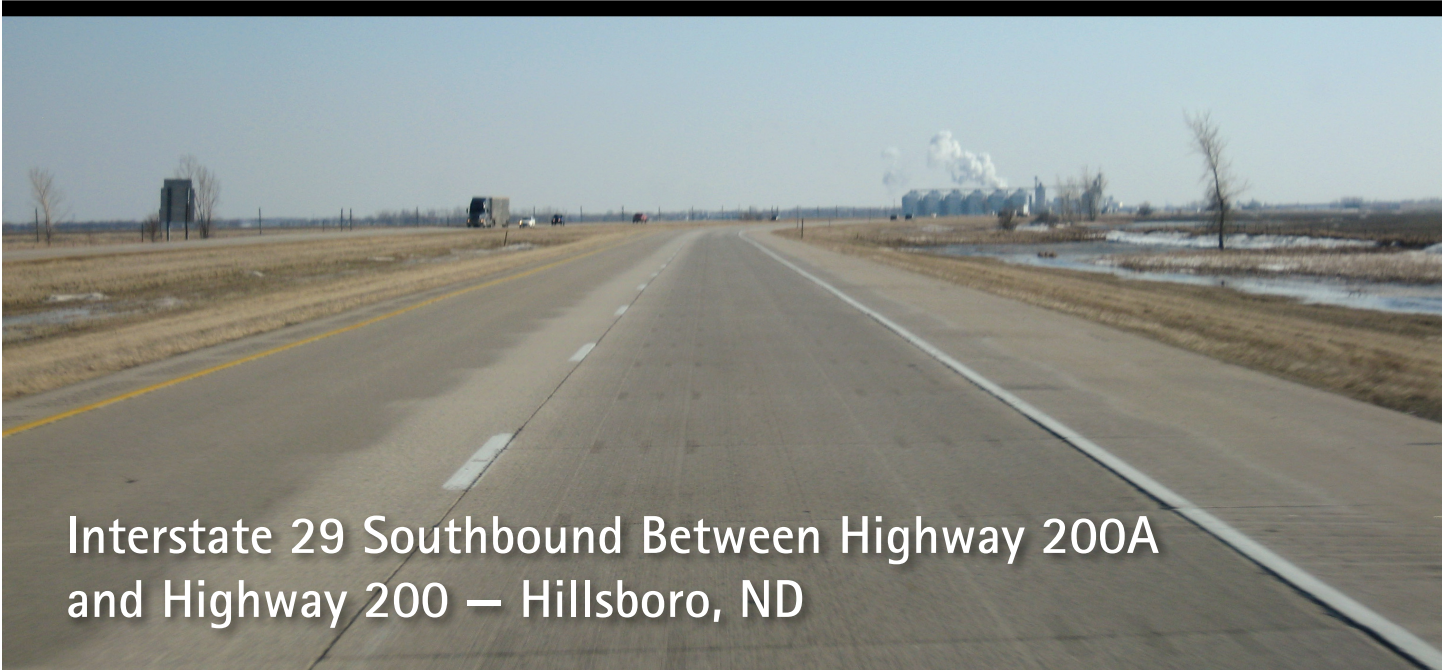


CPR – REBUILT TO LAST



Interstate 29 Southbound Between Highway 200A and Highway 200 – Hillsboro, ND

>>> DIAMOND GRINDING & DOWEL BAR RETROFIT

IN 1999, THE NORTH DAKOTA DEPARTMENT of Transportation (NDDOT), assisted by Ultieg Engineers, oversaw a complete pavement restoration project on southbound Interstate 29 between Highway 200 east and 200 west (MP 99.812 to MP 110.952). The roadway structure utilized Portland cement concrete pavement and consisted of two 12-foot lanes along with a 4-foot inside and a 10-foot outside shoulder. The transverse joints were constructed with a skew and finished with compression seals. The pre-rehabilitation conditions of the roadway included transverse joint faulting that ranged from 1/4-inch to 3/8-inch in the truck lane and little to no faulting in the passing lane. There were a few isolated areas that contained broken and dropped panels.

The 11.092-mile project entailed complete concrete pavement restoration (CPR) including full- and partial-depth concrete repairs, dowel bar retrofit (DBR) to restore load transfer, diamond grinding to restore ride and skid resistance, and joint re-sealing to prevent the intrusion of water and incompressibles. Full- and partial-depth repairs were performed on both the truck lane and the passing lane, while DBR was only performed on the heavily faulted truck lane. Diamond grinding was performed on the truck lane followed by a single

diamond ground feather pass on both the outside shoulder and passing lane to help blend the ground and unground areas. All areas that were diamond ground had the joints resealed with silicone sealant. In addition to providing a smooth and quiet driving surface, the use of CPR and diamond grinding on this project also increased the pavement's friction characteristics providing taxpayers with a safe, comfortable and cost effective roadway. The total cost of construction was approximately \$1.5 million, and the CPR portion of the project was approximately \$1.3 million, or \$56,525 per lane mile.

Completed in the fall of 1999, the I-29 project was unique and innovative as the NDDOT demonstrated the flexibility and cost effectiveness of the CPR process by targeting only the most deteriorated sections of the pavement thereby stretching their dollars for more miles. The truck lane's current smoothness measured by International Roughness Index (IRI) is 62 inches per mile. In contrast, the left lanes, which did not utilize DBR to restore load transfer, now have an IRI of 140 inches per mile. This contrast demonstrates the effectiveness of DBR in restoring sustained load transfer and preserving our highways in a smooth, safe fashion. By utilizing these concepts in the left lane, the life of this pavement can be extended even further.

TEAM MEMBERS

- North Dakota Department of Transportation (Owner)
- Penhall Company (Prime contractor)
- Ultieg Engineers (Project inspection)
- Border States Paving (Bituminous)
- Dakota Fence (Signs and guide rail)
- Landstar Construction (Erosion control)
- Sand Creek Corp. (Dirtwork and pipe)
- 3D Specialties (Traffic control)
- Tri-State Striping (Striping)
- Wanzek Construction (Bridge work)