

CPR – REBUILT TO LAST



Minnesota Department of Transportation Utilizes Full CPR Toolbox and Diamond Grinding

>>> FULL CPR AND DIAMOND GRINDING

LOCATED 90 MINUTES NORTHWEST of Minneapolis, Minn., the counties of Stearns and Wright are collectively home to approximately 250,000 residents. The existing conditions of I-94 from Stearns County State Aid Highway 75 to Trunk Highway 241 were poor. With an International Roughness Index (IRI) in excess of 200 inches per mile, the road had faulted joints ranging from 1/4-inch to 1/2-inch. To remedy this, the Minnesota Department of Transportation (MNDOT) opted to utilize full- and partial-depth patching, grinding, joint and crack sealing, asphalt ramp paving and striping to the 85 lane mile section. The project included 633,000 square-yards of diamond grinding and 5,333 square-yards of the newly introduced Next Generation Concrete Surface (NGCS), an innovative surface texture designed to provide a consistent, low noise surface absent of positive or upward texture. Although an asphalt overlay was considered, this approach would have required additional yet unnecessary paving on the shoulders to maintain profile, as well as the necessity of addressing height issues such as bridges and guide rails. Since the shoulders were in good condition, MNDOT pursued the more economical Concrete Pavement Restoration (CPR) solution.

This was the first time that MNDOT utilized a full CPR toolbox and diamond grinding on this stretch of I-94. The team used maturity meters, an electronic device embedded in a new patch to

measure its strength. This innovative device allowed the patches to be open to traffic as soon as the specified strength was met, unlike the traditional cylinder approach. When patching, the team used a five-hour mix design to get the full 3,000 psi strength in patches for full- and partial-depth work. Because of the short amount of time allowed for traffic closures, full strength had to be met as quickly as possible.

“The grinding on I-94 really improved the ride, especially when towing trailers with equipment on them. I noticed a drop in the noise level in my vehicle,” said Ron Chihos, Owner, General Rental in Monticello.

The non-negotiable completion date mandated night work and a six-day work schedule. Working hours were limited as the road needed to be open to traffic every morning. Weather also proved to be a challenge as the project had many days with heavy rain and cold temperatures, making it difficult to place any concrete patches.

Construction began on May 11 and was completed ahead of schedule on July 23, 2009. The total value of the project was \$5.9 million. The result for taxpayers is a solution expected to last ten years. The resulting IRI of the road, measured at 52.45 IRI, improved by approximately 77 percent.

TEAM MEMBERS

- Minnesota Department of Transportation (Owner)
- Diamond Surface, Inc. (Patching and grinding)
- Imholte Concrete Construction, Inc. (Full depth patching, sawing and sealing joints)
- Penhall Company (NGCS and grinding)
- Highway Technologies (Striping)
- Knife River (Ready-mix)
- Hardrives (Asphalt shoulders)
- Simplex Construction Supplies, Inc. (Material supplier)
- Diamond B and Norton Pro Diamond (Diamond grinding blade suppliers)
- Geyer Signal (Traffic control)