

South Dakota 16A near Mount Rushmore National Memorial

>>> MAINTAINING A HISTORIC TOURIST ROUTE

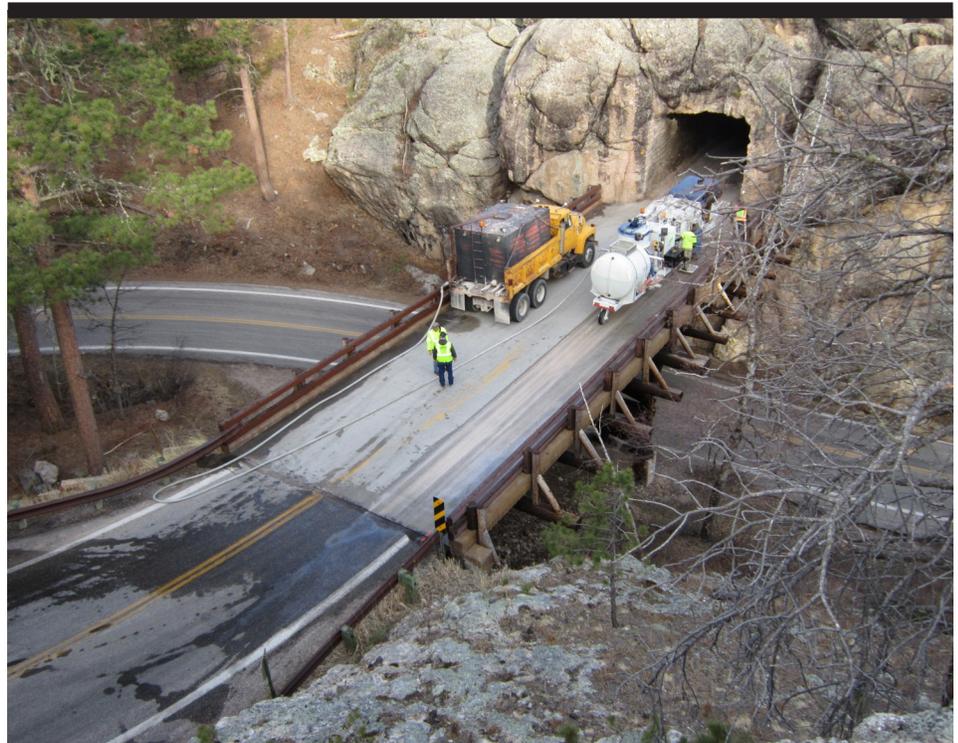
IRON MOUNTAIN ROAD – South Dakota’s historic route 16A – serves Custer State Park and the Mount Rushmore National Memorial, which is visited by nearly 3 million people each year. The road itself is part of the tourist experience; tunnels cut into rock outcroppings frame views of the famous carvings and ‘pig-tail’ bridges spiral between the narrow roads.

Maintaining the historic route using modern equipment and techniques — without altering its character — was a challenge confronted by repair crews who undertook its resurfacing in early 2014. The \$4,334,109 project called for milling and resurfacing 17 miles of roadway, together with bridge repair. Construction had to be completed within a narrow window of time in which temperatures were warm enough to accomplish the roadwork but the summer tourist season would not be disrupted.

REPAIRING BRIDGES WITH EPOXY CHIP SEAL

By mid-April, repair efforts on four pigtail bridges were underway. The repair method chosen was a two-coat bridge deck epoxy chip seal, a favored method of bridge repair when dealing with worn decks because it seals micro-cracks in the concrete decking, protecting the structure’s rebar from salts. The epoxy resin also binds well with concrete decking on the bridge. Cover aggregate provides skid resistance, improving the safety of the roadway. Epoxy chip seal’s easy application process and the fast cure time also help keep project schedules on track.

SDDOT specifications require diamond grinding of bridge decks in preparation for the placement of epoxy chip seal overlays. Grinding eliminates existing tining and irregularities in the road surface. A ground profile affords a clean and uniform surface, improving the adhesion of the chip seal coating. The existing surface on the 16A bridges had been in place since 1991 and was very rough, so grinding the surface improved its overall smoothness.



“The process of grinding bridges and applying an epoxy chip seal wearing course is a fast and easy way to extend the life of bridges,” said Rory Heizelman, project engineer at SDDOT. “In South Dakota, this repair method has been seeing increased use in the past few years. It also has a lesser impact on the traveling public than some other repair methods.”

GETTING THE JOB DONE

Considering that a full size Target Model PR 3800 grinder was used on the bridges, navigating the road’s narrow lanes, elevation gain and tight curves was a challenge. All road repair equipment also had to be kept out of the state and national parks, so bypass routes were all that were available for crews to use. Two grinder operators were required in order to control the accuracy of the grinding process. The regular grinding machine was unable to maintain blade contact in areas near the bridge where the turning radius was tight and its use would have resulted in a gap of

TEAM MEMBERS

- J.V. Bailey Co., Inc. (Prime contractor)
- Diamond Surface, Inc. (Grinding contractor)
- Hilti - North America (Blade supplier)
- Washington Rock Quarries (Materials supplier)
- Poly-Carb (Materials supplier)

several inches along the turns. In these areas the grinding contractor, Diamond Surface, Inc., used a close proximity grinder built by the company.

Early repair work remained on schedule, allowing for unrestricted road travel during the tourist season and permitting the DOT to move forward in the early fall with additional repairs and maintenance of associated roadways. Bridge repair work is expected to add 12 to 15 years to the life of the structures.