CPR – REBUILT TO LAST

Your Pavement Preservation Resource

Interstate 10, San Bernardino, CA

>>> PARTIAL-DEPTH REPAIR

Photo: CeraTech, Inc.

DURING THE SUMMER OF 2010, the California Department of Transportation (Caltrans) programmed a section of I-10 for rehabilitation that was in need of some much deserved repairs. This stretch of roadway, a major west to east Interstate highway in the southern United States, has experienced a great deal of traffic over its more than 40 years of existence. I-10 runs east from Santa Monica through Los Angeles and San Bernardino to the Arizona border. The rigid pavement was widened in earlier years to accommodate the increase in traffic demands and required rehabilitation. Surface spalls had appeared at random joints and other surface defects were identified in the east-bound lanes near the Jackson Street exit. A pavement preservation method of surface repair, known as partial-depth repair (PDR), was chosen to address this pavement deterioration, since it did not extend through the entire concrete slab. This type of deterioration is likely caused by a number of factors such as late sawing, poor joint design, and inadequate joint/crack maintenance and material durability issues. PDR is an excellent preventative maintenance technique that is proven to last more than 20 years when properly constructed.

This project was repaired using a new product, *CeraTech D.O.T. Line rapid repair concrete*, which is an environmentally-friendly fly-ash based cementitious material made from waste by-products. Creating a finish similar to Portland cement based concrete, this material cleans up easily with water and is packaged pre-blended with aggregate. During the beginning stages of construction, diamond sawing of the perimeter followed by chipping was used to remove the deteriorated concrete. With a shallow vertical saw-cut approximately two to four inches deep performed around the perimeter of the spalled area, a 15 to 30 pound jackhammer was then used to remove the deteriorated concrete until sound concrete was exposed. The perimeter of the repair area needed to extend six inches into sound concrete, per Caltrans requirements, which resulted in an area rectangular in shape, deep enough to expose sound concrete, free of loose material and clean. With the majority of spalls next to a transverse or longitudinal joint, a foam board insert was placed in the existing joint, preventing the patch material from filling the joint and creating an incompressible condition. The foam board extended four inches beyond the patched area. The *CeraTech D.O.T. Line* product was mixed onsite, resulting in a concrete product with a four-inch slump and a 25-minute working time. After dampening the clean, chipped out spall area, the material was placed, screened off and finished with a trowel. The final surface texture applied to the patches was a broom texture.

Each 54-pound bag of patch material was mixed with two quarts of water for seven minutes, which the manufacturer says will result in a compressive strength of 2,500 psi in a maximum of two hours. This is considered the minimum strength to open to traffic. Workers operated at night by way of a lane closure.

According to Anna Hernandez, Area Supervisor and John Hubbs, Area Superintendent for Caltrans, they are encouraged by the new product and anxious to see how the material holds up with the summer heat in excess of 120 degrees Fahrenheit and the cool winters.

The total project value for the 179 repairs, covering approximately 13 miles, was $258,072. About 1,700 bags of material were used. The production schedule called for placing 300 bags of material per work shift, which enabled the workers to complete all of the spall repairs in just six nights. The overall success of this project resulted in improving ride quality and comfort for the traveling public, decreasing wear and tear on the pavement, and extending the pavement's service life.

TEAM MEMBERS

- CALTRANS (Owner)
- John M. Frank Construction (Prime contractor)
- CeraTech (Product supplier)