately \$7.0 million which includes \$2.5 million associated ABC costs. The SPMT cost was approximately \$800,000 with the additional money for temporary soil nail walls, grading of the staging area, temporary abutments, temporary abutment containers, permanent abutment configuration, and additional labor.</p> <p>The use of ABC saved \$4.0 million in user costs.</p>			
Funding	<i>Federal only</i>	<i>State only</i>	Federal and State	<i>Other</i>
			X	
Incentive Program (\$)	Highways for LIFE	<i>IBRD</i>	<i>SHRP2</i>	Other
	\$1 million			ARRA
Contract Plans	Complete Set:	4500 So Project Plan Set_07/05/07 (link to pdf)	ABC *:	
Specifications	Complete Set:		ABC *:	Special Provision 03253S Bridge Construction Using SPMTs (link to doc) Special Provision 02223S Remove

				Bridge (link to pdf) Special Provision 02988S Structure Move-In (link to pdf)
Bid Tabs	Quantity and Amount Placed (link to pdf)			
Schedule	Engineer's:	4500 So Schedule 04/24/07-changes not updated (link to pdf)	Actual:	
Other Related Information	April 2009 Highways for LIFE Final Report [http://www.fhwa.dot.gov/hfl/summary/ut0409/] December 2007 FHWA FOCUS [http://www.fhwa.dot.gov/publications/focus/07dec/01.cfm] UDOT ABC website [http://www.udot.utah.gov (Inside UDOT / Project Development / Structures Design and Bridge Operations / ABC)]			
Photo Credits	Utah Department of Transportation			

* Specific to the ABC used in the project.