

CPR: REBUILT TO LAST

US Route 33, Appalachian Corridor H, Barbour, Upshur, and Randolph Counties, W.V.

>>> CONCRETE PAVEMENT PRESERVATION AND RESTORATION, FULL AND PARTIAL DEPTH REPAIRS, DIAMOND GRINDING

U.S. ROUTE 33 is a highway running northwest-southeast for 709 miles from northern Indiana to Richmond, Va. A four-lane portion of the divided highway runs from Weston to Elkins, W.V., the majority of which consists of exposed jointed plain concrete pavement (JPCP). Currently, several sections of the existing JPCP road have been identified by the West Virginia Division of Highways (WVDOH) for various preservation and/or restoration techniques based on age and condition.

A 21-year-old 4.20-mile section in Upshur County exhibited distressed areas in need of repair. Most of the joint seals have started to or have already deteriorated. Additionally, the asphalt shoulders along this stretch are extremely deteriorated. Full depth and partial depth repair techniques were chosen for this project. After the isolated repairs are completed and the shoulders milled and replaced to a depth of four inches with new hot mix asphalt (HMA), the road will be diamond ground for profile and all of the joints resealed. This project is being done at a cost of approximately \$2.1 million (\$500,000 per center-line mile) and represents a combination of preservation and repair applications.

Another section further west in Barbour County is 4.43 miles long and approximately 20 years old. The road is in generally good condition with only a handful of distressed pavement areas. After the isolated repairs are completed, the road will be diamond ground for profile and all of the joints resealed. This project is being completed at cost of approximately \$750,000 (\$170,000 per center-line mile). The WVDOH feels that based on the level of pavement distress, this project represents a true, early stage pavement preservation application.

The last section being worked on is a 4.29-mile section near Elkins in Randolph County. This section of road is approximately 20 years old,



Spalling at transverse joint - location to be repaired with partial depth repair techniques.



High severity spalling at transverse joints - sections of the project with spalling this severe at each joint were removed and replaced.

but displays high levels of distress. Maintenance forces have been routinely sought to make small patches and keep transverse joints passable by filling them with hot-pour joint seal. However, the extent of the deterioration has prevented the sealant from lasting through one winter in many cases. As a result, the WVDOH chose several pavement preservation and rehabilitation techniques to provide a long-term solution for travelers.

The project involves an extensive scope of concrete preservation techniques including partial depth repairs at both transverse and longitudinal joints, full depth repairs, some sections of removal and replacement, shoulder removal and replacement, diamond grinding and resealing of the joints.

According to Thomas Medvick, PE, pavement engineer at WVDOH, the overall goal of these projects is to incorporate pavement preservation techniques.

“In the past, combined use of early stage preservation techniques like these was not considered and a lot of this work would have been ignored and delayed. Our goal is to strategize with the road conditions in mind and embrace concrete pavement repair techniques for long-term benefits,” said Medvick.

The winding roadway, varying grades and undulating terrain present many challenges and

TEAM MEMBERS

- WVDOH – Owner
- Chester Bross Construction – Concrete pavement repairs and diamond grinding
- West Virginia Paving – Shoulder improvements

require additional safety measures to be taken because of reduced sight distance. Additionally, the area typically experiences temperature variations as much as 40 degrees Fahrenheit during spring and fall. This scenario impacted both construction start dates on these jobs and some construction materials selection.

“We are typically seeing reductions in IRI of 50-70 percent, and in some cases even more on these and CPR projects. On these specific projects we are seeing almost 70% reduction with final IRI values in the mid-40s,” said Medvick.

The total cost for these three projects is approximately \$7.35 million which translates to an average cost of approximately \$570,000 per center-line mile. Compared to more traditional methods, the WVDOH feels that the application of these techniques represents an effective combination of treatments to treat a significant portion of this corridor and provide long-term performance at a relatively lower cost.