

# The Morris Street Bridge Rehabilitation

By Dave Sawyer

In 2009, the Indiana Department of Transportation (INDOT) and the city of Indianapolis began planning for the rehabilitation of the Morris Street Bridge, one of the oldest in the city. Located in the central-west area of Indianapolis, the bridge was originally built in 1929 to facilitate vehicular traffic over the White River (part of the Mississippi network of rivers) into and out of the downtown core. Because it handles a flow of approximately 10,000 vehicles daily, its importance to modern-day traffic flow remains high, underlining the urgency for its rehabilitation.



Overview of the Morris Street Bridge project

The project was eventually awarded to Beaty Construction from nearby Boggsstown, IN. The concrete rehabilitation portion of the project, accounting for roughly \$1.7 million of the \$7.85 million contract, was then awarded to RAM Construction of Livonia, MI, just west of Detroit.

RAM's scope of work called for rehabilitation of abutment walls, wing walls, arch spans, and piers. They were required to remove and repair damaged areas, re-rod or apply wire mesh and galvanic anodes before beginning the concrete rehabilitation and fiber-wrap processes. The bridge, measuring 112 ft (34 m) wide and 654 ft (200 m) long, required a significant number of repairs, some of which required up to 14 in. (356 mm) of concrete replacement. The base bid was divided into two options: form and pour a 4 in. (100 mm) encasement over all the arches or repair the arches using shotcrete and install a glass fiber wrap over all the arches. Bids for the shotcrete and fiber-wrap option showed substantial cost savings over the form-and-pour approach. RAM offered pricing for the repair of the arches using their preferred method of concrete placement: shotcrete.

The project began in earnest in the spring of 2011. Although the schedule allowed for completion of the shotcrete by the end of the 2011 calendar year, RAM was determined to finish sooner. The schedule, however, experienced a severe and



Areas repaired using the dry-mix shotcrete process included bridge piers



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*Repair access on the underside of the bridge spans using scissor lifts*

unavoidable setback in April and May when the White River flooded its banks around the bridge up to 8 ft (2.4 m), completely submerging the floodplain work area and some of the construction equipment, and effectively shutting down all repair operations for a number of days. Despite the delays caused by the flood, RAM shotcrete crews were able to make up for lost time by accelerating their rate of production. Shotcrete placement was completed by late October 2011.

The entire project used approximately 500 bulk bags of King Packaged Materials' MS-D1 and MS-D3 Accelerated Shotcrete, amounting to approximately 305 yd<sup>3</sup> (234 m<sup>3</sup>) of concrete replacement. A key factor in RAM's ability to meet the difficult scheduling demands was the company's strategy to use King's MS-D3 Accelerated Shotcrete for the initial part of each repair. The use of this material provided shorter initial and final set times and accelerated strength gain, allowing RAM shotcrete crews to build up areas much more quickly. This material was placed to within an inch of the eventual finished surface. RAM then went back to each repair area and finished shooting with King's MS-D1 Shotcrete, which, because of longer set times, allowed RAM to smooth-finish the repairs much more easily and professionally. After mid-September, cooler weather prompted RAM to shoot exclusively with King's MS-D3 Accelerated Shotcrete. To achieve a satisfactory finish, the concrete finishers were positioned immediately behind the shooting crew.

Despite the delays caused by flooding in the spring, RAM's portion of the contract was completed by the end of October 2011—well ahead



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*RAM used ACI-certified nozzlemen for all shotcrete placement*

of schedule. The accelerated schedule was made possible because of the time savings offered by the shotcrete process, the flexibility offered by different prepackaged shotcrete mixtures, and the experience and dedication of the RAM shotcrete crews. The repairs made the 80-year-old bridge structurally sound while addressing the aesthetic concerns of the local residents. RAM Construction Services is proud of this Morris Street Bridge shotcrete success story and looks forward to many more of the same.



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