

# CPR: BUILT TO LAST



## U.S. 52 Intersection Improvements and Resurfacing at Interstate 95, Florence, S.C.

### >>> FULL-DEPTH CONCRETE REPLACEMENT WITH DIAMOND GRINDING

U.S. 52 at the intersection of Interstate Highway 95 in Florence, S.C. had experienced multiple asphalt surface repairs over the years to no avail. As a highly traveled roadway, the existing wheel paths in the asphalt pavement were rutted as much as three inches where heavy truck traffic had applied their brakes when entering/exiting Interstate 95, and required frequent maintenance. In an effort to provide a long-lasting surface for travelers, the South Carolina Department of Transportation (SCDOT) decided to replace portions of the existing asphalt pavement with a full-depth concrete inlay – an innovative approach to solving their long-standing problems at this location.

The project involved removal of the existing asphalt surface, some of which had been placed on top of the original concrete roadway and some over the Hot Mix Asphalt (HMA) widening portion, and replacing it with a full-depth jointed concrete pavement. There were three distinct areas that received this repair with a total of 16 inlay sections. The average placement length was 750 feet long by 12 feet wide. The project required approximately 3,999 cubic yards of high early strength concrete utilizing 850 pounds of cement per cubic yard.

The asphalt was removed with the use of milling machines at depths varying from 8-10 inches. Next, the full depth repair areas were cleaned followed by dowel and tie-bar installation prior to high early strength concrete placement. Upon completion of the full-depth concrete inlay sections in the intersections, the remaining asphalt pavement was milled two inches deep and resurfaced with HMA. The concrete pavement was then diamond ground for superior smoothness, safety and a quiet ride.



“There were several challenges to performing the grinding on the project, due to the busy interchange and having to work around the traffic at the two truck stops and various obstructions at the I-95 exit. In the end, the diamond ground concrete pavement provided a pleasing ride and a long lasting solution for the owner and taxpayers alike,” said Curtis McCoin, Superintendent at Safety Grooving & Grinding LP. “The diamond grinding greatly enhanced the smoothness of the concrete pavement and produced a quieter texture.”

One of the main challenges was that work had to be performed at night during cool weather conditions in the fall of 2011, making high early concrete strength gain more difficult. Another challenge was the limited lane closure time frames that the roadway allowed. All pavement removal and paving work was performed over the course of 16 nights, with multiple nights of site preparation and joint sealing prior to and after the completion of heavy repairs.

After setting up the traffic control, several steps had to be completed prior to the first pour. These steps included marking out patch areas, milling, saw cutting the edges, cleaning the milled area, drilling for tie bars installation and placing and anchoring the dowel baskets. All of this was accomplished before the first placement at 10 p.m. with the final placement commencing before

#### TEAM MEMBERS

- South Carolina Department of Transportation (Owner)
- Palmetto Paving (Prime contractor)
- Safety Grooving and Grinding LP (Diamond grinding)
- Southeast Pavement Services, a Division of Reeves Construction Company (Full-depth concrete repair)

midnight. The greatest challenge was completing all of the necessary removal and preparation activities in time to allow for concrete placement and the required cure time for the high early strength concrete. Prior to reopening the site to traffic the following morning, the surface was cured, green sawed and cleaned up.

The total project value was \$4,840,000. The results were a long-lasting solution to a reoccurring rutting issue. By replacing the asphalt surface with concrete, the SCDOT has eliminated the need to commit scarce resources to continually make repairs to this intersection. It is estimated that the new concrete inlay will last for more than 25 years. The project was completed in December, 2011.